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Unofficial Economic Activities and Fiscal Discipline in Hungary as Mirrored in Consecutive Enterprise Surveys on Tax Behaviour

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UNOFFICIAL ECONOMIC ACTIVITIES AND FISCAL DISCIPLINE IN HUNGARY
AS MIRRORED IN CONSECUTIVE ENTERPRISE SURVEYS ON TAX BEHAVIOUR

BY ANDRÁS SEMJÉN AND ISTVÁN JÁNOS TÓTH

Abstract

The paper focuses on a segment of the hidden economy, i. e. on unofficial (unreported) economic activities of registered medium and large enterprises in Hungary. First we place the problem into a broader context, then we delimit those segments of unofficial economic activities our surveys are able to catch.

The data from our 1996,1998 and 2001 enterprise surveys put us into a unique position: we are able to analyse the dynamics of some components of the hidden economy during the transition. Our surveys focus on the everyday practice of tax evasion and tax avoidance (including some of the various methods and techniques enterprises use to diminish their tax liabilities). These methods include underreporting activities and revenues, exaggerating (over-reporting) costs, using outsourcing to small subcontractors in order to provide "tax-efficient" labour, tailor-made remuneration packages to take advantage of loopholes, etc. While some of the tax planning methods clearly remain within the realm of legality, others may include tax dodging of the illegal kind. The borderlines between avoidance and evasion are necessarily blurred. We also deal with some other aspects of fiscal discipline and tax compliance and enterprise behaviour (tax delays, tax litigation, etc .).

Our data unanimously support the hypothesis that the importance of unofficial economic activity of registered medium and large enterprises radically diminished since 1996. As we also have information about the selected enterprise group's opinion on the unofficial activities of their business partners and main domestic competitors, our data enable us to generalise this finding to the whole registered business sector.

SEMJÉN ANDRÁS – TÓTH ISTVÁN JÁNOS

A NEM BEVALLOTT (NEMHIVATALOS) GAZDASÁGI TEVÉKENYSÉGEK ÉS A FISKÁLIS FEGYELEM ALAKULÁSA MAGYARORSZÁGON
AZ ADÓZÁSI MAGATARTÁSRA VONATKOZÓ ISMÉTELT VÁLLALATI FELMÉRÉSEK TÜKRÉBEN

Összefoglaló

Az alábbi tanulmányban egy 2001 novemberében 300 közepes és nagy magyarországi cég körében lefolytatott vállalati empirikus vizsgálat eredményei alapján a vizsgálat vállalati körben a rejtett gazdaság súlyának és a cégek adózási magatartásának alakulását vizsgáljuk. A felvétel eredményeit összehasonlítjuk a megegyező mintán és módszerekkel 1996-ban és 1998-ban lefolytatott vizsgálatok eredményeivel.

Kimutatjuk, hogy érezhetően javult a közepes és nagy cégek adózási fegyelme 1998 és 2001 között, valamint jelentősen csökkent e cégek körében a rejtett gazdaság különböző megnyilvánulásainak súlya és elterjedtsége. Ez a tendencia egyrészt illeszkedik korábbi kutatásaink által kimutatott – az 1994 és 1998 közötti időszakra vonatkozó – folyamatokba, másrészt aláhúzza azon empirikus és elméleti eredmények érvényességét, amelyek szerint a poszt-kommunista országokban a transzformációs visszaesés lezáródásával csökkenni kezdett a rejtett gazdaság – korábban növekvő – súlya. Véleményünk szerint ezt a folyamatot a kedvező konjunkturális kilátások, a vállalati szférán belül a külföldi tőke térhódítása, a vállalatok üzleti kapcsolatainak átalakulása, valamint a kormányzati szabályozási hibák ritkulása és az adóigazgatás ellenőrzési hatékonyságának növekedése segíti elő.

1. INTRODUCTION

This paper focuses on a segment of the underground or *black economy*, i. e. on *unofficial (unreported) economic activities of enterprises in Hungary*. Our aim was to observe and present some changes in the share of an important segment of the black economy over time. There are many possible ways to do this (econometric analysis using existing statistical data, empirical testing of theoretical models, field work, survey, etc.) Here we are going to present some survey data from three consecutive surveys. Other approaches can certainly be as useful as this one. and perhaps far more elegant. However, we believe that survey data may present the researcher with such wealth of empirical information and evidence that is hardly available form other sources, making this approach useful and rewarding.
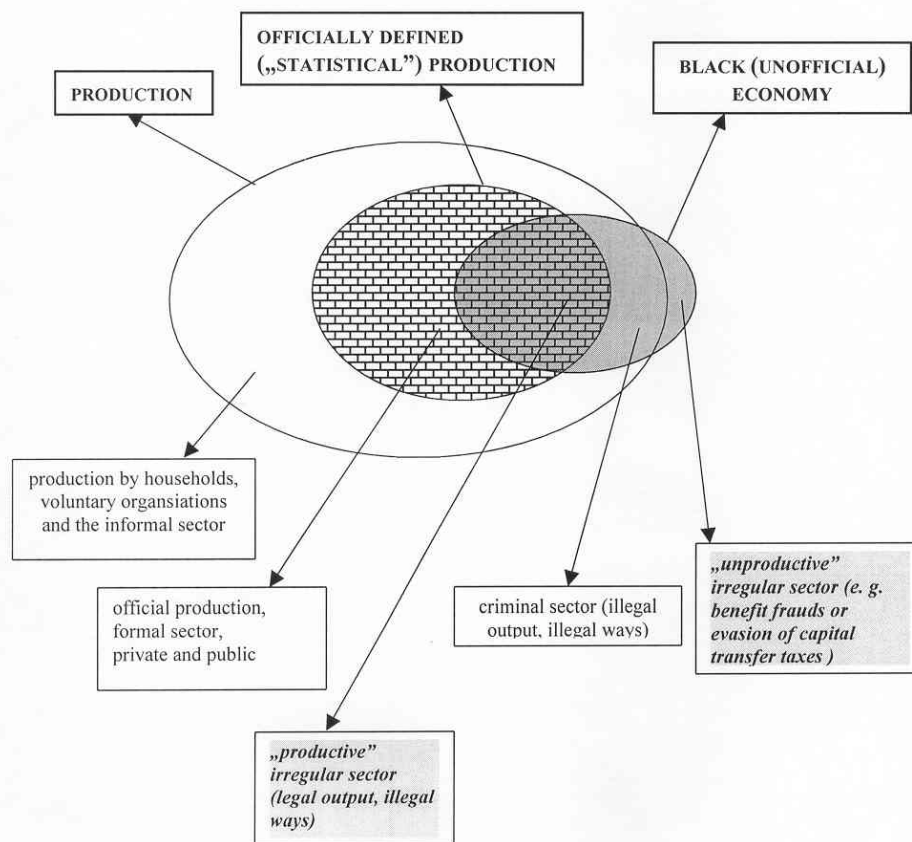
First let us place the problem of unofficial economic activities or the concept of the black economy into a broader context. This might prove useful, as it can help us in delimiting those segments of unofficial economic activities our surveys and analysis are able to catch.. Many of the terms used below in Figure 1 (and throughout the paper) may seem to the reader somewhat vague and/or overlapping, and different authors may use them with slightly different meaning. We mostly use here these terms in accordance with the definitions given in Thomas, 1992. We have only very little space here to go into details regarding the definition and measurement of the main concepts, however, some clarification is certainly needed to justify our distinctions between economic transactions or sectors characterised to a lesser or greater extent by some degree of informality, irregularity or even illegality.

The following clarification covers only the main concepts depicted in Figure 1. The important characteristic of the *household sector* is that its output is produced and distributed within the household and not traded on the market. The lack of market transactions make it difficult to evaluate its contribution to welfare and so it is mostly excluded from national accounts (or at best only partially imputed). Voluntary organisations (like some clubs) also may be involved in activities that might constitute production although not traded in the market. These also do not fall inside the "official" production boundary and are mostly left out from the national accounts. The concept of the *informal sector* is "an artifice of accounting convention" (Cowell, 1990, p. 13): it includes some kind of household production and some barter transactions; it encompasses small-scale pro-

duction in the traditional sector. Though the output of the informal sector is sold (on the streets) or barter-traded, and there is no theoretical reason why its output should not be included in "official production" or the national accounts, it is largely ignored due to the difficulties of data collection. Although the goods and services forming the output of the *irregular sector* are perfectly legal, the way these are produces and/or distributed always involves some level of illegality (like tax evasion; avoidance of some regulations, especially minimum wage and factory safety regulations; social security fraud). The usual intention of authorities regarding this sector is to include it in the regular sector, thus stop the fraud and collect the unpaid taxes. This makes it completely different . from the *criminal sector* which consists of activities (goods and services) leading to illegal outputs (e.g. theft, drugs, burglary, kidnap, blackmail, in some countries prostitution). The authorities usually want to stop or curtail such activities and are not interested in including them in the tax base.

Figure 1

Scope of the black economy: some economic concepts relevant for understanding unofficial economic activities

Note: This rough schematic description is based on *Figure 2.1* of Cowell, 1990. For the definition of terms used here see also Thomas, 1992.

From the three different subsets of black economy displayed in *Figure 1* we are going to limit ourselves in the following to two only, namely some part of the *productive irregular sector* (irregular economic activities of registered firms) and to a far more limited extent to some phenomena belonging to the "*unproductive" irregular sector*. (Parts to be dealt with here are set in cursive in *Figure 1*) We are not going to deal with the unofficial economic activities of *unregistered* economic agents. We will not deal with the criminal sector, i. e. the economic aspects of "ordinary" criminal activities[1] (e.g. smuggling, drug trafficking, etc.) either. However, our analysis may include *some* (but not all) *illegal activities* (belonging to the "irregular sector" according to Thomas's categorisation) that have detrimental effects on public property or public revenues. Such activities do not belong to the criminal sector as their output in itself is completely legal, however, these activities may still belong to the realm of criminal law (e.g. tax evasion). For technical reasons (in order to keep sample sizes reasonably small) we will also exclude firms below a certain size or sole proprietorships from our analysis: we will deal with *large and medium-size* firms only.

Our enterprise surveys focus on the everyday practice of tax evasion and tax avoidance (including some of the various methods and techniques enterprises use to diminish their tax liabilities). These methods include underreporting activities and revenues, exaggerating (over-reporting) costs, using outsourcing to small subcontractors in order to provide "tax-efficient" labour, tailor-made remuneration packages to take advantage of tax loopholes, etc. While some of the tax planning methods clearly remain within the realm of legality, others may include tax dodging of the illegal kind. The borderlines between avoidance and evasion are necessarily blurred. We also deal with some other aspects of fiscal discipline and tax compliance (tax delays, tax litigation, etc .). The data from our 1996,1998 and 2001 enterprise surveys have put us into a unique position: we are able to analyse the dynamics of some components of the underground economy during the transition.

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[1] Activities with illegal output, or activities threatening the life, safety, freedom or property rights of individuals.

1. THE SAMPLE

Our 2001 November survey was already the third one in a row of enterprise surveys investigating registered medium-size and large businesses in Hungary. These surveys focused on the tax behaviour of medium-size and large enterprises, and tried to identify and analyse the main factors determining enterprise behaviour in this respect. The first survey took place in 1996 November, while the second one in 1998 June[2]. The sampling guidelines for all three surveys were basically the same, so our survey data are characterised by a level of homogeneity enabling us to analyse the dynamics of tax behaviour and thus investigate some components of the underground economy during the transition.

Our guiding principle in sample selection for the 2001 survey was our aim to retain the possibility of comparison with our earlier (1996 and 1998) enterprise surveys, to cover a wide range of economic sectors and to get information on the behaviour of enterprises that belong to the most important segment of the Hungarian economy (large and medium-size enterprises).

We used random samples for all of our three surveys. Enterprise addresses for the 2001 survey were obtained from the Hungarian Central Statistical Office (KSH), similarly to the practice followed in earlier surveys. The main parameters of our survey samples are compared in *Table 1* below.

The relevant enterprise population[3] for the 2001 survey consisted of 3458 enterprises, out of which the list of enterprises to be interviewed was selected by random sampling. The distribution of the enterprise population and the sample is presented in *Table 2* (by number of employees and sector). The test of goodness of fit (See *Appendix 1*) shows that the joint distribution of the survey sample by sector and the number of employees does not differ significantly from that of the whole enterprise population, thus no weighing was necessary. The sample can be considered representative by sector and the number of employees.

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[2] Questioning and the collection and processing of survey data was done by the personnel of the Survey department of a Budapest based social research institute specialising in opinion polls and surveys (TÁRKI).

[3] Enterprises meeting our selection criteria, i. e. size (as measured by the number of employees) and sector, are the relevant cases.

Main parameters of the three survey samples

Time of survey	1996 November	1998 June	2001 November
Sectors covered	Manufacturing Construction Trade and commerce	Manufacturing Construction Trade and commerce	Manufacturing Construction Trade and commerce
Size (number of employees)	above 50 employees	above 50 employees	above 50 employees
Enterprise population	1721	3494	3458
Number of cases	293	300	301
Weighing Place of residence of enterprises	Not needed Budapest and county capitols	Not needed Whole country	Not needed Whole country
Fit (Representativeness)	Sector & number of employees	Sector & number of employees	Sector & number of employees

If one compares the 1996, 1998 and 2001 survey samples by ownership types, there is a salient feature in the ownership structure that catches the eye. Foreign ownership visibly gained ground during these years in the ownership structure of the Hungarian economy: the share of firms in (sole or majority) foreign ownership[4] within the sample increased significantly. Parallel with the spreading of foreign ownership the share of domestic public (central or local government) owners and domestic corporate owners lost ground in the Hungarian ownership structure. Firms with (at least majority) foreign owners play a major role in determining the performance of the Hungarian economy: their share in total net sales or in export sales

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[4] That means firms registered in Hungary and either exclusively owned by foreign individual and/or corporate owner(s), or in which the foreign individual and/or corporate owner(s) have an ownership share above 50 percent. Strictly speaking when we mention majority owners or ownership in the paper we should rather say "sole or majority" or "at least majority" owner(s) or ownership throughout the text. However, for the sake of simplicity and brevity we will frequently use only majority (domestic or foreign) owner(s)/ownership or even more simply and plainly just (foreign or domestic) owner(s)/ownership.

are well beyond their relative share amongst registered firms. In the 2001 sample firms owned by (at least majority) foreign owners (for the sake of simplicity referred to as foreign owned firms) count for 33 percent of total net sales and 58 percent of exports (See *Table 3*.).

<div align="right">*Table 2*</div>

**The distribution of the relevant enterprise population
by the number of employees and sector, %**

	Enterprise population meeting selection criteria	Enterprises in the sample
Sectors (2 digit NACE codes)		
Food, beverages and tobacco industries (15,16)	10,8	8,3
Textile, clothes, leather and fur manufacturing (17-19)	14,5	14,6
Wood, paper, printing industries (20-22)	6,2	5,6
Chemical industry (23-25)	6,7	4,7
Manufacturing of non-metallic mineral products (26)	3,1	4,0
Metallurgy and metal procession (27,28)	9,2	7,6
Machine industry/engineering (29-35)	16,5	19,9
Other manufacturing, recycling (36,37)	3,1	3,7
Construction (45)	11,4	13,0
Trade and commerce (51,52)	18,6	18,6
Total	100,0	100,0
Employment (number of employees)		
51-99	49,1	46,2
100 – 249	31,0	32,1
more than 249	19,9	22,6
Total	100,0	100,0
N	3458	301

Figure 2

Some changes in the ownership pattern of medium-size and large companies in selected sectors of the Hungarian economy, 1996-2001, based on the type of (at least) majority owner(s), percent
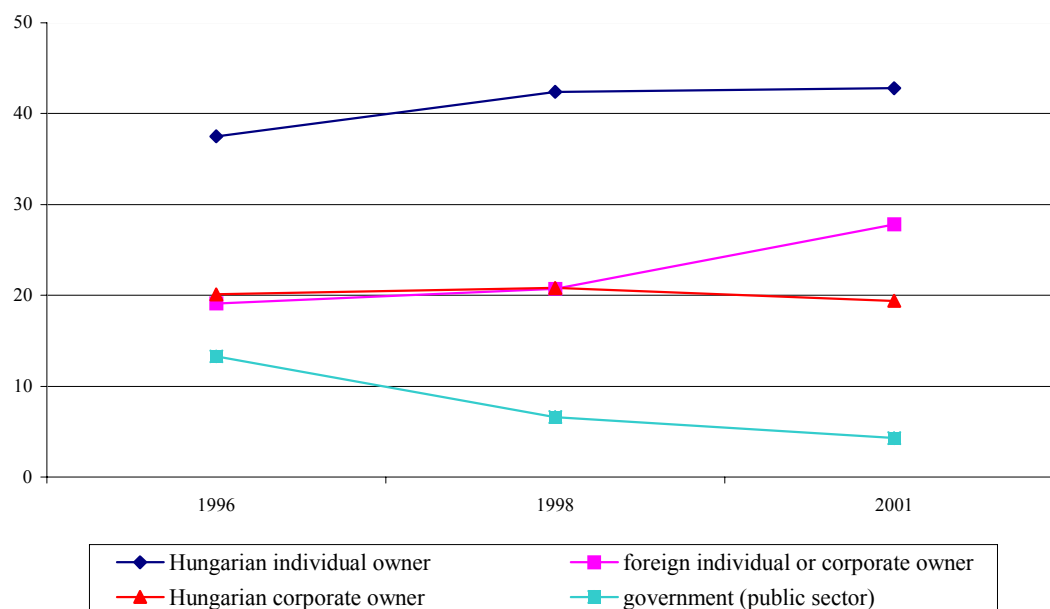

- Hungarian individual owner
- Hungarian corporate owner
- foreign individual or corporate owner
- government (public sector)

Table 3

Share of foreign owned firms* in (expected) net sales, exports and employment, 2001, percent

	All firms in the sample	N	Foreign owned firms* in the sample	N	Percentage share of foreign owned firms*
Net sales (thousand HUF)	697.3	293	231.5	78	33.2
Export revenues (thousand HUF)	200.2	194	115.5	67	57.7
Number of employees (thousand)	74.1	295	19.7	80	26.6

Based on firms' expectations in November 2001
* firms in majority or sole foreign ownership

Another salient feature of the economic trends represented in our three subsequent surveys is the significant increase in the importance of export markets. This is reflected in the share of firms producing for exports in the 1996–2001 period as well as in the overall share of export revenues in total net sales. Companies within the surveyed part of the economy visibly became more and more open and exposed to the world market: the share of firms producing for export increased from its 55 percent 1996 level to 65 percent by 2001; while during the same time span the average share of export sales (revenues) in total net sales of firms producing for export increased from 34 percent even more markedly, to 48 percent.

2. SURVEY RESULTS

2.1. Business climate and prospects

Already back in 1998 it was obvious from the analysis of survey data that enterprises felt a significant improvement of the business climate in general. And indeed, the economic growth in Hungary was at a local peak in the second quarter of 1998 with a remarkably high 5.4 percent growth rate (Cf. *Figure 4*). That was also reflected in the high level of the interviewed firms' subjective assessment of their business position, expectations and

Figure 3

Share of firms with export sales in the sample and the ratio
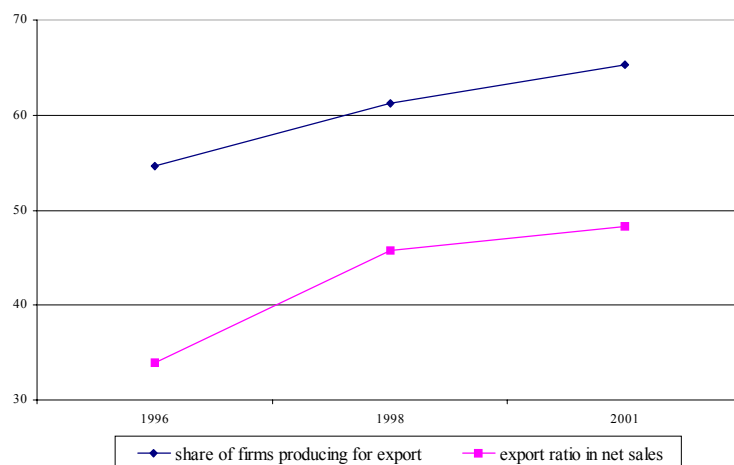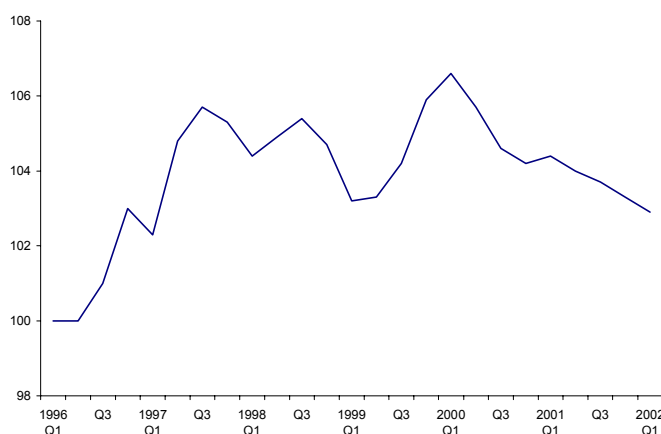**of their export revenues to their total net sales, 1996-2001,** percent

Figure 4

Quarterly GDP growth rates for Hungary, 1996-2002
(same quarter of previous year = 100 percent)

prospects, as compared to the same indicators in 1996. Investment activity became more robust and the time horizon of company planning increased significantly, and company balance-sheets also improved a lot during this two year. In the 2001 November survey, however, expectations and opinions of company executives on their business situation and prospects suggest a somewhat more restrained attitude, although on the whole executives are still far more pleased with their business situation and optimistic about their business prospects than they were back in 1996. No wonder, as from the 2nd quarter of 2000 onwards quarterly growth rates have shown a monotonously decreasing pattern. These economic trends surely must have been reflected in the subjective indicators of business position and prospects.(See *Table 4.)*

In an earlier paper (Tóth and Semjén, 1998) we substantiated that the shift from recession or stagnation to positive economic growth and, parallel with this shift, more favourable expectations about macroeconomic prospects, were instrumental in diminishing the share of *unofficial economic activities* (or, as such activities are frequently referred to, the *hidden economy*). This, however, in no way indicates that once macroeconomic trends and prospects start to deteriorate, there must be an *automatic* increase in the share of the hidden economy.

Table 4

**Changes in expectations and opinions on business climate
and some performance indicators, 1996-2001,** percent

	1996	1998	2001
Expectations on investment dynamics			
Increase	19.5	44.7	32.8
No change	49.8	34.8	46.8
Decrease	30.7	20.4	20.4
Total	100.0	100.0	100.0
N	277	296	299
Operating balance forecasts for the year of the survey			
Profit	65.4	82.1	80.0
Zero balance	5.5	2.7	12.0
Loss	29.1	15.2	8.0
Total	100.0	100.0	100.0
N	289	295	300
Time horizont of business planning			
No plans	1.7	1.7	1.7
Less than 12 months	8.3	3.9	6.0
1-2 years	36.1	30.7	39.5
3-5 years	28.8	31.5	25.2
More than 5 years	25.0	32.2	27.6
Total	100.0	100.0	100.0
N	288	297	301
Incidence of export sales			
Yes	54.6	61.2	65.3
No	45.4	38.8	34.7
Total	100.0	100.0	100.0
N	293	300	291
Share of export revenues in net sales*			
Export ratio	33.9	45.8	48.3
N	159	178	190

* Only for companies with export sales

Although there has obviously been a marked deterioration in the growth performance of the Hungarian economy in 2000–2001, economic growth only slowed down somewhat but always persisted. The deterioration of growth rates that started around mid-2000 was, on the one hand, not dramatic enough to change the long-term expectations of economic actors

overnight, and on the other hand it was perceived by many economic actors as a temporary phenomenon mostly due to some passing recession in our main export markets or fluctuations in the business cycle. Thus it may seem rational to expect that the deterioration of the growth rate will come to a halt soon and then the economy will flourish again, returning to a somewhat higher and more stable growth rate. And this is far from being the only reason that can account for the lack of any necessary automatic response to business climate deterioration, as far as financial discipline or the relative share of unofficial activities are concerned. It is more than obvious that such institutional factors as legal and/or administrative changes in the tax system or tax administration[5] do have a significant impact on the share of unofficial economic activities, and can compensate for some unfavourable changes in business climate.

Thus changes in survey data for the 1998–2001 period cannot be expected to indicate definitively any increase in the share of unofficial activities within the economy, although such conclusion cannot be ruled out *a priori*. However, in some fields or aspects that are more sensitive or vulnerable to short-term fluctuations in the business cycle there can be some negative effects due to the slowdown.

2.2. Tax compliance and contractual discipline

The 2001 survey data on tax compliance or tax discipline seem to support our previous hypothesis (that the economic slowdown may have some negative effects on enterprise behaviour regarding the choice between official and unofficial or reported and unreported economic activities, or the punctuality of tax payments) to a certain extent. Although the gradual improvement of contractual discipline[6] amongst large and medium-size com-
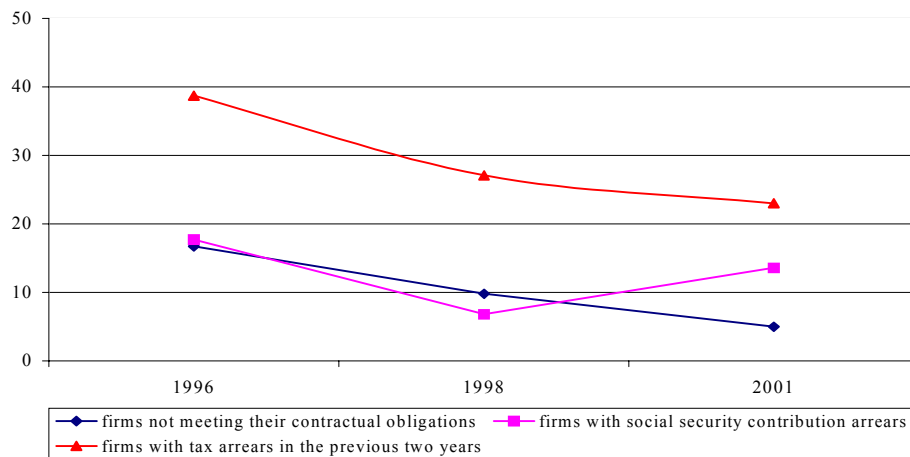
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[5] Such changes in Hungary are analysed at length in Semjén, 2001

[6] Contractual discipline covers the discipline of payments and delivery. Here we mostly concentrate on the discipline of payments. The discipline of delivery also shows an improving trend, however, its 2001 level is far below the level of discipline of payments. The share of firms reporting problems in meeting their delivery deadlines during the last 12 months is quite high: more than one fifth (22 percent) of firms delivered with some delay and 2 percent did not deliver overdue items by the time of the survey. Out of those firms that reported such problems during the last 12 months, 65 percent delivered with delays less than ten times, and 39 percent less than three times.

panies remained steadfast (the share of firms *not meeting* their contractual payment obligations diminished steadily[7] at a nearly constant rate during the whole 1996–220 period), and the positive trend (visible improvement) also persisted in tax discipline, i. e. there is a decrease in the share of firms with delays in tax payments (freshly accumulated tax arrears), and other indicators[8] also show some improvement in tax compliance), the slope of the line is somewhat broken, the speed of change is visibly smaller after 1998. (See *Figure 5.)*

Figure 5

Share of firms not meeting their contractual payment obligations and firms with recently accumulated tax or social security contribution arrears, 1996-2001, percent

Note: Firms with (freshly accumulated) tax arrears in the previous two years data for 2001 also contain firms with social security arrears in the previous two years. If the relevant 2001 data were fully comparable with earlier ones the improvement in tax compliance might have been somewhat more pronounced than it appears here.

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[7] By 2001 the share of firms not always meeting their contractual payment obligations during the last 12 months fell drastically from its 17 percent level that prevailed in 1996 to 5 percent. (See the lowest line in *Figure 5*.) Although it can be the case that some company executives reporting full compliance with contractual payment obligations had a memory lapse or wanted to make a better impact by not remembering late payments and arrears, the general trend must be still valid as we have no reason to believe that the tendency of executives to underreport late payments increased over time.

[8] Some of these will be analysed in Chapter 2.3.. Our survey data also contain some other indicators signalling the incidence of different tax evasion and avoidance techniques that are not analysed here for the sake of brevity, although they show a similar pattern.

Somewhat paradoxically, the punctuality of social security payments, that was improving between 1996 and 1998, later showed a marked deterioration. as the share of firms with "fresh" social security contribution arrears (delays in the payment of contribution over the last 12 months) increased somewhat in the 1998–2001 period, in spite of the fact that the collection of these contribution was delegated to the tax authority in this period (this institutional change was expected to result in better and more efficient collection).

Delays in the payment of social security contributions (or payroll tax arrears) are less common for companies with (sole or majority) foreign owners then for the rest of the sample (the relevant incidence is 6.1 percent for foreign owned firms as compared to 13.8 in the whole sample) Fiscal discipline in general (approximated here by the punctuality of tax and social security contribution payments taken together) also seems to be better for foreign owned firms in 2001 than the average; at the same time smaller firms (companies with less then 100 employees) tend to perform less well in this respect then the big ones. These results are in line with theoretical expectations and earlier surveys; however, none of these relationships seem to be truly significant statistically in the 2001 sample.

We can combine a *subset* of *contractual discipline* (discipline in contractual *payment obligations* to other firms) with the concept of *fiscal discipline* (discipline in tax and social security contribution payments, i. e. payment obligations to government or to the public), and thus we can create a broader concept that can be called the *discipline of payments* or *financial discipline*[9]. We can create a dummy (BFD01) in order to measure financial discipline or rather the infringement of the discipline of payments. This dummy can take only two values:

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[9] The term „financial discipline" was used in a similar sense by Kornai, 1993 Kornai used a concept, imprinting, borrowed from evolutionary biology as a metaphor, when he claimed that the rules of financial discipline must be imprinted in newly emerging private firms. „It is most important for the new private firms to learn from the outset that they must observe the rules of financial discipline strictly" (Cf. Kornai, 1993, p. 330). Tóth and Semjén, 1996 was the first paper to test empirically "whether the undeniable improvement in the discipline of payments in market relations goes together with a parallel improvement of tax abidance" (or fiscal discipline), and the same issue was also dealt with in Tóth and Semjén, 1998.

BFD01 = 1,

>if the company could not *always* meet in due time its *payment obligations to other companies* during the last 12 months,
>
>OR
>
>if it ever had any *delay* in its *social security contribution payments ("fresh" s. s. p. arrears)* over this time span
>
>OR
>
>if it ever had "fresh" *tax arrears* (delays or debts in paying VAT, corporate income tax, local taxes, etc.)over this time span

BFD01 = 0 otherwise.

If we use this dummy to characterise the overall financial discipline in the subset of the Hungarian economy represented by our survey sample, we can conclude that 46.5 percent of companies broke some or all of the rules of discipline of payments to some extent over the previous 12 months.[10] This seems quite high and may indicate that something must have gone wrong in the process of "imprinting" of financial discipline into private companies[11] in post-socialist Hungary (Cf. Kornai, 2001 for a more disillusioned view). However, if we look at Figure 5 or the underlying data in *Table A2.3* of the Appendix more closely, we can conclude that the discipline of contractual payment obligations improved impressively over time, and such obligations are relatively very rarely broken according to the 2001 survey data, thus so far Kornai's view seems to be supported by this evidence. On the other hand our data concerning fiscal discipline might tell a somewhat different story[12]. Although there was a marked im-

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[10] A word of caution seems certainly warranted here. We must not forget that this dummy is a rather rough indicator only: it certainly shows the incidence of the infringements of financial discipline, as far as the number of its occurrence is concerned, but it contains absolutely no information on the intensity of these infringements, or on the average level of financial discipline for those firms who were not fully compliant with our concept regarding the discipline of payments. Any minor infringement of absolute compliance with payment deadlines, whatever marginal or temporary it may be, has the same detrimental impact on the level of this rough indicator as a large-scale infringement of financial discipline in all territories (private contracts, tax obligations, social security obligations).

[11] See footnote 9 above, and Kornai, 1993, p. 330.

[12] We challenged Kornai's view on the role of private ownership in strengthening financial discipline in our 1996 paper (Tóth and Semjén, 1996), at least partially, regard-

provement in tax discipline over the 1996-2001 period, and a rather moderate improvement could be observed for social security payment arrears as well (if we presume that the deterioration observed in the second part of this period is of temporary nature only), the incidence of the infringement of fiscal discipline (or breaking payment obligations to government) seems to be on a relatively high level even as late as in 2001.

Our 2001 survey results strengthen our earlier findings (cf. Tóth and Semjén, 1996 and 1998) regarding the positive correlation between (sole or majority) foreign ownership and financial discipline. Companies with at least a majority foreign stake perform significantly better in this respect than companies with "domestic" owners. While some infringement of financial discipline could be observed in 60.3 percent of companies having domestic companies as their exclusive or majority owners, and instances of such infringements were also found nearly in every second company (48.8 percent is the rate of incidence) owned exclusively or with a majority stake by domestic individuals, in the case of "foreign" firms (companies with at least a majority foreign stake) the relevant relative incidence is only 33.7 percent. Infringement of payment obligations was more prevalent amongst companies in the construction sector (66.7 percent) than in manufacturing or in trade and commerce (the relative rates are 42.9 and 46.4 percents, respectively. There is also some correlation between company size and financial discipline: bigger firms tend to perform better in this respect than the smaller ones. 53 percent of firms with less than 100 employees did not comply fully with the strict rules of financial discipline.

2.3. Involvement of registered enterprises in the black economy

In order to catch involvement or participation in the black economy we had to use some indirect questions and some rather sophisticated methods, as answers to direct questions regarding a firm's participation in the black economy would probably be seriously distorted. We approached this sensitive issue in three different ways: (i). we asked the opinion of company executives regarding the incidence of some phenomena in the economy that indicate participation in the black economy;.(ii) we also asked some direct questions regarding the incidence of contracting out (the substitution

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ing *tax discipline*. We were of the view that private ownership does not necessarily strengthen financial discipline *automatically* as far as fiscal discipline or tax discipline are also taken into consideration. Actually we went as far as to venture that „it can probably be presumed that … private ownership in certain cases even weakens tax discipline".

of subcontractors' contracts for employment contracts) as this completely legal method of tax planning or tax avoidance may indicates some forms of tax evasion for the subcontractors[13] ; (iii) and finally we also used a survey method (the so called randomised response technique) specially designed for estimating the incidence of sensitive or "delicate" phenomena. This method allowed us to get a direct overall estimation on the incidence of tax evasion for our enterprise population.

We asked company executives about their opinion on the incidence of unreported sales (a) amongst their contractual business partners; (b) amongst their domestic competitors, and (c) in the Hungarian economy as a whole. There is an important difference between answers to these seemingly so similar questions: while answers to question (c) are necessarily based on some general social perceptions and stereotyping and should be assessed with caution, answers to questions (a) and (b) are far more reliable as these can be based on the personal experience of company executives the firms regarding the behaviour of some other economic actors they know personally and more directly from the everyday practice of their business. Despite this basic theoretical difference we cannot expect answers to (a) or (b) to be completely accurate or even honest[14]. Although

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[13] The primary benefit of this popular and seemingly entirely legal tax planning method for the company initiating the substitution of suppliers' (sub)contracts for some of its previous employment contracts lies in the *reduction of total labour costs* by cutting the "social security contributions bill" of the initiating firm. However, the shift to subcontracting from employment would not be an attractive choice for employees unless they could easily *evade* some of their taxes and social security contributions by over-reporting material costs and underreporting their own wage costs.

[14] Since company executives tend to estimate the incidence of unreported sales amongst their contractual partners (suppliers) well below the respective levels of their estimations regarding the incidence of such sales for their competitors or the economy as a whole, one can suspect systematic distortions in their answers. We cannot exactly tell whether this distortion is intentional or subconscious. One can argue that this distortion may be due to the executives' efforts to save the reputation of their own firms (we cannot expect them to report a high incidence of unreported sales amongst their suppliers, as this could be taken as indirect or circumstantial evidence on their own willingness to buy unreportedly); on the other hand it can also be the case that this distortion just reflects the fact that their knowledge on competitors' behaviour is vague and indirect as compared to their knowledge on their suppliers' behaviour, and thus "general" stereotypes may influence their answers on competitors, while answers regarding suppliers they directly know may be less susceptible to such stereotyping.

answers to such questions regarding opinions are "soft indicators" even at their best, changes in such soft indicators over time may carry important and valid information regarding the actual process.
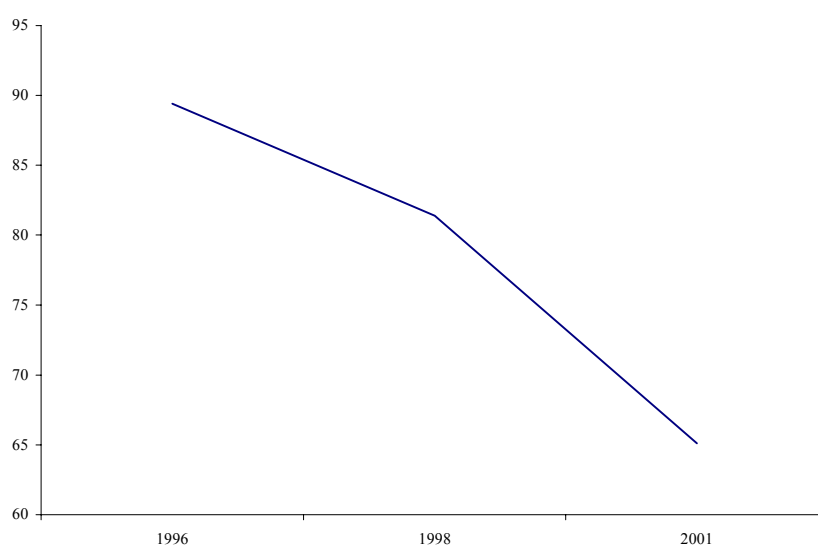
Soft "opinion-type" indicators as well as indirect indicators (that could be used to create circumstantial evidence) substantiate unanimously a significant decrease in the scope of unofficial economic activities for large and medium-size enterprises in Hungary over the 1996–2001 period.

Unreported sales became less and less prevalent over time in all three "reference groups", i. e. contractual partners (suppliers), competitors, and the economy as a whole. This trend is well documented in *Figures 6, 7* and 8 (the underlying data are presented in *Table A2.4* of the Appendix).

As far as opinions regarding the prevalence of involvement in the black economy *in general* are concerned, in 2001 a nearly 2/3 majority (65 percent) of company executives were still of the view that unreported sales are a frequent phenomenon in Hungary. This is certainly a relatively high figure, still it is way below its previously measured levels (81 percent in 1998 and 89 percent in 1996) that could be interpreted as indicating a nearly universal acceptance of a negative statement on Hungarian tax morale. (Cf. *Figure 6.*)

Figure 6

Incidence of unreported sales in the Hungarian economy: share of firms indicating the frequent occurrence of unreported sales in the economy as a whole[*], 1996-2001, percent
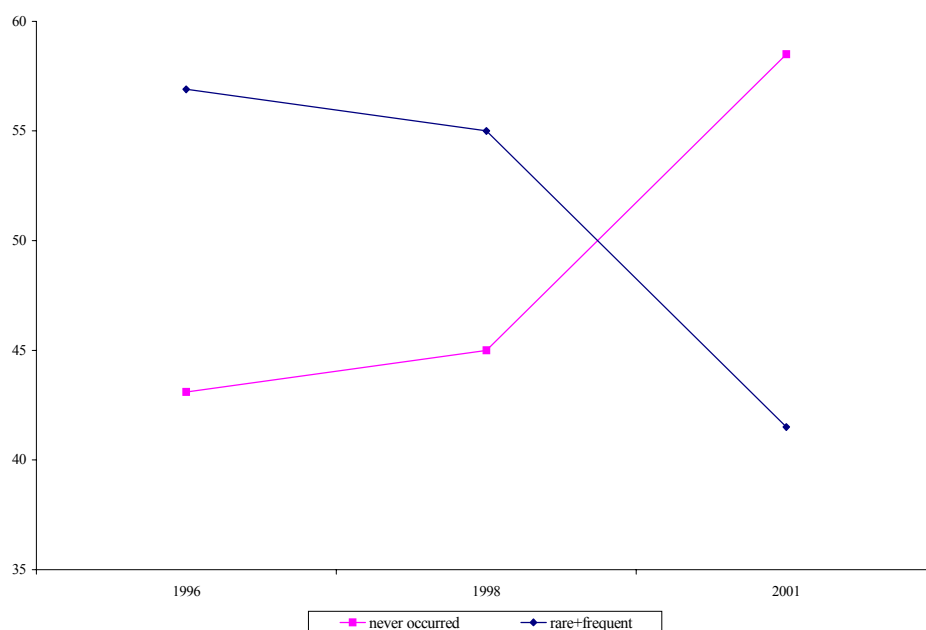

* Based on the opinion of company executives for large and medium-size enterprises in manufacturing, construction, trade and commerce.

Law abidance concerning the obligation of the seller to provide the purchaser with a proper receipt was considered more prevalent amongst the firms' domestic competitors than in the Hungarian economy in general. Although this feature was characteristic in all the three years investigated, there was also a gradual improvement in this respect as well. While in 1996 only 43 percent of respondents were of the view that unreported sales never occur amongst their domestic competitors (cf. *Figure 7*), this share was already a bit up to 45 percent in 1998 and by 2001 it grew to 58.5 percent. Parallel with this strengthening of compliance, the share of "frequent" answers (indicating the frequent occurrence of such sales) amongst competitors fell to 21.2 percent from 33.3 percent over the same time span.

Figure 7

Subjective* incidence of unreported sales amongst the competitors of the interviewed firms: the total share of „rare" and "frequent" answers contrasted to "never occurred" answers, 1996-2001, percent

* As perceived and assessed by the interviewed company executives.

At the same time the incidence of unreported sales amongst contractual partners[15] (mainly suppliers) is estimated at relatively low levels in any

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[15] Contractual partners in general can be suppliers (including factor owners), subcontractors and customers. As firms have little direct experience concerning the behaviour of their customers in this respect, this indicator must mainly refer to suppliers and subcontractors

given year. As the difference between incidence data for competitors and contractual partners is rather high, we have good reason to believe that there is a systematic distortion in the answers. (See more about this in footnote 13). However, the important thing here is again not the actual share of any given answer to this question but the tendency over time. And this tendency shows an improvement over time, similarly to the tendencies observed for competitors or the economy as a whole.

Figure 8

Subjective[*] incidence of unreported sales amongst the contractual partners[**] of the interviewed firms: the total share of „rare" and "frequent" answers contrasted to "never occurred" answers, 1994[***] -2001, percent

Note: Right-hand scale = "never occurred" answers
      Left-hand scale = "rare" + "frequent" answers

*   As perceived and assessed by the interviewed company executives.
**   Contractual partners here mostly mean suppliers and subcontractors..
*** 1994 data are from an empirical survey (see in McLure Jr. et al., 1995, pp 20-82.) conducted by the same authors on a sample referring to a somewhat different enterprise population (focussing on smaller and medium enterprises) from that of the three subsequent surveys. Thus – strictly speaking – the 1994 data are not fully comparable with data from our later surveys; however we believe that despite this fact it they are worth to include here in this figure. More rigorous readers should neglect the 1994 data.)
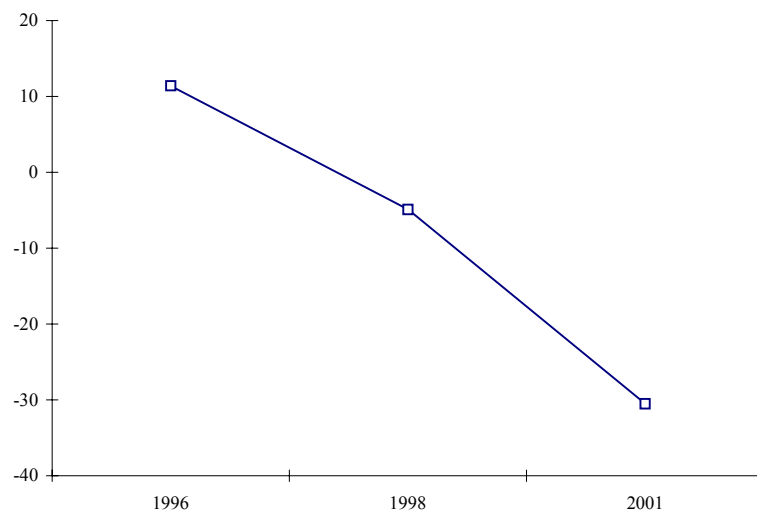
As it could be observed earlier in the field of financial and fiscal discipline firms with foreign owners tend to perform better than the rest as far as involvement in the black economy or unreported sales are considered. While 21 percent of all company executives found unreported sales a fre-

quent phenomenon amongst their competitors, only 9 percent of foreign company executives agreed with this view. There are also significant differences between different sectors in this respect: Unreported sales seem to be the most frequent amongst the competitors of companies in trade and commerce. The estimated 39 percent share of such sales for companies in commerce and trade indicates that this phenomenon is far more likely to occur in this sector than in manufacturing or construction.

The general perception of an improved tax compliance and the underlying decrease of unreported sales (or the involvement in the black economy in general) that can be at least rendered likely on the basis of the above displayed data on the subjective incidence of such sales in different subsets of enterprises is also reflected in the firms' perception of the damage (or detrimental effects in their competitive position) due to their competitors' involvement in the black economy. Compared with earlier data there is a significant decrease in the share of those firms complaining about the detrimental effects of their competitors' involvement in the black economy either as sellers or as buyers. (Cf. *Figure 9.*). Companies with at least a majority foreign stake tend to perceive the threat caused by the involvement of their competitors in the black economy less dangerous than companies with domestic owners. While 63 percent of companies with (at least majority) foreign owners were of the opinion that their competitive position is altogether unaffected by any such involvement, only 41 percent of companies owned by domestic owners shared a similar view.

Figure 9

The impact of the competitors' involvement in the black economy on the market position of the interviewed firms, percent

Note: The line shows a "balance-type" statistics, i. e. the difference between the respective shares of "significant influence" and " no influence at all" answers.

Similarly to our earlier surveys we also used the so called *randomised response technique* to estimate the share of tax evading firms in the sample and for the selected enterprise population. According to our estimation based on this method the share of tax evading firms in the selected enterprise population must not exceed 16.6 percent at the required 95 percent level of significance. (See *Appendix 3* for technical details.) For 1998 the mean share of tax evading firms was estimated at 8.8 percent, and the (0, 22.8) interval was estimated as the possible percentage range for the share of tax evading firms at a 95 percent level of significance. For 2001 we estimated a much smaller, 2.5 percent mean and a 14.1 percent variance (nearly identical with the 14 percent variance estimated for 1998). These estimations indicate a (0;16.6) interval for the relevant percentage range of evading firms at the given level of significance. This means that the upper limit of the estimated range for the share of evading firms decreased substantially over the 1998-2001 period. Although such a downward shift in the mean and the upper limit of the range does not allow us to exclude the possibility of an actual increase in the incidence of tax evasion in the selected enterprise population with certainty, a decrease seems to be far more likely and consistent with the given results.

Based on these results we may conclude that changes in corporate opinions regarding the incidence of unreported sales or involvement in the black economy are realistic and correspond to similar changes in the real economic process. Thus our survey results are consistent with some decrease in the level of involvement of registered large and medium-size enterprises in the black economy over the 1996–2001 period. Not only the incidence of unreported sales diminished in the economy, but the impact of such sales on the market position of large and medium-size firms seems to have diminished as well. It seems to be plausible to interpret our results as empirical evidence supporting the hypothesis of a decrease in the relative share of unofficial economic activities.

2.4. Corporate opinions on tax system and tax administration

When making their decisions regarding tax compliance, avoidance or evasion and selecting their level of involvement in the black or hidden economy, companies take into consideration not only the actual and expected decisions of other economic actors regarding the same, but the actual and the expected future behaviour and attitude of the government towards the

hidden economy and tax administration as well. This means that in order to understand and describe the main trends and processes in tax compliance and unofficial economic activities it is not enough to detect some manifestations of the hidden economy, observe enterprise behaviour and record changes in fiscal and financial discipline, but the behaviour of the other actor (i. e. the government) must also be observed and analysed. by the researcher.
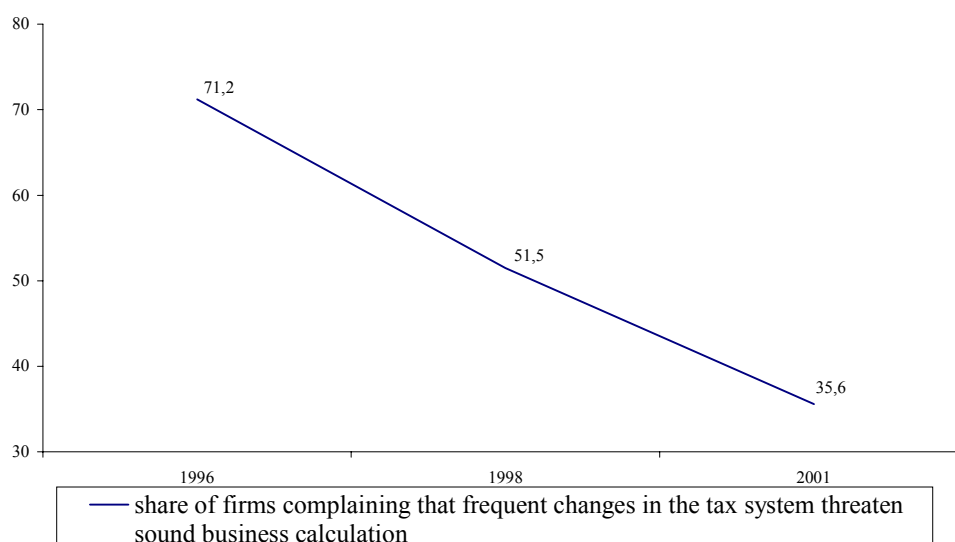
There are several ways this can be done. One is to give a thorough analysis of the government's tax policy and legislation, including the main types of taxes and the tax structure as a whole, give details on tax bases, tax rates, tax brackets, allowances, tax credits, tax breaks, etc. (such an approach was attempted in the chapter on Hungary in McLure et al, 1995 or Semjén, 1998 to name some examples) or another way is to attempt the empirical analysis of the tax administration itself (see Semjén, 2001 for this). A third and distinctively different way is to observe the corporate perception of the government's tax policy, to investigate enterprise opinion on the tax system and the working of tax administration. Our surveys allow us to elaborate somewhat this third approach. We asked several questions regarding the interviewed corporate executives' opinion about tax policy and tax administration. We also tried to ask details about their experience regarding the work of tax administration.

If we take a closer look at the survey results presented in the Appendix, we can conclude that according to company executives the stability and transparency of the Hungarian tax system improved a lot over time. While in 1996-ban only 3 percent of company executives thought that tax rules change only "when necessary", by 2001 this share grew to 13 percent, while the share of answers mentioning frequent changes decreased to a still substantial 86 percent form its 97 percent 1996 level. (See *Table A2.5* of the Appendix for further details.) As *Figure 10* demonstrates, the share of answers complaining that the extent of change of tax rules jeopardise the reliability of the company's business calculations diminished drastically (nearly by half, to 36 percent from 71 percent) over the recent years. However, although the main frameworks of the tax system show reasonable stability, and certain tax rates (corporate income tax, VAT) are also impressively steady, in our view it would be difficult to tell whether the changes of the tax rules indeed made the system less complicated, more comprehensible and transparent. The complexity of the rules seems to have increased. So we have to be cautious when interpreting the above opinion-type results: they *might* reflect some positive changes in the tax system, but they also might reflect more general changes in business climate and pros-

pects. Also there is probably a learning process behind these results: enterprises simply could get used to the logic, the rules and the rate of changes of a system that was considered overly complicated, difficult an unstable in an earlier phase of the development of the market economy and the institutional system in Hungary.

Figure 10

**The impact of changes in the tax system
on business calculations, 1996–2001,** percent

— share of firms complaining that frequent changes in the tax system threaten sound business calculation

Opinions on tax rules, tax legislation also show an improving trend. The share of answers finding tax legislation or tax forms overly complicated diminished significantly: while in 1996 still 76 percent of the respondents fully agreed with the first statement, and 57 percent with the second, by 2001 only a much lower percentage share (67 and 49 percent respectively) shared this views. (See *Table A2.6* of the Appendix for details.)

Opinions regarding the working of the tax authority also show some gradual improvement (see *Figure 11* below, and *Table A2.6.* of the Appendix for the underlying data). Already the majority of company executives agrees at least partially with the statement that tax authority informs businesses properly and in due time about their obligations (regarding deadlines of tax returns and tax payments, important changes etc.). Those definitely disagreeing with such a statement lost their majority (56 percent in 1996) somewhere between 1996 and 1998, and by 2001 the share of such answers diminished to 38 percent. The importance of personal contacts (an indirect indicator of the level of corruption) also seems to have diminished somewhat according to the answers. However, still a very high share of executives think that personal contacts do matter at the tax authority when

settling a tax dispute. The share of those fully agreeing with this statement decreased by 2001 to 42 percent (by 10 percentage points from its 52 percent level back in 1996), and although much of this decrease was absorbed by the share of those partially agreeing (finding some truth in it), the intensity of this opinion visibly diminished.

Figure 11

Opinions on the tax system and tax administration, 1996-2001, *percent*

Note: All lines show "balance-type" statistics (the difference between 'fully agrees' and 'definitely disagrees' answers)
Right-hand scale = the tax authority informs businesses properly and in due time;
Left-hand scale = extremely complicated…; difficult to understand…; personal contacts…;

These results indicate that the role of personal contacts (and, as a highly likely consequence of these, corruption)[16] is still rather significant, al-

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[16] The logic of sociological research in latent phenomena indicates that answers to the question on the role of personal contacts in tax disputes necessarily bear some direct consequence to the incidence of corruption in tax administration. This can only mean that those who have (good) personal contacts may expect better treatment or favouritism. The importance of such "personal contacts" can only be based in the long run on some level of reciprocity. Those who want to rely on their personal contacts cannot realistically expect selfless or altruistic behaviour from the other party, they must also provide some recompense in return. The scope of such recompenses or counter-

though probably less prevalent than 5-6 years ago. Such results do not imply that those emphasising the role of personal contacts in tax disputes necessarily based their opinion on their own personal experience or at least on direct second-hand information on any such evidence supporting the existence of corruption in the tax authority. However, even if rumours or hearsay might have played an important role in forming these views, the high level of acceptance of the importance of personal contacts indicate some existence of corruption in the broad sense (including reciprocal favours). Even if we suppose (completely hypothetically, just for the sake of making some simulation or sensitivity analysis) that only a relatively low 5 percent of those fully agreeing with the importance of personal contacts in tax disputes paid actually some bribe in order to get favourable results or better treatment from the tax authority, this implies that some 2 percent of large and medium-size enterprises was directly involved in bribery to secure special treatment from tax administration.- this would mean at least 70 enterprises in the selected sectors alone! Although it may be embarrassing to acknowledge that corruption exists within the tax authority[17] his may be, we still want to emphasise that even if these results can be interpreted as an indicator of corruption.

3. SOME CONCLUSIONS

Contractual fiscal and financial discipline all show visible improvement during the 1996-2001 years. All the *observed indicators of involvement in the underground economy show some* (sometimes substantial) *decrease in this involvement. According to the perception of the enterprises the incidence of unreported sales diminished* amongst their contractual partners and competitors as well (although enterprises tend to think that their contractual partners perform much better in this respect than their competitors), and it also decreases in the whole Hungarian economy. This decrease

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services may be very broad and varied, and might encompass minor favours within the family or between friends, small personal gifts, and monetary rewards related to corruption deals of a clearly illegal kind.

[17] In the interviews conducted in 2000 with tax administration personnel, including many people from the tax authority in important positions at local and national level, the existence of such corruption was hardly ever acknowledged, was always regarded as a marginal phenomenon. Corruption almost seemed to be a taboo topic for tax administrators (see Semjén, 2001) These interviews are in a striking contrast with corporate opinions.

went parallel with the *decrease of the negative influence of competitor firms' involvement in the black economy on the domestic competitiveness of the companies interviewed*. Our estimation based on the so called randomised response technique also suggests that a decrease has been likely in the share of tax evading firms as well. These results are in accordance with the results of our earlier tax research (especially Tóth and Semjén, 1998, strengthened by some macro evidence in Semjén, 2001), and fit nicely to the results of other empirical research (Lackó, 2000, Sik, 2000, and Tóth and Sik, 2002) on unofficial economic activities in Hungary.

The survey results show substantial improvement in corporate opinions regarding tax policy and administration. Tax laws and rules are perceived less complicated than earlier, and the public relations of the tax authority are also rated better, the role of personal contacts in settling tax debates decreased. The latter result also indicates that some *positive change* (decrease) *in latent corruption in tax administration* can also be considered likely.

We can suppose that three factors were instrumental in the decrease of the share of the black economy: (a) improving business climate and prospects and (b) an increase in the level of integration of the Hungarian economy (and the country's expected accession to EU) into the European economy, operating at a much lower level of involvement in the black economy[18] (c) structural changes increasing the role of foreign ownership in the Hungarian economy.

The positive effects of favourable business prospects on financial and fiscal discipline and involvement in the black economy may be attributed to a shift in the relative ratio of the expected net benefits from the legal and

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[18] Any increase in the degree of the country's integration into the European economy will foster the decrease of the black economy (and our survey results show clearly some obvious signs of this increasing integration, as both the share of firms producing for export and the share of these firms' export revenues to their net sales increased gradually over time). Owing to the high import intensity of Hungarian exports, on the input side there is little possibility for these firms to rely on the underground sector and make unreported purchases. (The rules of VAT refund are also instrumental in this respect.) On the output side customs regulations and their enforcement make large scale smuggling extremely difficult and thus practically exclude unreported export sales. As European competitors are likely to be less involved in hidden economy than the average Hungarian firm, in export markets there is also less competitive pressure or incentive to „go black" than in the domestic market.

the underground sector. Good business prospects, high GDP growth increase the expected income from official economic activities. At the same time there is a chance that the level of tax administration and tax audits also improve (as economic growth provides more resources for the strengthening of tax administration)[19]. Thus economic costs related to the involvement in the underground sector must increase. According to some standard models[20] such a process in itself might *ceteris paribus* accelerate the relative decrease of black economy. If economic growth can be coupled with some decrease of the average tax burden on enterprises (and the chance for this are obviously not that bad in a booming period) these two factors together may lead to a significant reduction of expected net benefits from involvement in the black economy.

All in all, our data from three different enterprise surveys unanimously support the hypothesis that the importance of unofficial economic activity of registered Hungarian medium and large enterprises radically diminished since 1996. As we also have information about the selected enterprise group's opinion on the unofficial activities of their contractual partners and main domestic competitors, our data enable us to generalise this finding to the whole registered business sector In Hungary.

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[19] Our earlier research on tax administration (see Semjén, 2001) showed growing inputs and increasing professionalism in the field of tax audits in the 1990s; it was also shown that audit probabilities also increased from 1996 on for the enterprise population relevant for our present research. At the same time tax arrears detected by these tax audits (and, consequently, public revenues from such audits) amounted to an increasingly smaller portion of GDP between 1993 and 1997, then stabilised at a much lower level then before. The indicated decrease in the "efficiency" of tax audits (at least if one can agree that increasing personnel, higher costs and some institutional changes indicate some increase in the professionalism of administration) can be attributed to some extent to the decreasing share of black economy.

[20] See Allingham-Sandmo, 1972, Alm, 1998, Bowles, 1999, Klitgaard, 1988, Sandmo, 1981 and Yitzhaki, 1974

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APPENDIX

A1. Testing the goodness of fit of our sample to the selected enterprise population

When testing the goodness of fit of our sample we used the following H_0 0-hypothesis and H_1 as an alternative hypothesis:

H_0: $P(C_i) = P_i$, i=1,2,....,k ($\sum_{i=1,...k} P_i$=1)

H_1: $P(C_i) \neq P_i$ for some i-s

where $P(C_i)$ denotes the probability of (belonging to) the category C_i in the sample (containing n elements), while

P_i is the probability of (belonging to) category Ci in the population.

The testing of H_0 was based on the joint distribution of companies by sector and number of employees. The test used was a Chi-square test, where $nP_i \geq 5$ must hold for the number of observations in each cell. To execute the test one has to determine (for the given degree of freedom and the selected confidence level) the (upper) critical $\chi^2_{1-\alpha}(v)$ value, where v is the degree of freedom *(v=k-1)*, and α is the level of significance. We will make the test at a 5 percent level of significance, i.e. at 0.95 probability.

Table A1.1

Chi square test based on the joint distribution
of enterprises by sector and size (number of employees)

Categories	Observations	Expected* distribution	Residual
Manufacturing, 1–99 employees	79	92.2	-13.2
Manufacturing, 100–249 employees	69	68.0	1.0
Manufacturing, 250– employees	57	49.4	7.6
Construction, 0–99 employees	31	23.7	7.3
Construction, 100– employees	8	10.8	-2.8
Trade and comm., 0–99 employees	28	31.4	-3.4
Trade and comm., 100–249 employees	20	17.1	2.9
Trade and comm., 250– employees	8	7.5	0.5
Total	300	300	-

Statistics	
Chi- square	6.993
Degree of freedom	7
Significance	0.430

* expected distribution is based on the actual distribution in the enterprise population.

Note: with 3 sectors and 3 size categories we should have 9 categories altogether for the joint distribution .However, owing to empty cells or cells where $nP_i \geq 5$ did not hold, this number was reduced to 8.

As the critical value $\chi^2_{1-0.05}(7) = 14.1$ is above the chi-square statistics in *Table A1.1*, we can accept H_0 at the selected level of significance. This means that the joint distributions of the sample and the population can be considered the same at 0.95 probability level.

A2. The distribution of enterprises in the sample according to some variables

Table A2.1

Enterprise distributions by type of majority owner, size and the ratio of exports to net sales in the three surveys

Variable Categories	1996	1998	2001
Type of majority owners*			
(Individual or corporate) foreign o.	19.1	20.7	27.8
Hungarian individual o.	37.5	42.4	42.8
Domestic corporate owner	20.1	20.8	19.4
Public sector (central or local government)	13.3	6.6	4.3
Mixed o.**	9.9	9.5	5.6
Total	100.0	100.0	100.0
N	293	300	299
Company size (number of employees)			
– 100	43.1	41.8	44.8
101 – 200	26.6	30.5	26.3
201 – 300	11.4	12.3	13.8
301 –	19.0	15.4	15.2
Total	100.0	100.0	100.0
N	290	295	297
Ratio of export revenues to net sales, percent			
Zero	45.7	42.6	33.7
0.01-20	27.0	18.5	19.9
20.01-50	12.3	12.9	15.2
50.01-	15.0	26.0	31.3
Total	100.0	100.0	100.0
N	293	300	297
Sales for export			
Yes	54.6	61.2	65.3
No	45.4	38.8	34.7
Total	100.0	100.0	100.0
N	293	300	291
Average share of export revenues in net sales for companies with sales for export			
Average share (percent)	33.9	45.8	48.3
N	159	178	190

*: Type of majority owner(s) is determined upon the capital share of owner(s) belonging to a given ownership category. If this share in the company's capital assets exceeds 50 percent for any given type of owner(s), then that type of owner(s) is considered the type of majority owner(s).

** If no type has a capital share exceeding 50 percent, the company is categorised as one with **mixed** ownership (no majority owner).

Table A2.2

**Changes in employment levels and the ratio
of fringe benefits to total wage cost**

Variables	Categories	1996	1998	2001
Employment (number of employees) compared to previous year				
	Decreased by 20 percent or more	13.6	–	–
	Decreased by less than 20 percent	43.7	–	–
	Did not change	17.8	–	–
	Increased by less than 20 percent	19.6	–	–
	Increased by 20 percent or more	5.2	–	–
	Decreased	57.3	37.1	35.5
	Did not change	17.8	16.6	26.7
	Increased	24.8	46.3	37.8
	Total	100.0	100.0	100.0
	N	292	300	296
Ratio of fringe benefits to total wage cost*				
	Less than 5 percent	61.5	48.2	51.6
	5 percent or more	38.5	51.8	48.4
	Total	100.0	100.0	100.0
	N	278	281	275

* Total wage cost includes gross wages and social security contributions borne by the
employer.

Table A2.3

Changes in the discipline of payments, 1996-2001, percent

		1996	1998	2001
Did it occur in the last 12 months that the company could not meet its contractual payment obligations to other businesses in time?				
	No	83.3	90.2	95.0
	Yes	16.7	9.8	5.0
	Total	100.0	100.0	100.0
	N	293	298	301
Did the company have any delay in the payment of social security contributions over the last 12 months?				
	Yes	17.7	6.8	13.6
	No	82.3	93.2	86.4
	Total	100.0	100.0	100.0
	N	293	299	301
Did it ever happen during the last two years that a tax obligation was not paid in due time?				
	Yes	38.7	27.1	23.0* (12.3)
	No	61.3	72.9	77.0* (87.7)
	Total	100.0	100.0	100.0
	N	293	296	300

* 2001 data for tax arrears are not fully comparable with the earlier ones as they also include social security contribution arrears over the last two years. Data in parentheses refer to tax arrears only but not on a two year but a 12-month time span. If the relevant data were fully comparable with the earlier ones the improvement might have been somewhat more pronounced than it appears in the table.

Table A2.4

**The incidence of unreported sales
(some aspects of participation in the black economy)
1996-2001,** percent

	1996	1998	2001
Unreported sales amongst your contractual partners…			
never occur	79.8	80.7	83.0
(are) rare	13.7	14.6	13.5
(are) frequent	6.5	4.7	3.5
Total	100.0	100.0	100.0
N	277	286	288
Unreported sales in the Hungarian economy			
never occur	-	1.2	2.2
(are) rare	10.6	18.4	32.7
(are) frequent	89.4	81.4	65.1
Total	100.0	100.0	100.0
N	274	272	269
Unreported sales amongst your domestic competitors			
never occur	43.1	45.0	58.5
(are) rare	23.6	25.2	20.3
(are) frequent	33.3	29.8	21.2
Total	100.0	100.0	100.0
N	195	218	217
To what extent has your domestic competitors' involvement in the black economy (as buyers or sellers) an influence on your company's competitive position?			
No influence at all	28.8	38.5	49.5
Influence to small extent	31.0	27.9	31.5
Influence to great extent	40.2	33.6	19.0
Total	100.0	100.0	100.0
N	271	276	279

Table A2.5

**Changes in corporate opinions regarding taxes
and the tax system, 1996-2001,** percent

	1996	1998	2001
Tax rules in Hungary			
are stable and change rarely	–	0.5	1.0
change only when necessary	3.1	4.6	13.1
change frequently	96.9	94.9	85.9
Total	100.0	100.0	100.0
N	292	298	298
Does the extent of change of tax rules jeopardise the reliability of your company's business calculations?			
No	28.8	48.5	64.4
Yes	71.2	51.5	35.6
Total	100.0	100.0	100.0
N	293	299	295
To what extent do(es) ……… jeopardise the competitiveness of your company (in export markets) (1 – to a great extent. 5 – not at all)	Average ratings		
Social security contributions	1.87	2.12	2.74
Personal Income Tax	2.96	3.12	3.08
Value Added Tax	3.17	3.39	3.67
Corporate income tax	4.38	3.59	3.36
Local taxes	4.45	3.80	3.55
Customs and duties	-	-	3.40

**Corporate opinions on the tax system and administration,
1996-2001,** percent

Statement	Corporate opinion	Year		
		1996	1998	2001
Tax legislation is so complicated that even professional accountants find it difficult to handle				
	fully agrees	75.7	78.2	67.3
	finds some truth in it	21.2	20.0	29.3
	definitely disagrees	3.1	1.8	3.3
	Total	100.0	100.0	100.0
	N	292	298	300
Many tax forms are difficult to understand				
	fully agrees	57.2	63.8	49.0
	finds some truth in it	30.8	27.7	38.7
	definitely disagrees	12.0	8.5	12.3
	Total	100.0	100.0	100.0
	N	292	295	300
Personal contacts do matter at the tax authority when settling a tax dispute				
	fully agrees	52.3	50.5	42.2
	finds some truth in it	33.0	34.9	38.6
	definitely disagrees	14.7	14.6	19.1
	Total	100.0	100.0	100.0
	N	279	278	277
Tax authority informs businesses properly and in due time about their obligations				
	fully agrees	11.3	13.3	19.0
	finds some truth in it	33.0	39.2	42.5
	definitely disagrees	55.7	47.5	38.4
	Total	100.0	100.0	100.0
	N	291	296	294

A3. Estimating the share of tax evading firms

Needless to say once more that tax evasion cannot be observed and estimated directly: One cannot ask a direct question in a survey concerning such a delicate issue and expect the respondent to give a sincere answer. Obviously, some indirect and more sophisticated method must be chosen. The randomised response technique was used here. This technique allows the researcher to estimate the true frequency of replies to especially delicate survey questions (such as questions on unconventional sexual behaviour, AIDS infection, drug abuse, or for that matter. tax fraud) in a sample and use the methods of statistical inference to arrive at valid statements for the population the sample was selected from. This way delicate issues may be successfully analysed using survey data.

The method is based on the following: the respondent is given a pack of cards. Each card contains one of two opposite statements (one admitting and one denying the unobservable behaviour or characteristic: in our case one statement admitted and the other denied that the enterprise ever committed tax evasion or tax fraud over the last two years). The respondent is then asked to shuffle and draw a card randomly and tell the interviewer. *without letting him know what the statement on the card actually was.* whether the statement is *true or false* in his case. The proportion of admission (p) and denial cards (1-p) must be determined beforehand in such way that p must not be equal to 0.5; in our surveys p= 0.7 was used. The technique allows the researcher to determine the incidence of the studied hidden phenomenon in the population using an estimator based on the relative frequencies of "true" and "false" answers and the given share of cards containing the admission statement[21].

The estimator of tax evasion rate (TER) can accordingly be determined by the following formula:

$$TER = \frac{1}{2p-1}(X/n + p - 1) \qquad (1)$$

where TER is the estimated rate of tax evading businesses,
p is the share of cards admitting tax fraud,

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[21] For a more detailed description of the method and the mathematics of the estimator, see *Särndal* et al., 1992.

n is sample size (number of enterprises in the sample),
and X is the number of "true" answers to this question.

The variance of this estimator can be calculated according to the following formula:

$$V(tax\ evasion\ rate) = \frac{1}{(2p-1)^2}(\frac{1-f}{n-1}\frac{X}{n}(1-\frac{X}{n})) + p(1-p)/N \tag{2}$$

where V(TER) is the estimated variance of the share of tax evading businesses,

N is the size of (enterprise) population from which the sample was drawn,

and f is n/N.

Knowing the estimator and its variance will allow us to determine the mean and a confidence interval for the population at a given significance level: based on this we can arrive at conclusions on the frequency of tax evasion in the selected enterprise population.

In our surveys each card contained one of the following two statements:

A1: "During the last two years of the company's operation the company committed tax evasion (evaded some taxes)."

(p = 0.7)

A2: "During the last two years of the company's operation the company never committed tax evasion (did not evade taxes)."

(p = 0.3)

Answers could be "True" or "False".

In our 1998 survey the estimated rate of tax evasion was 8.8 per cent, and the estimated variance allowed us to estimate a ± 14 per cent 95 percent confidence interval. As the rate of tax evasion cannot be negative, these results suggested that the true rate of tax evasion in the enterprise population surveyed fell in the (0; 22.8) percent interval with a 8.8 per cent mean with 95 percent probability. (Cf. Tóth and Semjén, 1998.) These results suggest that probably there existed some tax evasion in 1998, however, at 95 percent probability level the data would not allow us to exclude even the – rather unlikely – case of complete tax compliance in the studied population.

For 2001 the above estimation led to somewhat strange results: we got a slightly negative mean share of tax evading firms, as out of the 289 an-

swers only 78 (27 percent) were "True" while 211 (73 percent) were "False".

As the number of cards acknowledging tax evasion was 7 out of 10, and cards denying it numbered to 3 respectively, the true share of "true" answers must have been at least 30 percent[22] if the cards were drawn perfectly randomly, all answers were honest and the sample size was big enough for the laws of probability to hold. Given the observed values of "True" and "False" answers, the resulting mean share of tax evading firms from formula (1) became negative. However, with such small sample size an estimated negative mean, just slightly outside the theoretically meaningful [0; 1] range, does not necessarily indicate any problem, and the resulting interval estimation (after omitting the negative values) still could be meaningful[23].

Although we saw that an observed share of "True" answers below the theoretically true minimum (in our case 30 percent) does not necessarily indicate a "technical" problem (e. g. not perfectly random draw) or dishonest answers (due to improper interview situation[24]), still we wanted to dou-

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[22] Provided that there was absolutely no evasion in the sample and everybody answered honestly, the true theoretical share of "True" answers must be 30 percent. In such a case those drawing card A1 must answer "False" (as they did not evade taxes), while those drawing A2 must answer "Yes" (as the card they drew implied the truth, i.e. that they did not evade taxes either). If the sample is big enough and the card draws are perfectly random, the actual estimated value must be reasonably close to this theoretical value according to the laws of probability theory and the law of great numbers. In the other extreme situation, where all companies evade taxes, the true share of "True" answers equals 70 percent (as everyone receiving card A1 should answer "Yes", while the true share of "False" answers must be 30 percent). As in any case "True" and "False" answers are the only possible options, the theoretically true range for the share of any of the two possible answers must be the [0.3; 0.7] interval. However, if the sample size is relatively small, the actual realisation of card draws (the share of cards acknowledging or denying tax evasion) does not necessarily approximate very closely the theoretical probabilities, as the preconditions required for the validity of the law of great numbers do not hold (n does not tend to infinity). Thus observed frequencies can easily fall outside the theoretically correct interval.

[23] As 300 is fairly small as compared to infinity, we cannot expect the observed frequencies to be very close to the theoretically true probability values, so such minor discrepancies might be explained and tolerated.

[24] Dishonest answers can occur if some of the interviewers failed to create a proper interview situation by making the respondent understand that he (the interviewer) will not have any direct information regarding the respondent's tax compliance or evasion from the answer to this special card-question. This might have been the case if the

blecheck if all interviews were conducted properly and cards were drawn randomly[25]. Checking the data by interviewers we found that there were some suspect interviewers with a strangely patterned distribution of "True" and "False" answers in their respective sub-samples[26]. WE could suspect that in these cases this second type of error (due to the lack of shuffling) might have been occurred, provided that the vast majority was compliant and tax evaders were distributed randomly amongst interviewers. So, when estimating the share of tax evading firms, we finally decided to leave out all answers (altogether 44 cases) from companies interviewed by these suspect interviewers.

Thus the observed share of "True" and "False" answers already fell between the theoretically acceptable boundaries. The 31 percent share of "True" and the 68 percent share of "False" answers imply that the mean share of tax evading firms can be estimated according the method described above at 2.5 percent with 95 percent level of confidence. This and the variance of the estimator computed according to (2) allow us to make an interval estimation: the share of tax evading firms must fall into the 2.5±14.1 percent interval at a 95 percent level of confidence. On the other hand the share of tax evading firms cannot be negative under any circumstances, thus the share of tax evading firms should fall into the (0, 16.6) interval with 95 percent probability. This means that the maximum percentage share (incidence) of tax evading firms in 2001 can be estimated (at a 95 percent level confidence) at 16,6 percent[27], while in 1998 this maximum value was much higher, 22.8 percent. The 2.5 percent mean for 2001 is also much smaller then the 8.8 estimated in 1998. Thus our results indicate that the share of tax evading firms probably decreased somewhat during the 1998–2001 years.

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interviewer did not show the cards with the two different statements to the respondents before shuffling and drawing, and thus the respondent could not be sure whether the cards indeed differed from each other as had been stated.

[25] Besides the relatively small sample size another possible explanation for observed values outside the true theoretical range can be that some of the interviewers did not shuffle the cards before asking the respondent to draw one. If this was the case, respondents did not draw randomly, and this might have seriously distorted the frequencies of "True" and "False" answers.

[26] We found 5 interviewers who nearly always got "False" answers only. (Out of 44 cases they got only 2 "True" answers altogether as compared to 42 "False" answers.)

[27] If our suspicions regarding the "suspect" interviewers proved groundless or unfounded, the maximum possible share of tax evading firms would be even smaller that this estimation.