DEPARTMENT OF ECONOMICS
JOHANNES KEPLER UNIVERSITY OF LINZ

The Shadow Economy in Colombia:

Size and Effects on Economic Growth

by

SCHNEIDER, Friedrich[*)] and HAMETNER, Bettina

Working Paper No. 0703
January 2007

Johannes Kepler University of Linz
Department of Economics
Altenberger Strasse 69
A-4040 Linz - Auhof, Austria
www.econ.jku.at

friedrich.schneider@jku.at
phone +43 (0)70 2468 -8210, -8209 (fax)

THE SHADOW ECONOMY IN COLOMBIA:
SIZE AND EFFECTS ON ECONOMIC GROWTH

by
Friedrich Schneider[*]
and
Bettina Hametner[**]

Abstract:

Using the currency demand approach size and development of the Colombian shadow economy are estimated over the period from 1976 to 2002. In the 70s the size fluctuated around 20% of official GDP and rose to 50% in the 90s. The most important factors driving the shadow economy are unemployment and taxation. Analyzing the interaction between shadow and official economy, the shadow economy has a positive effect on the official one. Average growth rate of real per capita GDP is 1.11% between 1976 and 2002 and the shadow economy "explains" on average between 0.09 and 0.27 of this growth.

JEL-Code: 017, 05, D78, H2, H11, H26

Key-words: Colombian shadow economy, currency demand method, taxation, unemployment, interaction between the shadow and official economy.

---

[*] Prof. Dr. Dr.h.c.mult. Friedrich Schneider, Department of Economics, Johannes Kepler University Linz, Altenbergerstraße 69, A-4040 Linz-Auhof, AUSTRIA, Phone: 0043-732-2468-8210, Fax: -8209, E-mail: friedrich.schneider@jku.at, http://www.econ.jku.at/Schneider
[**] Bettina Hametner, student at the Department of Economics, Johannes Kepler University Linz, Phone: 0043-664-4844206, E-mail: bettina.hametner@gmx.at

1. **Introduction**

Colombia is a developing country which unfortunately made the headlines in the media because of her drug crime business which negatively influenced Colombia's image by her large-scale cocain production and trade especially since the 80s. Our paper, however, does not deal with drug trafficking or other illegal (i.e. classical crime) economic activities in Colombia, because the focus of our study is the estimation of the size and the development of the shadow economy over time and its influence on the "official" economic growth of Colombia. To our knowledge these two aspects have not been investigated so far, especially the interaction of the shadow economy with the official one and here the question whether the shadow economy has a positive or negative effect!

Our paper is divided in five parts. After this short introduction, in part 2 some theoretical considerations about this topic are given, explaining different ways of defining a shadow economy, analyzing the main causes that support underground activity and discussing interactions between formal (official) and informal (shadow) economy. In part 3, the econometric results of regression models based on the currency-demand approach (to calculate the size of the shadow economy in Colombia) are presented. Based on these results, in part 4 econometric estimations are shown which demonstrate the influence of the shadow economy on the official one, here on "official" economic growth. In part 5, the study concludes with a summary of the main findings and a brief outlook on possible policies to tackle the problem of underground activities.

2. **Theoretical background**

2.1. *Defining the shadow economy*

Researchers attempting to estimate the size of shadow economy face the problem of defining a shadow economy. One commonly used (working) definition is: All currently unregistered economic activities are counted that contribute to the officially calculated (or observed) Gross National Product.[1] Smith (1994, p. 18) uses the definition "market-based production of goods and services, whether legal or illegal, that escapes detection in the official estimates of GDP." One of the broadest definitions includes "those economic activities and the income derived from them that circumvent or other wise

---

[1] This definition is used, for example, by Feige (1989, 1994), Schneider (1994a, 2003b, 2005), and Frey and Pommerehne (1984). Do-it-yourself activities are not included.

government regulation, taxation or observation".[2] As these just mentioned definitions still leave open a lot of questions, Table 2.1 summarizes what could be a reasonable consensus about the definition of the underground (or shadow) economy. From Table 2.1, it is clear that a broad definition of the shadow economy includes unreported income from the production of legal goods and services, either from monetary or barter transactions – and so includes all economic activities that would generally be taxable were they reported to the tax authorities.

Table 2.1:A taxonomy of types of underground economic activities

monetary transactions		non-monetary transactions	
illegal activities			
- trade with stolen goods - drug dealing and manufacturing - prostitution - gambling - smuggling - fraud - etc.		- barter of drugs, stolen goods, smuggling, etc. - producing or growing drugs for own use - theft for own use	
legal activities			
tax evasion	*tax avoidance*	*tax evasion*	*tax avoidance*
- unreported income from self-employment - wages, salaries and assets from unreported work related to legal services and goods	employee discounts, fringe benefits	barter of legal services and goods	all do-it-yourself work and neighbour help

Source: Structure of the table is taken from Lippert and Walker (1997, p. 5) with additional own remarks.

Our paper uses a more narrow definition of the shadow economy[3]: The shadow economy includes all market-based legal production of goods and services that are deliberately concealed from public authorities for the following reasons:

(1) tax evasion or tax avoidance,

(2) to avoid payment of social security contributions,

(3) to avoid having to meet certain legal labor market standards, such as minimum wages, maximum working hours, safety standards, etc., and/or

---

[2] This definition is taken from Del'Anno (2003), Del'Anno and Schneider (2004) and Feige (1989). See also Thomas (1999) and Fleming et al. (2000).

[3] Compare also the excellent discussion of the definition of the shadow economy in Pedersen (2003, pp. 13-19), who uses a similar definition.

(4) to avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms.

Hence, this paper does not deal with typical economic activities that are illegal and fit the characteristics of classical crimes like burglary, robbery, drug dealing, etc. The definition used also excludes all non-market based economic activities like neighbour help, household and do-it-yourself work.

2.2. *Theoretical considerations about the main causes for the existence of the shadow economy*
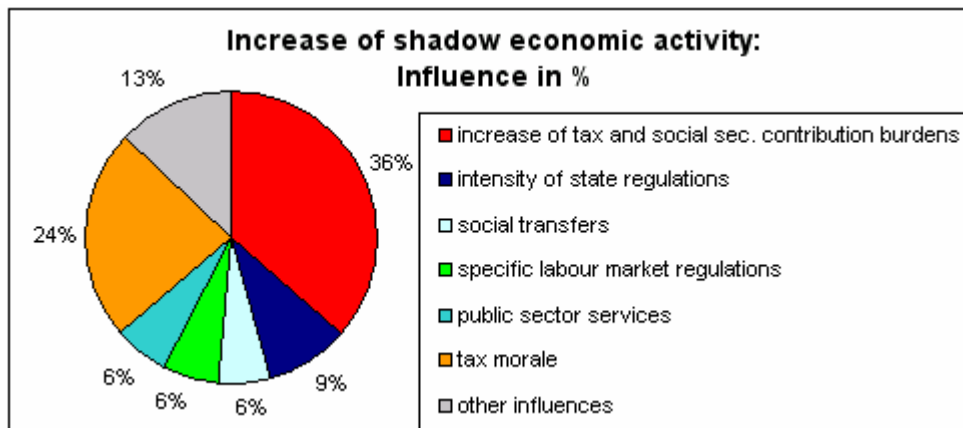
(1) Tax and social security burdens

Numerous studies demonstrate, that an increasing burden of taxes and social security contributions is one of the main causes for the development and increase of shadow economic activities.[4] The reason is that this form of fiscal intervention has a strong influence on individuals' cost-benefit and/or labour-leisure choices because it heavily increases the opportunity cost for legal economic activities and finally reduces the profitability of legal (official) work. The greater the difference between total cost of labour in the official economy and after-tax earnings from work, the greater is the incentive to work in the shadow economy. However, even major tax reforms with major tax rate deductions may not lead to a substancial decrease of the shadow economy.[5] Such reforms may stabilize the size of the shadow economy and avoid a further increase. Social networks and personal relationships, high profits form irregular activities, and associated investments in real and human capital prevent people from going back to the official economy.[6]

Figure. 2.1: *Main causes for the increase of shadow economic activities.*

---

[4] See Enste in Bajada/ Schneider (2005), Schneider (2005, 2006), Alm (1996)
[5] See Schneider (1994b, 1998b) for a similar result of the effects of a major tax reform in Austria on the shadow economy.
[6] For Canada, Spiro (1993) found such reactions of people facing an increase in indirect taxes (VAT, GST).

Increase of shadow economic activity: Influence in %

- increase of tax and social sec. contribution burdens — 36%
- intensity of state regulations — 9%
- social transfers — 6%
- specific labour market regulations — 6%
- public sector services — 6%
- tax morale — 24%
- other influences — 13%

Source: Schneider (2006).

Figure 2.1 illustrates the great importance of tax and social security contribution burdens on the size and the development of the shadow economy. Further empirical studies of the influence of the tax burden on the shadow economy by Schneider (1994b, 2000) and Johnson et al. (1998a,b) also show statistically significant evidence for the influence of taxation on the shadow economy. A strong influence of indirect and direct taxation on the shadow economy is additionally demonstrated by empirical results for Austria and Scandinavian countries from Schneider (2005).

(2) Intensity of regulation

The original objectives of regulations were to avoid market failures, hence the goal was to increase welfare, reducing external effects and redistribution of wealth for higher justice within the population. Labour market regulation mostly for employees' and workers' protection mainly show, at least in the long term, positive effects. However, regulations also lead to the fact that people often consider such interventions of the government as a limitation of their personal freedom. In addition, fullfilling laws normally causes supplementary cost and may therefore have a negative influence on production possibilities and competitivity of individuals and firms. A higher scope of regulation leads in most cases to higher bureaucratic expenditures for individuals and firms as well as for public authorities (Schneider (2000)) and may be a "hotbed" for corruption, particularly in developing countries. To sum up, individuals often consider increasing intensity of state regulation as cost-rising and freedom-limiting. Therefore, increasing intensity of regulation supports the switch to shadow economic activities. These theoretical considerations are supported by empirical studies, which show, that increasing intensity of regulation leads to a growing shadow economy.[7] At this point it is should be mentioned, that a higher possibility of detection and/or higher expected

---

[7] Compare Schneider (2005), Wagner (1984), Enste (2005) and especially the survey of Schneider and Enste (2002).

punishment also influence the growth of the shadow economy negatively (Wagner (1984)).

(3) Changes in labour market conditions and the employment system

A rationing (i.e. strong policy intervention) on the official labour market, e.g. reduction of maximum working hours per week, or a decrease of the age for retirement have the effect that people have available much more time which can be used for shadow economic activities. Another argument could be that after such changes people find themselves confronted with circumstances where their desired total working time no longer corresponds to their actual one, so that they have a strong incentive to engage in shadow economic activities. An economic crisis may also lead to a reduction of the work force needed in the official labour market; hence it is common that during recessions the official demand for labour decreases and unemployment rises. Thus, it is not surprising that during the worldwide recession in the 70s a general increase in the extent of shadow economic activity was observed (Gijsel (1984)).

An increase in transfers (e.g. unemployment benefits, pensions, etc.) reduces the incentives to work in the official economy, too. As a consequence, people choose to work less in the official economy and as a result may increase their shadow economic activities.

Another incentive for working in the shadow economy is a rise in the wage rate in the informal sector (e.g. caused by higher demand for illicit work) as this increases the rentability of illicit work relative to employment in the official sector. In a similar way, a reduction in the net wage rate in the official economy (e.g. due to an increase in payroll tax) decreases the rentability of work in the official economy or the marginal utility of the extension of official working time which may also lead to an increase of shadow economic activity. However, this argumentation is only valid for considerations on a microeconomic basis. According to macroeconomic theory, lower wages lead to higher employment as demand for labour increases and lower unemployment implicates, ceteris paribus, lower activity in the shadow economy.[8]

(4) Changes in individual values and general attitude towards shadow economic activity

In all „civilized" societies politicians interfere in the economy in order to "fix" the limits between legality and illegality and to regulate the functioning of economic life. These interventions, however, may not be according to everybodies' idea of morality and

---

[8] Schneider/ Enste (2002), Wagner (1984), Enste (2005) and Kirchgässner (2006).

understanding of justice (Besozzi (2001)). This means that people have no bad feelings towards „normal" shadow economic activities; people often may find it easy to justify their unofficial supply or demand for goods and services because friends and family members just "do the same" (Schneider (2000, p.8)).

The term „changes in individual values" generally consists of all possible changes in morality of a certain group or a whole country's population relating to their willingness to accept state regulations. They may also change their view of the competence of public authorities, tax morale and the common attitude towards shadow economic activities. In general, if trust of the public authorities is high handling their affairs and if the population shows a positive attitude towards fiscal interventions, one normally expects lower shadow economic activities (Haslinger (1984) and Kirchgässner (2006)). For instance a change in individual values may happen, when taxpayers suddenly believe that they no longer receive adequate social services or benefits for the revenues paid to the government. Another example is the increase in overall tax burdens which is not accompanied by immediate and visible increases in (social) state services. Such events lower the acceptance and the trust in public authorities and increase the incentive to engage in the shadow economy, partly because in such situations people may feel the need to balance subjectively felt individual welfare losses out themselves.[9]

2.3. *Theoretical reasoning about the interaction between official and inofficial economies*

Obviously there are many interactions between the official and inofficial (shadow) economies in a country, hence a strict separation of these two parts of the economy is not possible.[10] Therefore it is not surprising that there is a continuous interaction between official and unofficial economy. Naylor (1996) emphasizes that the official part of the economy could never work efficiently if it were totally separated from the unofficial part. A study carried out by the OECD confirms further, that the shadow economy permanently competes with the official economy, on the other hand Lubell (1991) states that the formal and informal economies also complement each other. Other studies (Lubell (1991), Besozzi (2001) and Schneider (2005)) show, that a certain influence of the shadow economy on the efficient functioning and development of the official economy can not be denied.

---

[9] Schneider (2000) and Gretschmann (1984).
[10] Compare Besozzi (2001), Naylor (1996) cited in Besozzi (2001, p.12), Lubell (1991) and Schneider (2005).

One of the shadow economy's main influences is the one on the tax sytem. As a consequence, redistribution policies based on tax revenues and the overall financing of the public sector are affected. For instance, one hypothesis is that a reduction in the size of the shadow economy leads to higher tax revenues, if and only if this leads to an increase in economic activities in the official sector, which happens only to a very limited extent. These additional resources can then be invested in a qualitative and quantitative improvement of public goods and services which in turn induces economic growth (Schneider (2005)). On the other hand, Schneider (2005) argues that shadow economic activity even generates additional tax revenues if these shadow activities are complementary to the official economy and if the earned extra income is spent in the official economy for goods and services.

Frey (1989) mentions that especially in developing countries parts of the raw materials and semi-produced goods used in the official economy originate from shadow economic sources. Particularly in developing countries, the actors of the informal economy established themselves as important customers, suppliers and business partners of firms working in the official economy (Besozzi (2001)). This again underlines the strong interdependence between formal and informal economy (Witte (1996) and Lubell (1991)).

Applying the allocation theory, the shadow economy has positive effects on the overall functioning of an economy: more efficient use of scarce resources, stimulation of markets and competition, incentives for firms and individuals, enlargement of market supply with additional goods and services, generation of additional income, more creativity and more innovation, etc. However, the allocation effects of the shadow economy are not exclusively positive. Unfair ruineous competition due to cost advantages of suppliers in the informal economy may cause official suppliers to be pushed out of the market as they are no longer competitive. In addition, a lack of transparency and a lacking structure of the inoffical sector may lead to problems in information flows and consequently will lead to a higher intransparency of the markets which means that conditions for both, suppliers and consumers, become harder for efficient comparisons of quality and prices. On the other hand, unofficial suppliers often work under perfect competition, so that the condition of setting prices equal to marginal cost holds. Higher competition creates incentives, which lead to more efficient resource allocation on both sides, the official and the shadow economy (Schneider (2003a)).

Another problem caused by the shadow economy is the bias in the officially published data of economic figures which are used for economic policy decisions, too. As the informal part of the economy does not appear in official statistics, it can only be taken into consideration with rough approximations or in the extreme case, not at all. Hence, all stabilizing, redistributional and fiscal policies are based on inaccurate or even false indicators. A study by Feige and McGee (1989) shows, for instance, that traditional anticyclical monetary and fiscal policy measures do not have the desired stabilizing but destabilizing effects if shadow economic activity is not taken into consideration. McGee (1989) describes a very impressive model in which monetary policy, aiming at full employment and only based on indicators of the official economy, disregarding the shadow economy, does not lead to the required positive labour market effects but causes stagflation.

Whether economic efficiency or justice should be the primary interest for politics is a controversial issue, however, governments usually implement redistribution policies to some extent, where efficiency is strongly influenced by the shadow economy. As the size of the informal sector can only be estimated and also the individuals acting in the underground can not be identified precisely, it is possible that those benefiting from public services and allowances intended to support the underprivileged part of the population identified by official statistics, are not the real "needy". The easier it is for individuals to cheat and the more are doing it, the higher are the official expenditures in these categories leading to an even higher light budget situation. This either leads to an increase in overall taxation, or to a reduction in social services and allowances. Regardless of how a government finances this discrepancy, there will always be many citizens feeling cheated (those who are forced to pay more and more taxes, those who receive too little social benefits despite their neediness, etc.). This may easily end in a vicious circle, as individuals, who feel unfairly treated rapidly begin establishing "justice" themselves, doing their own redistribution policies by migrating into the shadow economy which causes the official redistribution policies to fail their objectives even more (Schneider and Enste (2002)). In this respect, Fleming, Roman and Farrell (2000) claim that the size of the shadow economy may even serve as an indicator of how efficient or inefficient political strategies are, as inappropriate policies are incentives for individuals to begin acting in the underground.

Various studies (e.g. Schneider (2005 and 2006)) demonstrate the interaction between the official and the shadow economy, still, but their results are discussed controversially, especially, whether positive effects predominant negative ones or vice

versa. As these effects among others always depend on the concrete size of the shadow economy, the intensity of interaction between formal and informal sector and the specific economic situation of a country, an answer can only be given after an empirical analysis is undertaken for concrete countries, which we will do for the case of a developing country, namely Colombia.

3. *Empirical estimates of the size of the shadow economy in Colombia*

3.1. *Estimation method and variables*

One possibility to estimate the size and development of the shadow economy is to use the currency demand approach[11]. We have chosen this approach for Colombia and have applied two variations of the currency demand model, which also have been estimated: The first uses as dependent variable, the ratio of cash holdings to checkable deposits (*CD*), the second uses as dependent variable, currency demand per capita (*CDC*). Using these two different specifications of the dependent variable, robustness and reliability of the estimation results can be examined. The independent variables used to explain the official currency demand are:

(1) the real Gross Domestic Product (GDP) per capita (*GDPPC*),
(2) the yearly average interest rate on deposits of 90 days (*IRD*),
(3) the cumulative real value of imported cash dispensers (depreciations of 20 % per year deducted) as a proxy variable for cash substitutes describing changes in cash demand over time (*ICD*).

The variables included in the model for explaining the currency demand induced by shadow economic activities are

(4) the average real direct (*TY*) and indirect (*TC*) net tax rates (tax on income and VAT),
(5) the unemployment rate (*UNEMP*), and
(6) the real expenditures for public employees in % of GDP (as a proxy for the intensity of regulation and control) (*EPE*).[12]

Estimation equation for model 1 based on the ratio of cash holdings to checkable deposits:

$$CD_t = \beta_0 + \beta_1 \times \ln GDPPC_t + \beta_2 \times IRD_t + \beta_3 \times \ln ICD_t + \beta_4 \times \ln TY_t + \beta_5 \times TC_t + \beta_6 \times UNEMP_t + \beta_7 \times EPE_t + u_t \tag{1}$$

Estimation equation for model 2 based on currency demand per capita:

$$\ln CDC_t = \beta_0 + \beta_1 \times \ln GDPPC_t + \beta_2 \times IRD_t + \beta_3 \times \ln ICD_t + \beta_4 \times \ln TY_t + \beta_5 \times TC_t + \beta_6 \times UNEMP_t + \beta_7 \times EPE_t + u_t \tag{2}$$

---

[11] For a detailed description and criticism on the currency-demand method see appendix A.
[12] For a detailed description of the variables used see appendix B., Table 1.1.

Based on monetary theory, the real GDP per capita is expected to have a positive effect on the dependent variable in both equations, whereas the interest rate should have a negative impact. Also the proxy variable for cash substitutes should influence the dependent variables positively, as it facilitates withdrawals. From the above theoretical considerations on the factors influencing the size and development of shadow economic activity, the coefficients of direct and indirect taxation, the unemployment rate and the proxy variable for the intensity of regulation are expected to have positive signs. To summarize, for both equations we derive for the independent variables the following signs:

$$\beta_1 > 0, \beta_2 < 0, \beta_3 > 0, \beta_4, \beta_5, \beta_6 \, and \, \beta_7 > 0$$

3.2. *Estimation results*

Table 3.1 shows the regression results for the two estimations based on the currency demand method. The detailed results including all statistics are shown in Appendix B, Tables 2.1 and 2.2. According to the theoretical considerations, one of the most important causes for shadow economic activity is the (total) tax burden, but the two tax variables included in the currency demand equations are not statistically significant at a 5 % level[13] - with the exception of the indirect tax burden (*TC*) in model 1. One reason for this may be multicolinearity between the two tax variables and in order to avoid this, we also tried an overall tax burden (direct and indirect tax burden), which showed up statistically significant in both equations. In our regressions we use yearly data for the period from 1976 to 2002. For model 2, we use the natural logarithm of currency demand per capita; in both variants of model 2, an ARIMA model has been specified to correct for first order autocorrelation. For model 1, a standard OLS regression has been run for the original model (var. 1a with both tax variables included) as well as for the variation (var. 1b with only one total tax variable) as test statistics here do not indicate time series problems.

---

[13] In this paper we follow the usual procedure to declare coefficients as "statistically significant", if their statistical significance is given on a 5 % or better significance level.

Table. 3.1: Regression results using the currency demand method.

regression results				
		model 1		model 2
endogenous variables		**ratio cash holdings to checkable deposits**		**currency demand per capita (ln)**
		estim. coefficients		estim. coefficients
exogenous variables		**Var. 1a**	**Var. 1b**	**Var. 2a**	**Var. 2b**
GDPPC:	real GDP per capita (ln)	0.2590352	0.3618224*	5.298498*	5.33385*
IRD:	interest rate on bank deposits (yearly average)	-0.1580274	-0.1909795	-0.544635	- 0.5517756
ICD:	cumulative value of cash dispensers (ln)	-0.0021550	-0.0106367	0.008891	0.008133
TY:	average net tax rate on income	0.5357451		2.356146	
TC:	average net tax rate on consumption	2.3821260*		3.080567	
T	overall taxation on income and consumption (ty+tc)		1.195981*		2.608898 (*)
UNEMP:	unemployment rate	2.7227350*	2.432499*	5.130958*	5.172192*
EPE:	real expenditures for public employees (% of real GDP)	-0.0370014	0.4260926	-2.597696	-2.713188
constant term		3.8371500	-5.246178*	-67.401480*	-67.8917*
* significant on 5 % level (*) significant on the 10% level					

Source: Own calculations. For more detailed tables of the regression results see appendix B.2.

The coefficients of the independent variables of both regression models show the theoretically expected signs. Only the sign of the proxy variable for cash substitutes (*ICD*) is ambiguous, but considering that it is not statistically significant in none of the four estimations, this is not too worrying.[14] It may be that this variable is not a good proxy for explaining changes in currency demand via cash substitutes. Another explanation could be that the increasing availability of cash dispensers generally has an ambivalent influence on currency demand: A higher number of cash dispensers may contribute to the attractiveness of using plastic money (higher circulation of credit and debit cards), while they simultaneously increase currency demand making withdrawals considerably more convenient. Hence, it is highly likely that the effects cancel out each other.

Regarding the other independent variables explaining the currency demand, real GDP per capita (*GDPPC*) has a statistically significant and quantitatively large influence on the dependent variable in all models. If real GDP per capita rises by 1 %, the ratio of cash holdings to checkable deposits increases by 0.003 and 0.004 in estimation 1a and 1b respectively and the currency demand per capita increases by 5.3 %, ceteris

---

[14] Also the low beta-coefficients of the variable underline that it is relatively unimportant (see appendix B.2).

paribus. Standardized beta-coefficients also show the important impact of GDP per capita on the endogenous variables, particularly in model 2a, where the beta-coefficient for real GDP per capita is 0.38 which is by far the greatest value compared to the beta-coefficients of the other variables. The coefficient on the average interest rate on bank deposits (*IRD*) has a negative sign in all regressions presented, which indicates the expected decrease in cash holdings with rising interest rates. However, the coefficient is not statistically significant (p-values between 0.24 and 0.38) in all four equations.

The variables explaining currency demand induced by shadow economic activities (direct and indirect tax rates: *TY, TC* and unemployment rate: *UNEMP*) also show the expected signs: The positive relation between rising unemployment, as well as increasing direct and indirect tax rates and the dependent variables are in line with our hypothesis that these factors support the growth of underground activities and hence have a positive impact on currency demand. Personnel cost for public sector employees (*EPE*) as a proxy variable for the intensity of regulation and control shows a negative effect on currency demand in three of the four regressions presented. According to our theoretical argumentation this is the wrong sign for this variable, as higher intervention in the market should increase the size of the shadow economy and consequently the demand for cash. One explanation for the negative relation detected could be that higher personnel cost were due to a widening of the staff in the executive areas which means higher possibility of detection of informal activities and therefore a decrease in the attractiveness of illicit work and other underground activities. However, as this variable is not statistically significant in both models and their variants, a detailed interpretation of this variable is not necessary.

With respect to the statistical significance of the independent variable unemployment rate (*UNEMP*), this variable is highly statistically significant in all models and also has a great quantitative effect on the endogenous variables. This can be shown by a comparison of the regression coefficients as well as by the standardized beta-coefficients. In our regression results, a rise in the unemployment rate by one percentage point increases the ratio of cash holdings to checkable deposits by 0.027 and 0.024 for variant 1a and 1b respectively and money per capita in circulation by 0.05 %, ceteris paribus.

The tax variables, which are considered as one of the main causes for shadow economic activities, have an important effect on the demand for money: An increase by one percentage point of the indirect average net tax rate (*TC*), whose statistical

significance is satisfactory in both of the main equations, increases the ratio of cash holdings to checkable deposits by 0.02 and the currency demand per capita by 0.038 %, ceteris paribus. The direct average net tax rate (TY), too, has a great influence on demand for cash: If the average net tax rate on income rises by one percentage point, currency demand per capita increases by 0.023 % and the ratio of cash holdings to checkable deposits increases by 0.005. However, the impact of the tax rate on income is smaller than that of the tax rate on consumption and is not statistically significant. The reason for that may be that the tax variables are highly correlated (correlation coefficient ($Cor[TY,TC]$ = 0.8145) and thus there might be a problem of multicolinearity. Nevertheless, standard F-tests show a high joint statistical significance of the tax variables. To avoid the problem of multicolinearity, a total tax burden variable is used and variations 1b and 2b of the main equation models have been estimated. The results show a large quantitative impact of overall taxation as well as statistical significance on a high level (p-values are 0.002 and 0.057 for variant 1b and 2b respectively).

Further statistical tests show a high joint significance of the variables ($TY, TC, UNEMP, EPE$) used for describing demand for money induced by shadow economic activities in both models: The four variables are jointly statistically significant on a 15 % level and the three variables TY, TC and $UNEMP$ even on a 1 % level in both of the main equation models[15].

In the next step we undertake simulations, where the values of the variables used to explain the currency demand induced by shadow economic activities ($TY, TC, UNEMP, EPE$) were held on their lowest levels, in order to calculate the theoretical („official") currency demand per capita. The difference between the real observed and the calculated theoretical demand for money gives the estimated currency demand per capita induced by shadow economic activities. These results multiplied by the velocity of money in the official economy provide value added figures of the estimated size of the shadow economy which can be shown as a percentage of GDP.

The simulation results of the different models for the size of the shadow economy in Colombia lie relatively closely together, especially the simulations derived from the two regressions with only one cumulative tax variable (variants 1b and 2b). The results are presented in Figure 3.1 which also shows the robustness of the models presented in this paper. Even if the simulation results generally show higher divergences in earlier

---

[15] See appendix B.2 for details.

years, the estimates present the same trend: The size of the shadow economy in Colombia increases rapidly until the mid 80s, followed by a slight decrease until the mid 90s. From the mid 90s on, the size of the Colombian shadow economy experiences another drastic increase. Only at the end of the period under consideration this trend comes to an end and a new slight decrease can be noticed.

Figure 3.1: Four simulations of the estimated size of the shadow economy in % of nominal GDP for Colombia, 1977-2002.
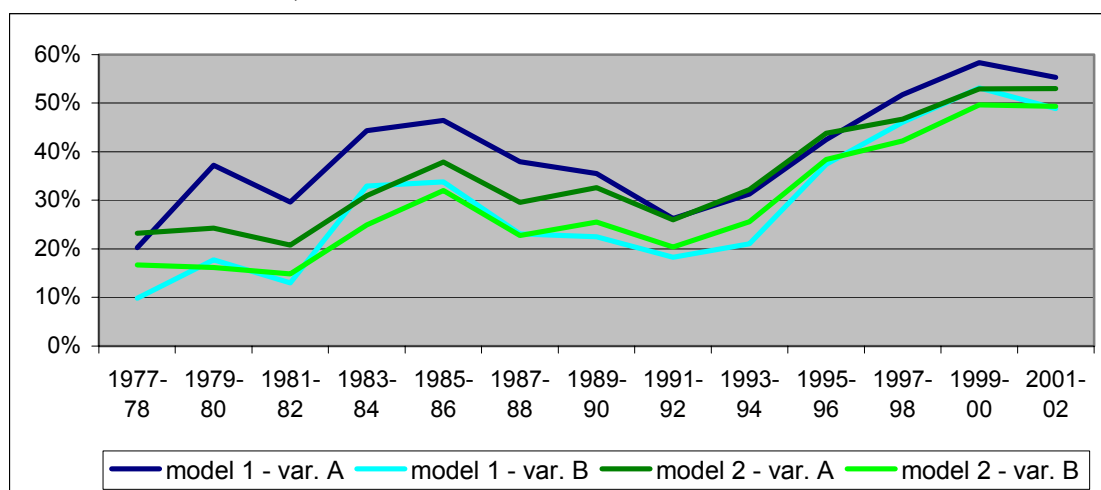
Source: Model 1 – var. A and model 1 – var. B are based on the regression results of model 1, variants a and b respectively, using the ratio of cash holdings to checkable deposits as endogenous variables whereas model 2 – var. A and model 2 – var. B use the results of the second regression's variants using currency demand per capita as endogenous variable.

The trends in the development of the shadow economy in Colombia resulting from the above simulations correspond to the general expectations: The increase until 1985 can be explained by the generally poor "official" economic situation in the country during that period (decreasing growth rates of GDP, rapid increase of the unemployment rate). During that time, underground activity was the only possibility for many people to generate income, especially for those from the poorer part of the population. The following decrease in the size of the shadow economy reflects the beginning stabilization of the economic situation. The drastic increase in the shadow economy over the last decade (1992-2000) is plausible due to another slowdown in "official" economic growth beginning in the mid 90s; it resulted in the worst recession the country experienced in the last century in 1999.

4. **The interaction of the shadow economy with the official one in Colombia**

4.1. *The estimations of a growth model*

To estimate the influence of the shadow economy on the "official" one, a growth model has to be specified, explaining the growth of real "official" GDP per capita (*GGDPPC*) by the independent factors influencing economic growth given using general economic theory. The most important factors are: inflation rate [*IR*], domestic and foreign direct investments [*DI, FDI*], size of the population [*POP*], human capital, measured as average schooling years per capita [*SPC*], participation rate on labour market [*LPA*], public spending on consumption [*PCGDP*]) as well as the size of the shadow economy [*SE*]. Applying this we get the following regression equation:

Regression model:

$$
\begin{aligned}
\ln GGDPPC_t = {} & \beta_0 + \beta_1 \times \ln GGDPPC_{t-1} + \beta_2 \times IR_t + \beta_3 \times \ln DI_t + \beta_4 \times \ln FDI_t \\
& + \beta_5 \times \ln POP_t + \beta_6 \times SPC_t + \beta_7 \times LPA_t + \beta_8 \times PCGDP_t + \beta_9 \times SE_t + u_t \qquad (3)
\end{aligned}
$$

According to general economic growth theory, the expected signs of the regression coefficients of the independent variables are positive for the lagged endogenous variable (*GGDPPC*), domestic and foreign direct investments (*DI, FDI*), total population (*POP*), average schooling per capita (*SPC*) and the participation rate on the labour market (*LPA*), whereas the signs of the coefficients for inflation rate (*IR*) and government consumption (*PCGDP*) are negative.

Equation (3) has been estimated using several variations of the independent variable shadow economy: The first one uses the simulations on the size of the shadow economy calculated from the regression results of the first model, variants 1a and 1b (variable: ratio of cash holdings to checkable deposits) and the second variation uses the estimations from model 2, variants 2a and 2b, based on the currency demand per capita. Therefore, in total, four regressions have been run to estimate the influence of the shadow economy on official economic growth.

4.2. *Econometric results*

The results are shown in Table 4.1, detailed ones (including test-statistics) are presented in appendix B.3. The estimated coefficients, in general, show the expected signs. Capital investments and total population have a positive and statistically significant effect on economic growth which is in line with economic growth theory. Foreign direct investment, the participation rate on the labour market and average years of schooling per capita also influence growth positively, although they do not show high statistical significance in all model variations. The price level and governmental consumption spending have the expected negative effect on economic growth and are highly statistically significant in all cases.

Table 4.1:Empirical results estimating the effect of the shadow economy on economic growth in Colombia, 1983-2002.

	regressions based on size of the shadow economy calculated from estimation results of			
	model 1		model 2	
Growth of real GDP per capita (yearly, %)	var. A	var. B	var. A	var. B
Growth of real GDP per capita %, lagged 1 year	-0.121725	-0.268726	-0.027391	-0.059163
Consumer price index	-0.000856 *	-0.000688 *	-0.000586 *	-0.000614 *
Domestic investments (ln)	0.035806 *	0.042470 *	0.030552 *	0.034698 *
Foreign direct investments (ln)	0.011613 *	0.002667	0.001436	0.000698
Total population (ln)	0.330641 *	0.417668	0.097455 *	0.134956 *
Participation rate on the labour market	0.427518	0.114300	0.318017 *	0.274949
Average schooling per capita	0.010578	0.010302	0.017800 *	0.015583
Public spending on consumption (% of GDP)	-1.269864 *	-1.679029 *	-0.867282 *	-0.964133 *
Constant	-6.463802 *	-7.751374	-2.302499 *	-2.935943
Size of shadow economy (% of GDP) - based on estimations model 1	0.203905 *	0.217251 *		
Size of shadow economy (% of GDP) - based on estimations model 2			0.203316 *	0.205652 *
* significant on 5 % level				

Source: Own calculations. See appendix B.3 for a more detailed listing of the regression results.

For the most interesting independent variable, the shadow economy, the regression results show a quantitatively substantial and statistically highly significant positive influence on GDP growth: An increase in the size of the shadow economy by one percentage point (measured in percent of GDP), leads to a rise of the growth rate of real GDP per capita by between 0.20 and 0.22 percentage points, ceteris paribus. The (standardized) beta-coefficients[16] also point out the relatively large influence of shadow economic activity on economic growth. As beta-coefficients allow for a direct comparison of the importance of the various estimated coefficients of the independent variables, we got the result that the shadow economy has a quantitatively larger effect on economic growth than investments, participation rate and the average educational level.

4.3. *Simulations on the relative and absolute influence of the shadow economy on economic growth*

Finally, we empirically determine the relative and absolute influence of the shadow economy for each year of our investigation; i.e. from 1983 to 2002. Applying a dynamic simulation, the difference between the official and the theoretical growth of real GDP per capita (the theoretical growth rate is corrected for the influence of the shadow economy) can be calculated: Multiplying the yearly variation of the estimated size of the shadow economy with its regression coefficient provides the concrete influence of the

---

[16] See appendix B.3 for details.

shadow economy on GDP growth for each year in percentage points. Taking these values one can easily calculate the absolute effects of the informal economy on economic growth. The corresponding simulation results are shown in Figure 4.1.

Figure 4.1: *Absolute and relative influence of the shadow economy on economic growth (of real GDP per capita) in Colombia, 1984-2002, 2-years-averages, in USD and percentage points.*
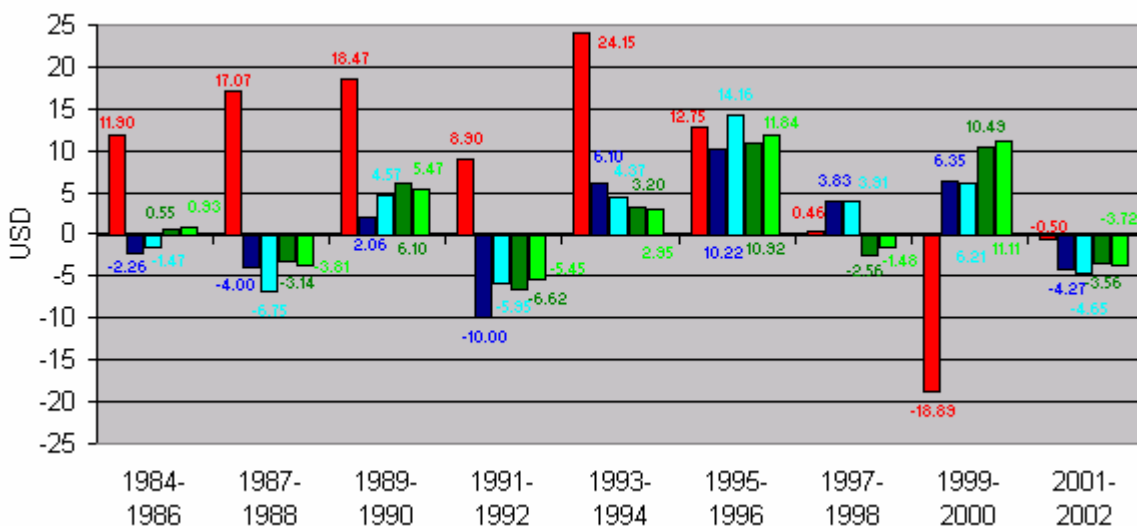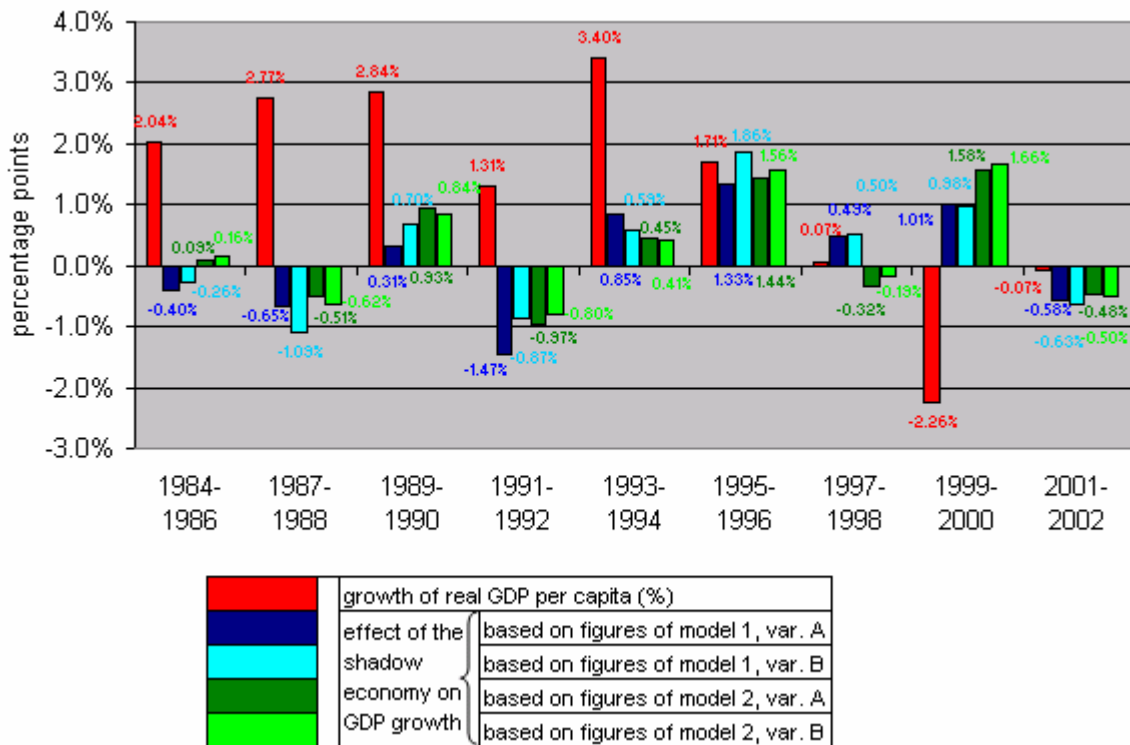
Source: Own calculations.

While average values of the growth of real GDP per capita vary between -2.3 and +3.4 % or -19 and +24 USD two periods, the average values of the relative and

absolute influences on growth by shadow economic activity lie between -1.47 and +1.86 percentage points and -10 and +14 USD respectively, which again shows the substantial effect of underground activity on economic growth. Due to the slight decrease of the size of the shadow economy in the 80s, there is a predominately negative contribution of the informal economy on growth in this period which changes into a positive one at the beginning of the 90s. Especially in the years 1999 and 2000 when the Colombian economy experienced its biggest recession of the 20th century the positive contribution of the shadow economy on economic growth seems to be particularly important. These results clearly demonstrate that especially during an economic crisis, shadow economy contributed to (partly) equalize the negative growth rates.

A simulation of the theoretical development of economic growth under exclusion of shadow economic effects makes it clear that the theoretical growth rates (except during the second half of the 80s) continuously lie below the officially recorded economic growth rates which include the influence of the shadow economy. The results are shown in Figure 4.2.

Figure..4.2.: Comparison of officially registered yearly growth rates of real GDP per capita in Colombia and simulated theoretical growth rates excluding the effects of shadow economic activity on growth, 1984-2002.
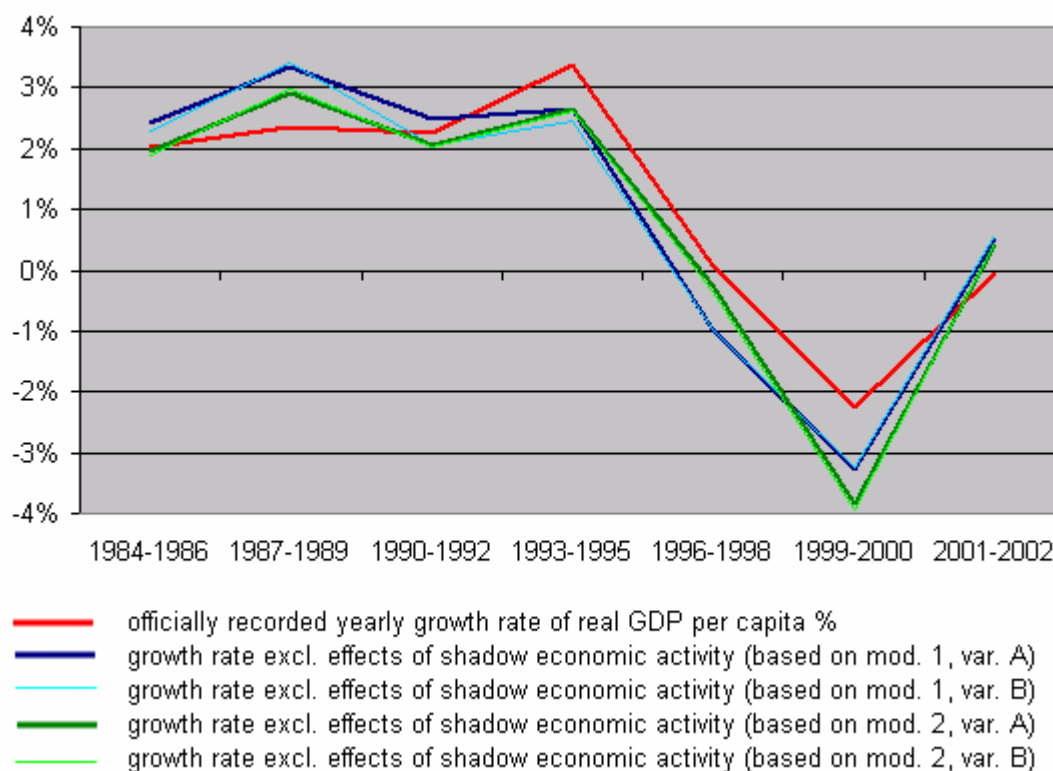
Source: Own calculations.

To underline this substantial influence on "official" economic growth caused by the informal economy, another simulation has been carried out which compares the development of the officially registered real GDP per capita and a simulated theoretical development of the GDP per capita corrected for the influence of the shadow economy. The results are shown in Figure 4.3. The basis for this simulation is the officially registered real GDP per capita in 1983. For the calculation of the theoretical development of real GDP per capita for the years until 2002, yearly growth rates were corrected for the effects of the shadow economy. They again demonstrate the great impact of the shadow economy by which the officially registered GDP per capita is influenced. The difference between the theoretical and the officially registered value is biggest in the period 1999 to 2000 when the Colombian economy experienced its major crisis of the 20th century. For the year 2000, the simulated real GDP per capita corrected for the effect of the shadow economy lies 37 USD below the officially registered one.

Figure 4.3: *Comparison of the development of the officially registered real GDP per capita and the simulated real GDP per capita corrected for shadow economic influences, Colombia, 1984-2002.*
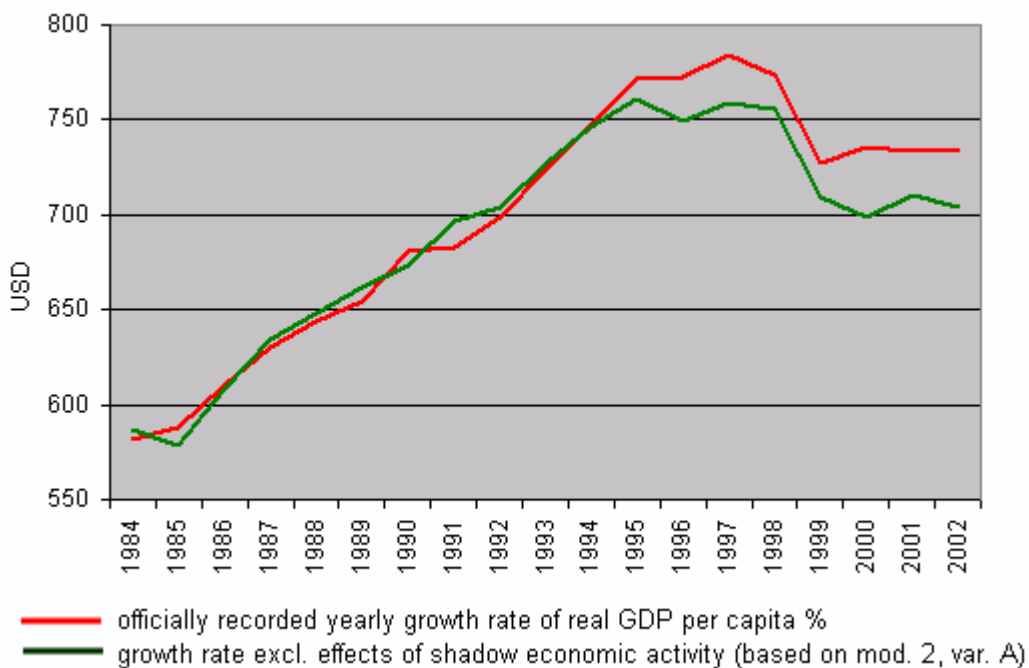
Source: Own calculations.

To sum up, all variations of the different simulations illustrate a significant positive impact of the shadow economy on economic growth in Colombia. Furthermore, the simulations on the absolute and relative effects demonstrate that the shadow economy

considerably contributes to (at least partially) offset negative growth rates in economic crises.

5. Summary and conclusion

Applying the currency demand approach, the first major finding of our paper is the large size of the shadow economy in Colombia, over the period from 1976 to 2002. After a slight decrease in the second half of the 80s, shadow economic activities have increased again in the last years (1995 to 2002) so that the shadow economy presently has reached a level of more than 50 % of real "official" GDP in Colombia. Our empirical analysis of the main causes for underground activities shows that on the one side rising unemployment has a great effect on the growth of the shadow economy, and on the other side we find a considerable influence caused by increases of direct and indirect taxation.

Our second major finding is the positive effect of the shadow economy on economic growth in Colombia. Our results demonstrate a clear positive relation between the size of the shadow economy and the growth rates of real GDP per capita: The average growth rate of real GDP per capita between 1977 and 2002 is 1.11 %, and an average between 0.07 and 0.27 percentage points of the growth is explained by shadow economic activities. The simulations also demonstrate that particularly during recessions, the shadow economy at least partly offsets the negative growth rates of the official economy.

Considering these two major findings we draw the following two conclusions:
(1) Even if our econometric estimates provide the clear result of a positive (i.e. stimulating) effect of the shadow economy on "official" economic growth, we are aware that there are still great latent potentials and productivities in the shadow economy which can not be (fully) used due to the generally low productivity of the shadow economic activities and restrictions on human and financial capital resources. This may be one of the reasons why Colombia keeps being classified as a developing country and why its economic standard is still relatively low compared to western industrialized OECD nations. Colombia's government is aware about these lost potentials by not using these underground productivities and has already implemented various programs to integrate the shadow economy in the official economy. We think it is reasonable to follow this strategy to benefit more from the shadow economic potentials.[17]

---

[17] For a further discussion of integration strategies see Tokman (2006) and Lubell (1991).

(2) Moreover, Colombia was one of the first countries, where the government actively began dealing with the problems and potentials of shadow economic activities. Already from the beginning of the 70s, Colombia's government has not only implemented strategies to integrate the shadow economy but also programs were set up to aim at the reduction of shadow economic activities. Unfortunately, these programs have not been of great success, mainly due to a lack of a long-term strategy and too little coordination of different programs.[18] One suggestion for a better coordination of the various programs dealing with the shadow economy could be the so-called "two-pillar strategy" which is an all-embracing approach on a macroeconomic basis aiming at a slow-down or reduction in shadow economic activities.[19]

---

[18] See for example O'Grady (2006) for a discussion of continuous drawbacks in taxation policy and Gracia/ Urdinola (2000) for a debate on changes in labour market regulations.
[19] For a detailed explanation of the two-pillar strategy consult Schneider/Enste (2002).

Appendix A: Currency demand approach

The currency demand approach was first used by Cagan (1958), who considered the correlation between the demand of currency and tax pressure (as one cause of the shadow economy) for the United States over the period 1919-1955. Twenty years later, Gutmann (1977) used the same approach but without any statistical procedures. Cagan's approach was further developed by Tanzi (1980, 1983), who econometrically estimated a currency demand function for the United States over the period 1929 to 1980 in order to calculate the size of the shadow economy. His approach assumes that shadow (or hidden) transactions are undertaken in the form of cash payments, so as to leave no observable traces for the authorities. An increase in the size of the shadow economy will therefore increase the demand for currency. To isolate the resulting excess demand for currency, an equation for currency demand is econometrically estimated over time. All conventional possible factors, such as the development of income, payment habits, interest rates, and so on, are controlled for. Additionally, such variables as the direct and indirect tax burden and government regulation, which are assumed to be the major factors causing people to work in the shadow economy, are included in the estimation equation. The basic regression equation for the currency demand, proposed by Tanzi (1983), is the following:

$$\ln(C/M_2)_t = \beta_0 + \beta_1 \ln(1+TW)_t + \beta_2 \ln(WS/Y)_t + \beta_3 \ln R_t + \beta_4 \ln(Y/N)_t + u_t$$

with $\beta_1>0$, $\beta_2>0$, $\beta_3<0$, $\beta_4>0$ where *ln* denotes natural logarithms. C/M_2 is the ratio of cash holdings to current and deposit accounts, *TW* is a weighted average tax rate (to proxy changes in the size of the shadow economy), *WS/Y* is a proportion of wages and salaries in national income (to capture changing payment and money holding patterns), *R* is the interest paid on savings deposits (to capture the opportunity cost of holding cash) and *Y/N* is the per capita income.[20] Any "excess" increase in currency, or the amount unexplained by the conventional or normal factors is then attributed to the rising tax burden and the other reasons leading people to work in the shadow economy. Figures for the size and development of the shadow economy can be calculated in a first step by comparing the difference between the development of currency when the direct and indirect tax burden and government regulation are held at lowest values, and the development of currency with the current (higher) burden of taxation and government regulation. Assuming in a second step the same income velocity for currency used in the shadow economy as for legal M1 in the official economy, the size of the shadow can be computed and compared to the official GDP. This is one of the most commonly used approaches. It has been applied to many OECD

---

[20] The estimation of such a currency demand equation has been criticized by Thomas (1999) but part of this criticism has been considered by the work of Giles (1999a,b) and Bhattacharyya (1999), who both use the latest economic techniques.

countries[21] but has nevertheless been criticized on various grounds.[22] The most commonly raised objections to this method are: (1) Not all transactions in the shadow economy are paid in cash. Isachsen and Strom (1985) used the survey method to find out that in Norway, in 1980, roughly 80 % of all transactions in the hidden sector were paid in cash. The size of the total shadow economy (including barter) may thus be even larger than previously estimated. (2) Most studies consider only one particular factor, the tax burden, as a cause of the shadow economy. But others (such as the impact of regulation, taxpayers' attitudes toward the state, tax morality and so on) are not considered, because reliable data for most countries is not available. If, as seems likely, these other factors also have an impact on the extent of the hidden economy, it might again be higher than reported in most studies.[23] (3) As discussed by Garcia (1978), Park (1979) and Feige (1996), increases in currency demand deposits are due largely to a slowdown in demand deposits rather than to an increase in currency caused by activities in the shadow economy, at least in the case of the United States. (4) Blades (1982) and Feige (1986, 1996) criticize Tanzi's studies on the grounds that the US dollar is used as an international currency so that Tanzi should have considered (and controlled for) the presence of US dollars, which are used as an international currency and held in cash abroad.[24] Frey and Pommerehne (1984) and Thomas (1986, 1992, 1999) claim that Tanzi's parameter estimates are not very stable.[25] (5) Most studies assume the same velocity of money in official and shadow economies. As argued by Hill and Kabir (1996) for Canada and by Klovland (1984) for the Scandinavian countries, there is considerable uncertainty about the velocity of money in the official economy, and the velocity of money in the hidden sector is even more difficult to estimate. Without knowledge about the velocity of currency in the shadow economy, one has to accept the assumption of an equal money

---

[21] See Karmann (1986, 1990), Schneider (1997, 1998a), Johnson et al. (1998a), and Williams and Windebank (1995).

[22] See Thomas (1992, 1999), Feige (1986), Pozo (1996), Pedersen (2003) and Ahumada et al. (2004).

[23] One (weak) justification for the only use of the tax variable is that this variable has by far the strongest impact on the size of the shadow economy in the studies known to the authors. The only exception is the study by Frey and Weck-Hannemann (1984) where the variable "tax immorality" has a quantitatively larger and statistically stronger influence than the direct tax share in the model approach. In the study of Pommerehne and Schneider (1985) for the US, besides various tax measures, data for regulation, tax immorality, minimum wage rates are available, the tax variable has a dominating influence and contributes roughly 60-70 % to the size of the shadow economy. See also Zilberfarb (1986).

[24] Another study by Tanzi (1982, esp. pp. 110-113) explicitly deals with this criticism. A very careful investigation of the amount of US dollars used abroad and US currency used in the shadow economy and for "classical" crime activities has been undertaken by Rogoff (1998), who concludes that large denomination bills are a major driving force for the growth of the shadow economy and classical crime activities, due largely to reduced transactions costs.

[25] However in studies for European countries Kirchgässner (1983, 1984) and Schneider (1986) conclude that the estimation results for Germany, Denmark, Norway and Sweden are quite robust when using the currency demand method. Hill and Kabir (1996) find for Canada that the rise of the shadow economy varies with respect to the tax variable used; they conclude "when the theoretically best tax rates are selected and a range of plausible velocity values is used, this method estimates underground economic growth between 1964 and 1995 at between 3 % and 11 % of GDP." (p. 1553).

velocity in both sectors. (6) Ahumada et al. (2004) show that the currency approach together with the assumption of equal income velocity of money in the reported and the hidden transaction is only correct if the income elasticity is 1. (7) Finally, the assumption of no shadow economy in a base year is open to criticism. Relaxing this assumption would again imply an upward adjustment of the size of the shadow economy.

Appendix B

Table 1.1. Description of the variables used in the discussed regression models

Variable		Obs	Mean	Std. Dev.	Min	Max	source [26]
name	label						
CDC	currency demand per capita in COP (Colombian Pesos)[27]	27	38,122.05	50,830.49	650.3	181,608.1	[2], [5]
CD	ratio of cash holdings to checkable deposits	27	0.5088889	0.1580003	0.33	0.89	[2], [5], o.c.
GDPPC	real GDP per capita in COP	27	1,577,542	194,672.2	1,267,760	1,871,851	[4]
IRD	yearly average interest rate on deposits at 90 days sight	27	0.2859259	0.083861	0.09	0.40	[5]
TY	average net tax rate on income	27	0.2455556	0.043175	0.19	0.32	[1]
TC	average net tax rate on consumption	27	0.1244444	0.021363	0.09	0.17	[1]
UNEMP	unemployment rate	27	0.1081481	0.027321	0.07	0.17	[3], [4]
ICD	cumulative real value of imported cash despensers, 20 % depreciation per year deducted	27	181,005.8	233,902	1,233	667,015	[1]
EPE	real expenditures for public employees in % of GDP	27	0.1181481	0.014945	0.09	0.15	[5]
GGDPPC	yearly growth of real GDP per capita in %	27	0.0131667	0.023332	-0.0596	0.0566	[4]
IR	consumer price index, basis: Dec. 1998	27	37.57852	43.89995	0.91	133.53	[2]

---

[26] Souces: see numbers in listing of empirical sources; o. c. = own calculations NUMBERS ARE MISSING!!

[27] used exchange rate in this paper: average market rate Jan.-July 2006 = 2,388.50 COP/USD

DI	real capital investment, Mio COP	27	115,250.7	36,346.76	68,039	186,646	[5]
FDI	foreign direct investment, Mio USD	27	1,119.02	1,264.427	25	5,562.22	[6]
SPC	average years of schooling per capita	27	6.164815	0.810362	4.89	7.57	[5]
LPA	participation rate on labour market	27	0.5711111	0.037655	0.50	0.62	[3], [4]
POP	Colombian total population	27	3.45e+07	5,739,490	2.47e+07	4.38e+07	[5]
PCGDP	public spending on consumption in % of nominal GDP	27	0.1092593	0.038323	0.06	0.18	[5]
SE1A	size of shadow economy in % of real GDP (estimation results model 1 - var A)	27	0.39404	0.118398	0.18606	0.62144	o. c.
SE1B	size of shadow economy in % of real GDP (estimation results model 1 - var B)	27	0.28722	0.142058	0.0969	0.5606	o. c.
SE2A	size of shadow economy in % of real GDP (estimation results model 2 - var A)	27	0.34918	0.114905	0.18937	0.6012	o. c.
SE2B	size of shadow economy in % of real GDP (estimation results model 2 - var B)	27	0.29137	0.125021	0.1101	0.56772	o. c.

B.2. Detailed regression results using the currency demand method

Table 2.1: Model 1; endogenous variable – ratio of cash holdings to checkable deposits

>> Variant 1a (separate variables for direct and indirect taxation included)

```
Regression with robust standard errors          Number of obs =       27
                                                F(  7,    19) =    50.98
                                                Prob > F      =   0.0000
                                                R-squared     =   0.9452
                                                Root MSE      =   .04325

-----------------------------------------------------------------------------
          |              Robust                                     standard.
       CD |    Coef.   Std. Err.     t    P>|t|   [95% Conf. Interval]  Beta-Coef.
----------+------------------------------------------------------------------
  lnGDPPC |  .2590352  .1936412    1.34   0.197   -.1462604   .6643308   0.2036661
      IRD | -.1580274  .1518791   -1.04   0.311    -.475914   .1598593  -0.083876
    lnICD |  -.002155  .0100273   -0.21   0.832   -.0231423   .0188323  -0.035066
       TY |  .5357451  .5313814    1.01   0.326    -.576449   1.647939   0.146398
       TC |  2.382126  .8315084    2.86   0.010    .6417592   4.122493   0.3220954
    UNEMP |  2.722735  .5876241    4.63   0.000    1.492824   3.952647   0.4708088
      EPE | -.0370014  .9748965   -0.04   0.970   -2.077483    2.00348   -0.0035
    _cons |  -3.83715  2.588247   -1.48   0.155   -9.254414   1.580114        -
-----------------------------------------------------------------------------

  Durbin-Watson d-statistic (   8,    27) = 1.918566

  test TY+TC+UNEMP+EPE=0                    test TY+TC+UNEMP=0
      F (  1,    19) =    38.05                F(  1,    19) =    51.27
           Prob > F =     0.0000                   Prob > F =    0.0000
```

>> Variant 1b (only one overall (additive) tax variable included)

```
Regression with robust standard errors          Number of obs =       27
                                                F(  6,    20) =    41.62
                                                Prob > F      =   0.0000
                                                R-squared     =   0.9389
                                                Root MSE      =   .04454

-----------------------------------------------------------------------------
          |            Semi-robust                                   standard.
       CD |    Coef.   Std. Err.     t    P>|t|   [95% Conf. Interval] Beta-Coef.
----------+------------------------------------------------------------------
  lnGDPPC |  .3618224  .1683473    2.15   0.044    .0106561   .7129888   0.2844824
      IRD | -.1909795  .1570723   -1.22   0.238   -.5186265   .1366676  -0.1013659
    lnICD | -.0106367  .0078271   -1.36   0.189   -.0269638   .0056903  -0.1730783
        T |  1.195981  .3422261    3.49   0.002    .4821099   1.909852   0.4680292
    UNEMP |  2.432499  .6088839    4.00   0.001     1.16239   3.702609   0.4206219
      EPE |  .4260926  .9807576    0.43   0.669   -1.619732   2.471917   0.0403042
    _cons | -5.246178  2.248711   -2.33   0.030   -9.936908  -.5554484        -
-----------------------------------------------------------------------------
```

Table 2.2: _Model 2; endogenous variable – currency demand per capita_

>> Variant 2a (separate variables for direct and indirect taxation included)

```
ARIMA regression

Sample:  1976 to 2002                        Number of obs    =         27
                                             Wald chi2(8)     = 271238.13
Log pseudo-likelihood =  8.573172            Prob > chi2      =    0.0000
------------------------------------------------------------------------------------
                     Semi-robust                                         standard.
lnCDC    |    Coef.   Std. Err.     z    P>|z|    [95% Conf. Interval] Beta-Coef.
---------+--------------------------------------------------------------------------
lnCDC    |
lnGDPPC  |  5.298315  1.399603    3.79   0.000    2.555144   8.041486   .3792613
IRD      | -.5446494   .6256279  -0.87   0.384   -1.770858    .6815588  -.0262058
lnICD    |  .0088995   .0346624   0.26   0.797   -.0590376   .0768365    .013079
TY       |   2.35494  1.824497    1.29   0.197   -1.221008   5.930889   .0583881
TC       |  3.080664  2.629585    1.17   0.241   -2.073228   8.234556   .0378249
UNEMP    |  5.130851  2.031338    2.53   0.012    1.149503    9.1122    .0806783
EPE      | -2.598264  2.957582   -0.88   0.380   -8.395017    3.19849  -.0223726
_cons    | -67.39862  19.66135   -3.43   0.001   -105.9342  -28.86308
---------+--------------------------------------------------------------------------
ARMA     |
ar       |
     L1  |  .9940802   .0024803 400.78   0.000    .9892189   .9989416
---------+--------------------------------------------------------------------------
 /sigma  |  .1622421   .0194285   8.35   0.000    .1241629   .2003212

 test TY+TC+UNEMP+EPE=0                    test TY+TC+UNEMP=0
        chi2( 1) =     2.33                       chi2( 1) =     8.86
        Prob > chi2 =    0.1271                    Prob > chi2 =    0.0029
```

>> Variant 2b (only one overall (additive) tax variable included)

```
ARIMA regression
Sample:  1976 to 2002                        Number of obs    =         27
                                             Wald chi2(7)     = 251439.16
Log pseudo-likelihood =  8.554679            Prob > chi2      =    0.0000
------------------------------------------------------------------------------------
         |           Semi-robust                                        standard.
lnCDC    |    Coef.   Std. Err.     z    P>|z|   [95% Conf. Interval]   Beta-Coef.
---------+--------------------------------------------------------------------------
lnCDC    |
lnGDPPC  |   5.33385    1.4303     3.73   0.000    2.530513   8.137186    0.3815456
IRD      | -.5517756   .6320718   -0.87   0.383   -1.790614    .6870624  -0.0266448
lnICD    |   .008133    .034998    0.23   0.816   -.0604617   .0767278    0.0120401
T        |  2.608898  1.368292    1.91   0.057   -.0729057   5.290701    0.0928861
UNEMP    |  5.172192  2.083354    2.48   0.013    1.088894    9.25549    0.0813690
EPE      | -2.713188   2.84284    -0.95   0.340   -8.285052   2.858675   -0.0233492
_cons    |  -67.8917  20.08801   -3.38   0.001   -107.2635  -28.51991         -
---------+--------------------------------------------------------------------------
ARMA     |
ar       |
     L1  |  .9940831   .0025212  94.29   0.000    .9891417   .9990245
---------+--------------------------------------------------------------------------
 /sigma  |  .1623439   .0191869   8.46   0.000    .1247383   .1999494
```

All models have been tested for structural continuity, as substantial policy changes in 1991 (passing of a new constitution, beginning of a more open economic policy with important changes in legislation regarding the labour market etc.) might have caused a structural break in Colombia. The results of a common Chow test for structural discontinuity are the following:

model	variant	F-value	p-value
1	a	1.3554575	0.29259339
1	b	1.7000926	0.18156576
2	a	1.6145011	0.20611913
2	b	2.2105135	0.09274099

As the p-values are high enough, it is suspected that the events in 1991 do not influence the regression results significantly, therefore the estimations are kept as already presented above.

B.3. Detailed regression results on the effect of the shadow economy on economic growth

Table 3.1: Variant 1:

(i)based on estimation results for the size of the shadow economy of model 1A

```
Sample:  1983 to 2002                    Number of obs    =         20
                                         Wald chi2(10)    =   5.20e+13
Log pseudo-likelihood =   71.5773        Prob > chi2      =     0.0000
```

GGDPPC	Coef.	Semi-robust Std. Err.	z	P>|z|	[95% Conf. Interval]		standard. Beta-Coef.
GGDPPC							
GGDPPC							
L1	-.1217248	.1512111	-0.80	0.421	-.4180932	.1746436	-0.1306
IR	-.0008558	.0002551	-3.35	0.001	-.0013558	-.0003558	-1.6504
lnDI	.0358059	.0109654	3.27	0.001	.0143141	.0572978	0.3878
lnFDI	.0116132	.005427	2.14	0.032	.0009765	.0222499	0.4261
lnPOP	.3306413	.0276261	11.97	0.000	.2764952	.3847874	1.5625
SPC	.0105779	.0079799	1.33	0.185	-.0050624	.0262183	0.2786
LPA	.4275179	.2270066	1.88	0.060	-.0174069	.8724426	0.4301
PCGDP	-1.269864	.2072349	-6.13	0.000	-1.676037	-.8636913	-2.1132
SE1A	.2085536	.0472784	4.41	0.000	.1158897	.3012176	0.9666
_cons	-6.463802	.5572105	-11.60	0.000	-7.555914	-5.371689	-
ARMA							
ma							
L1	-1	.0001245	-8031.45	0.000	-1.000244	-.9997562	
/sigma	.0062579	.000727	8.61	0.000	.004833	.0076827	

Chow test for structural discontinuity in 1991 (H0: no discontinuity):
F-value=0. 88371126, p-value=0. 63556824

(ii) based on estimation results for the size of the shadow economy of model 1B

```
Sample:  1983 to 2002                    Number of obs    =         20
                                         Wald chi2(10)    =   4.41e+11
Log pseudo-likelihood =   69.30319       Prob > chi2      =     0.0000
```

GGDPPC	Coef.	Semi-robust Std. Err.	z	P>|z|	[95% Conf. Interval]		standard. Beta-Coef.
GGDPPC							
GGDPPC							
L1	-.2687259	.280635	-0.96	0.338	-.8187604	.2813087	-0.28826
IR	-.0006876	.000296	-2.32	0.020	-.0012678	-.0001075	-1.32602
lnDI	.0424703	.0156743	2.71	0.007	.0117492	.0731914	0.460033
lnFDI	.0026674	.0046657	0.57	0.568	-.0064772	.011812	0.097866
lnPOP	.4176676	.2418146	1.73	0.084	-.0562803	.8916155	1.973702
SPC	.0103017	.0130017	0.79	0.428	-.0151812	.0357846	0.271373
LPA	.1142996	.2766075	0.41	0.679	-.4278411	.6564403	0.114994
PCGDP	-1.679029	.6307075	-2.66	0.008	-2.915193	-.4428646	-2.79415
SE1B	.2172506	.091927	2.36	0.018	.037077	.3974242	1.177838
_cons	-7.751374	4.131298	-1.88	0.061	-15.84857	.3458222	-
ARMA							
ma							
L1	-1.000004	.0006324	-1581.40	0.000	-1.001244	-.9987649	
/sigma	.0070114	.0009107	7.70	0.000	.0052264	.0087964	

Table 3.2: Variant 2:

(i)based on estimation results for the size of the shadow economy of model 2A

```
Sample:  1983 to 2002                          Number of obs     =
                                               Wald chi2(10)     =  2.00e+
Log pseudo-likelihood =   73.00714             Prob > chi2       =    0.00
```

GGDPPC	Coef.	Semi-robust Std. Err.	z	P>|z|	[95% Conf. Interval]		standard. Beta-Coef.
GGDPPC							
GGDPPC							
L1	-.027391	.1051994	-0.26	0.795	-.233578	.178796	-0.0294
IR	-.0005856	.0001874	-3.12	0.002	-.000953	-.0002183	-1.1293
lnDI	.0305523	.0097423	3.14	0.002	.0114576	.0496469	0.3309
lnFDI	.0014362	.003892	0.37	0.712	-.0061919	.0090643	0.0527
lnPOP	.0974547	.0065177	14.95	0.000	.0846802	.1102292	0.4605
SPC	.0177995	.0086457	2.06	0.040	.0008543	.0347447	0.4689
LPA	.3180173	.133018	2.39	0.017	.0573068	.5787279	0.3199
PCGDP	-.8672816	.1561588	-5.55	0.000	-1.173347	-.561216	-1.4433
SE2A	.2033162	.0467616	4.35	0.000	.1116652	.2949671	0.9089
_cons	-2.302499	.1699759	-13.55	0.000	-2.635645	-1.969352	–
ARMA							
ma							
L1	-1	.0001773	-5640.99	0.000	-1.000348	-.9996527	
/sigma	.0058262	.0006829	8.53	0.000	.0044877	.0071647	

Chow test for structural discontinuity in 1991 (H0: no discontinuity):
F-value= 0.99757368, p-value= 0.59546122

(ii)based on estimation results for the size of the shadow economy of model 2B

```
Sample:  1983 to 2002                          Number of obs     =       20
                                               Wald chi2(10)     =  2.10e+14
Log pseudo-likelihood =   72.30479             Prob > chi2       =   0.0000
```

GGDPPC	Coef.	Semi-robust Std. Err.	z	P>|z|	[95% Conf. Interval]		standard. Beta-Coef.
GGDPPC							
GGDPPC							
L1	-.0591626	.1020636	-0.58	0.562	-.2592037	.1408784	-0.0635
IR	-.0006138	.0002065	-2.97	0.003	-.0010186	-.000209	-1.1837
lnDI	.0346977	.0095939	3.62	0.000	.015894	.0535014	0.3758
lnFDI	.0006981	.0040237	0.17	0.862	-.0071881	.0085843	0.0256
lnPOP	.1349563	.0064384	20.96	0.000	.1223372	.1475753	0.6377
SPC	.0155825	.0092332	1.69	0.091	-.0025143	.0336794	0.4105
LPA	.2749487	.153823	1.79	0.074	-.0265388	.5764363	0.2766
PCGDP	-.9641328	.1563503	-6.17	0.000	-1.270574	-.6576918	-1.6045
SE2B	.2056523	.0511161	4.02	0.000	.1054667	.305838	1.0067
_cons	-2.935943	.	.	.	.	.	–
ARMA							
ma							
L1	-1	.0000296	.	0.000	-1.000058	-.9999423	
/sigma	.0060343	.0006947	8.69	0.000	.0046727	.007396	

Table 3.3: _Comparison of different simulations on the absolute and relative effect of the shadow economy on economic growth_

year	relative effect of shadow econonomy on growth of GDP per capita (percentage points)								min	max	variation
	SE1A	SE1B	SE1A5	SE1B5	SE2A	SE2B	SE2A5	SE2B5			
1984-1986	-0.40%	-0.26%	-0.56%	-0.11%	0.09%	0.16%	-0.25%	-0.06%	-0.56%	0.16%	0.72%
1987-1989	-0.99%	-1.04%	-0.95%	-1.08%	-0.56%	-0.62%	-0.66%	-0.62%	-1.08%	-0.56%	0.52%
1990-1992	-0.22%	0.19%	-0.30%	0.20%	0.19%	0.22%	0.27%	0.19%	-0.30%	0.22%	0.52%
1993-1995	0.72%	0.92%	0.48%	0.91%	0.73%	0.76%	0.06%	0.86%	0.48%	0.92%	0.44%
1996-1998	1.06%	1.05%	0.92%	1.08%	0.31%	0.42%	0.25%	0.60%	0.31%	1.08%	0.77%
1999-2000	1.01%	0.98%	1.12%	1.01%	1.58%	1.66%	1.63%	1.67%	0.98%	1.66%	0.68%
2001-2002	-0.58%	-0.63%	-0.51%	-0.67%	-0.48%	-0.50%	-0.49%	-0.37%	-0.67%	-0.48%	0.19%

year	absolute effect of shadow econonomy on growth of GDP per capita (USD)								min	max	variation
	SE1A	SE1B	SE1A5	SE1B5	SE2A	SE2B	SE2A5	SE2B5			
1984-1986	-2.26	-1.47	-3.20	-0.63	0.55	0.93	-1.43	-0.32	-3.20	0.93	4.13
1987-1989	-6.22	-6.49	-6.03	-6.72	-3.49	-3.83	-4.13	-3.86	-6.72	-3.49	3.22
1990-1992	-1.74	1.07	-2.23	1.14	1.05	1.31	1.63	1.04	-2.23	1.63	3.85
1993-1995	5.26	6.85	3.50	6.76	5.36	5.64	0.70	6.38	0.70	6.85	6.15
1996-1998	8.17	8.12	7.08	8.37	2.35	3.24	1.95	4.63	1.95	8.37	6.42
1999-2000	6.35	6.21	7.28	6.37	10.49	11.11	11.11	11.24	6.21	11.24	5.03
2001-2002	-4.27	-4.65	-3.76	-4.93	-3.56	-3.72	-3.67	-2.72	-4.93	-2.72	2.21

Estimations based on:

_SE1A:_ _size of the shadow economy calculated from results of regression model 1, var. A considering all variables included in the model for describing the shadow economy_

_SE1B:_ _size of the shadow economy calculated from results of regression model 1, var. B considering all variables included in the model for describing the shadow economy_

_SE1A5:_ _size of the shadow economy calculated from results of regression model 1, var. A only considering higly significant variables for describing the shadow economy_

_SE1B5:_ _size of the shadow economy calculated from results of regression model 1, var. B only considering higly significant variables for describing the shadow economy_

_SE2A:_ _size of the shadow economy calculated from results of regression model 2, var. A considering all variables included in the model for describing the shadow economy_

_SE2B:_ _size of the shadow economy calculated from results of regression model 2, var. A considering all variables included in the model for describing the shadow economy_

_SE2A5:_ _size of the shadow economy calculated from results of regression model 2, var. A only considering higly significant variables for describing the shadow economy_

_SE2B5:_ _size of the shadow economy calculated from results of regression model 2, var. B only considering higly significant variables for describing the shadow economy_

BIBLIOGRAPHY

Ahumada, H., Facundo, A., Canavese, A., Canavese, P. (2004): The demand for currency approach and the size of the shadow economy: a critical assessment; Discussion Paper; Paris: Delta Ecole Normal Superieure.

Alm, J. (1996): Explaining Tax Compliance; in: Pozo, S. (Ed.): Exploring the underground economy – Studies of illegal and unreported activity; Michigan: W.E. Upjohn Institute for Employment Research.

Besozzi, C. (2001): Illegal, legal – egal?: Zu Entstehung, Struktur und Auswirkungen illegaler Märkte; Bern / Stuttgart / Wien: Haupt.

Bhattacharyya, D.K. (1999): On the economic rationale of estimating the hidden economy; Economic Journal 109; 348-359.

Blades, D. (1982): The hidden economy and the national accouts; OECD Occasional Studies; 28-44.

Cagan, P. (1958): The demand for currency relative to the total money supply; Journal of Political Economy 66; 302-328.

Del'Anno, R. (2003): Estimating the shadow economy in Italy: a structural equation approach; Discussion Paper; Department of Economics and Statistics, University of Salerno.

Del'Anno, R., Schneider, F. (2004): The shadow economy of Italy and other OECD countries: what do we know?; Discussion Paper; Department of Economics, University of Linz.

Enste, D. H. (2005): The Shadow Economy in OECD and EU Accession Countries – Empirical Evidence for the Influence of Institutions, Liberalization, Taxation and Regulation; in: Bajada C., Schneider F. (Eds.): Size, Causes and Consequences of the Underground Economy – An International Perspective; Hants / Burlington: Ashgate Publishing Company.

Feige, E.L. (1986): A re-examination of the "underground economy" in the United States; IMF Staff Papers 33; 768-781.

Feige, E. L. (1989): The underground economies: tax evasion and information distortion; Cambridge et al.: Cambridge University Press.

Feige, E.L. (1994): The underground economy and the currency enigma; Supplement to Public Finance/Finances Publiques 49; 119-136.

Feige, E.L. (1996): Overseas holdings of U.S. currency and the underground economy; in: Pozo, S. (Ed.): Exploring the underground economy – Studies of illegal and unreported activity; Michigan: W.E. Upjohn Institute for Employment Research.

Fleming M., Roman J., Farrell G. (2000): The shadow economy; Journal of International Affairs, Spring 2000, 53, No. 2, S. 387-412.

Frey, B.S. (1989): How large (or small) should the underground economy be?; in: Feige, E. L. (Ed.): The underground economies: tax evasion and information distortion; Cambridge et al.: Cambridge University Press.

Frey, B.S., Pommerehne, W.W. (1984): The hidden economy: state and prospect for measurement; Review of Income and Wealth 30; 1-23.

Frey, B.S., Weck-Hannemann, H. (1984): The hidden economy as an "unobserved" variable; European Economic Review 26; 33-53.

Garcia, G. (1978): The currency ratio and the subterranean economy; financial Analysts Journal 69; 64-66.

Gijsel, P. (1984): Effektive Nachfrage und illegale Beschäftigung – Zum Zusammenhang zwischen Arbeitslosigkeit und Schattenwirtschaft; in Gijsel, P. (Ed.): Schattenwirtschaft und alternative Ökonomie: Eine Herausforderung für die politische Ökonomie?; Regensburg: Transfer Verlag.

Giles, D.E.A. (1999a): Measuring the hidden economy: implications for econometric modeling; Economic Journal 109; 370-380.

Giles, D.E.A. (1999b): Modeling the hidden economy in the tax gap in New Zealand; Empirical Economics 24; 621-640.

Gracia O., Urdinola P. (2000): Una mirada al mercado laboral colombiano; Departamento Nacional de Planeación, Unidad de análisis macroeconómico, Santafé de Bogotá.

Gretschmann, K. (1984): Schattenwirtschaft, Staatstätigkeit und Finanzwissenschaft – Einige theoretische Überlegungen; in Gijsel, P. (Ed.): Schattenwirtschaft und alternative Ökonomie: Eine Herausforderung für die politische Ökonomie?; Regensburg: Transfer Verlag.

Gutmann, P.M. (1977): The subterranean economy; Financial Analysts Journal 34 (1); 24-27.

Haslinger, F. (1984): Illoyalität und die Ausbreitung der Untergrundwirtschaft – Eine theoretische Analyse; in Gijsel, P. (Ed.): Schattenwirtschaft und alternative Ökonomie: Eine Herausforderung für die politische Ökonomie?; Regensburg: Transfer Verlag.

Hill, R., Kabir, M. (1996): Tax rates, the tax mix, and the growth of the underground economy in Canada: what can we infer?; Canadian Tax Journal/Revue Fiscale Canadienne 44; 1552-1583.

Isachsen, A.J., Strom, S. (1985): The size and growth of the hidden economy in Norway; Review of Income and Wealth 31; 21-38.

Johnson, S., Kaufmann, D., Zoido-Lobatón, P. (1998a): Regulatory discretion and the unofficial economy; The American Economic Review 88; 387-392.

Johnson, S., Kaufmann, D., Zoido-Lobatón, P. (1998b): Corruption, public finances and the unofficial economy; Discussion paper; Washington DC: The World Bank.

Karmann, A. (1986): Monetäre Ansätze zur Erfassung der Schattenwirtschaft: Ein Vergleich verschiedener Messansätze; Kredit und Kapital 19; 233-247.

Karmann, A. (1990): Schattenwirtschaft und ihre Ursachen: Eine empirische Analyse zur Schwarzwirtschaft und Selbstversorgung in der Bundesrepublik Deutschland; Zeitschrift für Wirtschafts- und Sozialwissenschaften (ZWS) 110; 185-206.

Kirchgässner, G. (1983): Size and development of the West German shadow economy, 1955-1980; Zeitschrift für die Gesamte Staatswissenschaft 139; 197-214.

Kirchgässner, G. (1984): Verfahren zur Erfassung des in der Schattenwirtschaft erarbeiteten Sozialprodukts; Allgemeines Statistisches Archiv 68; 378-405.

Kirchgässner, G. (2006): Steuermoral und Schwarzarbeit; in Enste, H. D., Schneider, F. (Ed.): Jahrbuch Schattenwirtschaft 2006/2007; Berlin: LIT Verlag.

Klovland, J. (1984): Tax evasion and the demand for currency in Norway and Sweden: is there a hidden relationship?; Scandinavian Journal of Economics 86; 423-439.

Lippert, O., Walker, M. (1997): The Underground Economy: Global Evidences of its Size and Impact; Vancouver, BC: The Frazer Institute.

Lubell, H. (1991): The informal sector in the 1980s and 1990s; Paris: Development centre of the organisation for economic co-operation and development, Publications Service OECD.

McGee, R. T., Feige, E. L. (1989): Policy illusion, macroeconomic instability, and the unrecorded economy; in: Feige, E. L. (Ed.): The underground economies: tax evasion and information distortion; Cambridge et al.: Cambridge University Press.

O'Grady, M.A. (2006): Una ventana de oportunidad para Colombia; Portafolio, 06/2006; http://www.portafolio.com.co/port_secc_online/porta_ana_online/2006-06-12/ARTICULO-WEB-NOTA_INTERIOR_PORTA-2943805.html; Download: 16.08.2006.

Park, T. (1979): Reconciliation between Personal Income and Taxable Income; Washington, DC: Bureau of Economic Analysis; pp. 1947-1977.

Pedersen, S. (2003): The shadow economy in Germany, Great Britain and Scandinavia: A measurement based on questionnaire service; study no. 10; Copenhagen: The Rockwool Foundation Research Unit.

Pommerehne, W.W., Schneider, F. (1985): The decline of productivity growth and the rise of the shadow economy in the U.S.; Working Paper 85-9; University of Aarhus.

Pozo, S. (Ed.) (1996): Exploring the underground economy – Studies of illegal and unreported activity; Michigan: W.E. Upjohn Institute for Employment Research.

Rogoff, K. (1998): Blessing or curse? Foreign and underground demand for euro notes; Economic Policy: The European Forum 26, 261-304.

Schneider, F. (1986): Estimating the size of the Danish shadow economy using the currency demand approach: an attempt; The Scandinavian Journal of Economics 88, 643-668.

Schneider, F. (1994a): Measuring the size and development of the shadow economy: can the causes be found and the obstacles be overcome?; in: Brandstaetter, H., Güth, W. (Eds.), Essays on Economic Psychology; Berlin: Springer; pp. 193- 212.

Schneider, F. (1994b): Can the shadow economy be reduced through major tax reforms? An empirical investigation for Austria; Supplement to Public Finance/Finances Publiques 49; 137-152.

Schneider, F. (1997): The shadow economies of Western Europe; Journal of the Institute of Economic Affairs 17; 42-48.

Schneider, F. (1998a): Further empirical results of the size of the shadow economy of 17 OECD-countries over time; Paper Presented at the 54th Congress of the IIPF Cordova, Argentina, and Discussion Paper, Department of Economics, University of Linz.

Schneider, F. (1998b): Stellt das Anwachsen der Schwarzarbeit eine wirtschaftspolitische Herausforderung dar? Einige Gedanken aus volkswirtschaftlicher Sicht; Linz: Mitteilungen des Instituts für Angewandte Wirtschaftsforschung (IAW) I/98; 4-13.

Schneider, F. (2000): Arbeit im Schatten: Einige theoretische und empirische Überlegungen über die Schattenwirtschaft; Institut für Volkswirtschaftslehre, Johannes Kepler Universität Linz.

Schneider, F. (2003a): Stellt das Anwachsen der Schattenwirtschaft ein Problem für die Wirt-schafts- und Finanzpolitik dar? Einige vorläufige empirische Erkenntnisse.; Perspektiven der

Wirtschaftspolitik: Festschrift zum 65. Geburtstag von René L. Frey; www.economics.uni-linz.ac.at/Schneider/FestschriftFrey.pdf; Download: 05.07.2006.

Schneider, F. (2003b): The shadow economy; in: Rowley, C.K., Schneider, F. (Eds.): Encyclopedia of Public Choice; Dordrecht: Kluwer Academic Publishers.

Schneider, F. (2005): Shadow economies around the world: What do we really know?; European Journal of Political Economy, vol. 21, no. 3, sept. 2005, S. 598-642; Amsterdam et al.: Elsevier.

Schneider, F. (2006): Shadow economies and Corruption of 145 countries all over the world: What do we really know?; Discussion Paper, Institut für Volkswirtschaftslehre, Johannes Kepler Universität Linz.

Schneider, F., Enste, D. (2002): The Shadow Economy – An International Survey; Cambridge: Cambridge University Press.

Smith, P. (1994): Assessing the size of the underground economy: the Canadian statistical perspectives; Canadian Economic Observer 11; 16-33.

Spiro, P.S. (1993): Evidence of a post-GST increase in the underground economy; Canadian Tax Journal/Revue Fiscale Canadienne 41; 247-258.

Tanzi, V. (1980): The underground economy in the United States: estimates and implications; Banca Nazionale del Lavoro 135; 427-453.

Tanzi, V. (1982): The underground economies in the United States and Abroad; Lexington, MA: Lexington Books.

Tanzi, V. (1983): The underground economy in the United States: annual estimates, 1930-1980; IMF Staff Papers 30; 283-305.

Thomas, J.J. (1986): The underground economy in the United States: comment on Tanzi; IMF Staff Papers 33; 782-789.

Thomas, J.J. (1992): Informal Economic Activity; LSE Handbooks in Economics; London: Harvester Wheatsheaf.

Thomas, J.J. (1999): Quantifying the black economy: "measurement without theory" yet again?; Economic Journal 109; 381-389.

Tokman, V. E.: Integrating the informal sector in the modernization process; http://www.un.org/docs/ecosoc/meetings/2006/forum/statements/tokman.pdf; Download: 10.08.2006.

Wagner, H. (1984): Anmerkungen zum Übergang in die Schattenwirtschaft; in Gijsel, P. (Ed.): Schattenwirtschaft und alternative Ökonomie: Eine Herausforderung für die politische Ökonomie?; Regensburg: Transfer Verlag.

Williams, C.C., Windebank, J. (1995): Black market work in the European Community: peripheral work for peripheral localities?; International Journal of Urban and Regional Research 19; 23-39.

Witte, A., D. (1996): Beating the System?; in: Pozo, S. (Ed.): Exploring the underground economy – Studies of illegal and unreported activity; Michigan: W.E. Upjohn Institute for Employment Research.

Zilberfarb, B.-Z. (1986): Estimates of the underground economy in the United States, 1930-80; IMF Staff Papers 33; 790-798.

EMPIRICAL SOURCES

[1]   Arango, C., Misas, M., López, E. (2005): Economía Subterranea en Colombia 1976-2003 – Una medición a partir de la demanda de efectivo; Banco de la República de Colombia; http://www.banrep.gov.co/docum/ftp/borra335.pdf; Download: 29.01.2006.

[2]   Banco de la República de Colombia, www.banrep.gov.co

[3]   Colombia Viva (2000); El Tiempo; Santafé de Bogotá.

[4]   Departamento Administrativo Nacional de Estadística (DANE), www.dane.gov.co

[5]   Departamento Nacional de Planeación (DNP), www.dnp.gov.co

[6]   United Nations Conference on Trade and Development (UNCTAD), www.unctad.org

ARBEITSPAPIERE 1991-2007
des Instituts für Volkswirtschaftslehre, Johannes Kepler Universität Linz

9101 WEISS, Christoph: Price inertia and market structure under incomplete information. Jänner 1991. in: *Applied Economics*, 1992.

9102 BARTEL, Rainer: Grundlagen der Wirtschaftspolitik und ihre Problematik. Ein einführender Leitfaden zur Theorie der Wirtschaftspolitik. Jänner 1991; Kurzfassung erschienen unter: Wirtschaftspolitik in der Marktwirtschaft, in: *Wirtschaft und Gesellschaft,* 17. 1991,2, S. 229-249

9103 FALKINGER, Josef: External effects of information. Jänner 1991

9104 SCHNEIDER, Friedrich; Mechanik und Ökonomie: Keplers Traum und die Zukunft. Jänner 1991, in: R. Sandgruber und F. Schneider (Hrsg.), "*Interdisziplinarität Heute*", Linz, Trauner, 1991

9105 ZWEIMÜLLER, Josef, WINTER-EBMER, Rudolf: Manpower training programs and employment stability, in: *Economica*, 63. 1995, S. 128-130

9106 ZWEIMÜLLER, Josef: Partial retirement and the earnings test. Februar 1991, in: *Zeitschrift für Nationalökonomie / Journal of Economics*, 57. 1993,3, S. 295-303

9107 FALKINGER, Josef: The impacts of policy on quality and price in a vertically integrated sector. März 1991. Revidierte Fassung: On the effects of price or quality regulations in a monopoly market, in: *Jahrbuch für Sozialwissenschaft.*

9108 PFAFFERMAYR, Michael, WEISS, Christoph R., ZWEIMÜLLER, Josef: Farm income, market wages, and off-farm labour supply, in: *Empirica*, 18, 2, 1991, S. 221-235

9109 BARTEL, Rainer, van RIETSCHOTEN, Kees: A perspective of modern public auditing. Pleading for more science and less pressure-group policy in public sector policies. Juni 1991, dt. Fassung: Eine Vision von moderner öffentlicher Finanzkontrolle, in: *Das öffentliche Haushaltswesen in Österreich*, 32. 1991,3-4, S. 151-187

9110 SCHNEIDER, Friedrich and LENZELBAUER, Werner: An inverse relationship between efficiency and profitability according to the size of Upper--Austrian firms? Some further tentative results, in: *Small Business Economics*, 5. 1993,1, S. 1-22

9111 SCHNEIDER, Friedrich: Wirtschaftspolitische Maßnahmen zur Steigerung der Effizienz der österreichischen Gemeinwirtschaft: Ein Plädoyer für eine aktivere Industrie- und Wettbewerbspolitik. Juli 1991, in: *Öffentliche Wirtschaft und Gemeinwirtschaft in Österreich*, Wien, Manz, 1992, S. 90-114

9112 WINTER-EBMER, Rudolf, ZWEIMÜLLER, Josef: Unequal promotion on job ladders, in: *Journal of Labor Economics, 15. 1997,1,1, S. 70-71*

9113 BRUNNER, Johann K.: Bargaining with reasonable aspirations. Oktober 1991, in: *Theory and Decision,* 37, 1994, S 311-321.

9114 ZWEIMÜLLER, Josef, WINTER-EBMER, Rudolf: Gender wage differentials and private and public sector jobs. Oktober 1991, in: *Journal of Population Economics,* 7. 1994, S. 271-285

9115 BRUNNER, Johann K., WICKSTRÖM, Bengt-Arne: Politically stable pay-as-you-go pension systems: Why the social-insurance budget is too small in a democracy. November 1991, in: *Zeitschrift für Nationalökonomie = Journal of Economics*, 7. 1993, S. 177-190.

9116 WINTER-EBMER; Rudolf, ZWEIMÜLLER, Josef: Occupational segregation and career advancement. Dezember 1991, in: *Economics Letters*, 39. 1992, S. 229-234

***

9201 SCHNEIDER, Friedrich: Ecological objectives in a market economy: Three simple questions, but no simple answers? Jänner 1992, in: Giersch, H. (Hrsg.), *Environmental economics*, Heidelberg, Springer-Verl., 1993

9202 SCHNEIDER, Friedrich: The federal and fiscal structures of representative and direct democracies as models for a European federal union: Some preliminary ideas using the public-choice approach, in: *Journal des Economistes et des Etudes Humaines*, 3. 1993,2

9203 SCHNEIDER, Friedrich: The development of the shadow economy under changing economic conditions: Some tentative empirical results for Austria. Revised version. März 1992.

9204 HACKL, Franz, SCHNEIDER, Friedrich, WITHERS, Glenn: The public sector in Australia: A quantitative analysis. März 1992, in: Gemmell, N. (ed) *The growth of the public sector*, Aldershot, Elgar, 1993, S. 212-231

9205 SCHNEIDER, Friedrich: The federal and fiscal structures of western democracies as models for a federal union in former communist countries? Some thoughts using the public-choice approach. April 1992, in: Wagner, H.-J. (ed.), *On the theory and policy of systematic change*, Heidelberg, Springer-Verl., 1993, S. 135-154

9206 WINTER-EBMER, Rudolf: Endogenous growth, human capital, and industry wages. in: *Bulletin of Economic Research*, 4/1994, 289-314.

9207 BARTEL, Rainer: Gleichgewicht, Ungleichgewicht und Anpassung in der komparativen Statik. August 1992; 1. Teil erschienen unter: Auf welchen Grundlagen beruhen unsere ökonomischen Aussagen? in: *Wirtschaft und Gesellschaft*, 19, 2, 1993, S. 153-170; 2. Teil erschienen unter: Neoklassische Rationierung, in: *WiSt*, 23, 3, 1993, S. 151-154

9208 WEISS, Christoph R.: Market structure and pricing behaviour in Austrian manufacturing. August 1992. in: *Empirica*, 21. 1994, S. 115-131.

9209 WINTER-EBMER, Rudolf: Unemployment and individual pay: Wage curve or compen-sating differentials? erscheint u.d.T.: Wage Curve, Unemployment Duration and Compensating Differentials, in: *Labour Economics*, 3/1996,4, S. 425-434

9210 SCHUSTER, Helmut: Chaostheorie und Verkehrswissenschaft? September 1992, in: *Österreichische Zeitschrift für Verkehrswissenschaft*, 1-2, 38. 1992, S. 48-51

9211 BARTEL, Rainer, PRUCKNER, Gerald: Strukturelle und konjunkturelle Charakteristika der Budgetpolitik von Bund und Gesamtstaat in Österreich. Oktober 1992, in: *Wirtschaftspolitische Blätter*, 40. 1993,2, S. 134-154

9212 PFAFFERMAYR, Michael: Foreign direct investment and exports: A time series approach. Oktober 1992

9213 HACKL, Franz, SCHNEIDER, Friedrich: Austrian economic policy since 1945: An ex-ploratory analysis. Oktober 1992, in: Paldam, M. (ed.), *Economic development of small open economies in Europe and South America*, Basingstoke, Macmillan, forthcoming 1994

9214 SCHNEIDER, Friedrich: Die Kunst als Wirtschaftsfaktor - vernachlässigbar oder beach-tenswert? Oktober 1992, in: *Musicologica Austriaca*, 11. 1993,1, S. 19-29

9215 SCHNEIDER, Friedrich: Measuring the size and the development of the shadow economy: Can the causes be found and the obstacles be overcome? November 1992, in: Brandstätter, Hermann and Güth, W. (eds.), *Essays on Economic Psychology*, Heidelberg, Springer-Verl., 1994, S. 208-211

9216 SCHNEIDER, Friedrich: Public choice - economic theory of politics: A survey in selected areas. Dezember 1992, in: Brandstätter, Hermann and Güth, W. (eds.), *Essays on*

Economic Psychology, Heidelberg, Springer-Verl., 1994, S. 188-192

***

9301   SCHUSTER, Helmut: Energiepolitik im Spannungsfeld zwischen Wirtschaft und Umwelt. Jänner 1993, in: Friedrich Schneider (Hrsg.), *Energiepolitik in Österreich*, Linz, Trauner, 1993

9302   WINTER-EBMER, Rudolf: Motivation to migrate and economic success. März 1993, erscheint u.d.T.: Motivation for Migration and Economic Success, in: *Journal of Economic Psychology*, 15. 1994, S. 282-284

9303   LANDESMANN, Michael and GOODWIN, Richard: Productivity growth, structural change and macroeconomic stability. März 1993

9304   PFAFFERMAYR, Michael: Foreign outward direct investment and exports in Austrian manufacturing. März 1993

9305   BARTEL, Rainer: Zur Ökonomie der öffentlichen Finanzkontrolle. April 1993, erschienen unter: Öffentliche Finanzkontrolle als politische Machtkontrolle. Eine ökonomische Fundierung, in: *Politische Vierteljahresschrift*, 34. 1993,4, S. 613-639

9306   HACKL, Franz: Die Internalisierung von überbetrieblichen Leistungen der Landwirtschaft aus allokationstheoretischer Sicht. April 1993.

9307   ZWEIMÜLLER, Josef, WINTER-EBMER, Rudolf, FALKINGER, Josef: Retirement of spouses and social security reform, in: *European Economic Review*, 40/1996, S. 471-472

9308   BRUNNER, Johann K.: Abilities, needs, and the size of the cake: an axiomatic bargaining approach to redistributive taxation. Juli 1993.

9309   HACKL, Franz, PRUCKNER, Gerald: Touristische Präferenzen für den ländlichen Raum: Die Problematik ihrer empirischen Erfassung und Internalisierung. Juli 1993. Ersch. in: Gesellschaftliche Forderungen an die Landwirtschaft / Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues (GEWISOLA), hrsg. von Konrad Hagedorn ... 1994, Schriften der GEWISOLA, Bd. 30

9310   NECK, Reinhard, SCHNEIDER, Friedrich: Steuersystem und Schattenwirtschaft. Juli 1993.

9311   POINTNER, Johannes und SCHNEIDER, Friedrich: Österreich im internationalen Writschaftssystem, August 1993, in: Ewald Nowotny und Günther Winckler (Hrsg.), *Grundzüge der Wirtschaftspolitik Österreichs,* 1994.

9312   SCHNEIDER, Friedrich: The Relationship between efficiency and profitability with respect to the size of firms: an empirical investigation for Austria. September 1993.

9313   ÖTSCH, Walter: Die mechanistische Metapher in der Theoriengeschichte der Nationalökonomie. September 1993.

9314   BARTEL, Rainer: Wirtschaftspolitische Kontrolle und Beratung: Grundlagen, Probleme, Erfordernisse. September 1993, erschienen als: Kontrolle und Beratung in der Wirtschaftspolitik, in: *Wirtschaftspolitische Blätter*, 41. 1994,4, S. 442-462

9315   BARTH, Erling and ZWEIMÜLLER, Josef: Relative wages under decentralized and under corporatist bargaining systems, in: *Scandinavian Journal of Economics,* 97. 1995,3, S. 369-384

9316   FALKINGER, Josef and ZWEIMÜLLER, Josef: The impact of income inequality on product diversity and economic growth. Oktober 1993.

9317   SCHNEIDER, Friedrich: Anreizorientierte Systeme im Gesundheitswesen unter besonderer Berücksichtigung des stationären Sektors. Oktober 1993.

9318   HORSTMANN, Winfried and SCHNEIDER, Friedrich: Deficits, bailout and free riders: Fiscal elements of European constitution. Oktober 1993.

9319   BARTEL, Rainer: Egoismus, Altruismus, Ineffizienz und Kontrolle im öffentlichen Bereich: Ein kurzer Blick auf die Argumente und ihre Implikationen. November 1993, in: *Wirtschaft und Gesellschaft*, 20. 1994,2, S. 231-246

9320   BURGER, Christina: Theorien der Koalitionsbildung und ihre Anwendbarkeit auf österreichische Regierungen. November 1993.

9321   BARTEL, Rainer: Konjunkturelle Selbststabilisierung oder kompensatorische Nachfragepolitik? Ein Leitfaden für Studenten. Dezember 1993, tw. erschienen unter: Konjunkturprobleme - Selbstheilung oder Staatseingriffe?, in: *WISO*, 17. 1994,4, S. 111-39, erscheint tw. unter: Lohnindexierung - Effiziente Institution zur Stabilisierung der Wirtschaft?, in: *WiSt,* 26. 1997,3, S. 154-156

***

9401   WINTER-EBMER, Rudolf, ZWEIMÜLLER, Josef: Immigration and the Earnings of Young Native Workers. Jänner 1994, in: *Oxford Economic Papers*, 48. 1996, S. 473-491

9402   KUNST, Robert, HAUSER, Michael: Fractionally Integrated Models With ARCH Errors. Jänner 1994.

9403   ZWEIMÜLLER, Josef, WINTER-EBMER, Rudolf: Internal Markets and Firm-Specific Determination of Earnings in the Presence of Immigrant Labor, in: *Economics Letters*, 48. 1995, S. 185-191

9404   SCHUSTER, Helmut: Energie und Umwelt. März 1994.

9405   PFAFFERMAYR, Michael: Testing for Ownership Advantages of Direct Investing Firms. März 1994.

9406   SCHNEIDER, Friedrich: Determinanten der Steuerhinterziehung und der Schwarzarbeit im internationalen Vergleich. März 1994.

9407   FALKINGER, Josef: Social Stability and the Equity-Efficiency Trade-off. April 1994.

9408   WINTER-EBMER, Rudolf, ZWEIMÜLLER, Josef: Do Immigrants Displace Native Workers? Mai 1994, erscheint in: *Journal of Population Economics*, 1998.

9409   FALKINGER, Josef: How to overcome free-riding: Rewarding deviations from average. Mai 1994. Revidierte Fassung: Efficient Private Provision of Public Goods by Rewarding Deviations from Average, in: *Journal of Public Economics*, 62. 1996,3, S. 413-422

9410   ZWEIMÜLLER, Josef: Wealth distribution, innovations, and economic growth. Mai 1994.

9411   GANTNER, Manfried, SCHNEIDER, Friedrich: Budgetausgliederungen - eine polit-ökonomische Analyse. Juni 1994.

9412   AIGINGER, Karl: The use of game theoretical models for empirical research - A survey of testing non-cooperative game theory with real world data in recent industrial organization literature. Juni 1994.

9413   FALKINGER, Josef: The private provision of public goods when the relative size of contribution matters. Juli 1994, in: *Finanzarchiv*, 51, 1994, S. 358 - 371.

9414   WINTER-EBMER, Rudolf: Sex discrimination and competition in product and labour markets**,** in: *Applied Economics***,** 27. 1995,9, S. 849-857

9415   FALKINGER, Josef, ZWEIMÜLLER, Josef: The cross-country Engel curve for product diversification, August 1994, in: *Structural Change and Economic Dynamics,* 7. 1996,1, S. 79-97

9416   FALKINGER, Josef: Tax evasion, consumption of public goods and fairness, August 1994, in: *Journal of Economics Psychology*, 16, 1995, S. 63 - 72.

9417   SCHNEIDER, Friedrich: Einige Gedanken zur Harmonisierung indirekter Steuern in der Europäischen Union, September 1994.

9418   WINTER-EBMER, Rudolf: Firm size, earnings and displacement risk, Oktober 1994, erscheint in: *Economic Inquiry*, 2000.

9419   WEISS, Christoph: Labour market adjustment in U.S. manufacturing: Does market structure matter? Oktober 1994.

9420   WEISS, Christoph: State dependence, symmetry and reversibility of off-farm employment, November 1994.

9421   SCHNEIDER, Friedrich: Is there a European public choice perspective?, Dezember 1994.

***

9501   BARTEL, Rainer: Reform des öffentlichen Sektors - Grundlagen und Grundsätze, Jänner 1995.

9502   RIESE, Martin: The GINI-index as a measure of the goodness of prediction, Jänner 1995, in: *Bulletin of Economic Research,* 49. 1997,2, S. 127-135.

9503   AIGINGER, Karl, WINTER-EBMER, Rudolf und ZWEI-MÜLLER, Josef: Eastern European Trade and the Austrian Labour Market, in: *Weltwirtschaftliches Archiv,* 132. 1996,3, S. 476-500

9504   WEISS, Christoph: Size, Growth, and Survival of Upper Austrian Farms in the 1980s, Februar 1995. in: Sotte, F. and Zanoli, R.: "The Regional Dimension of Agricultural Economics and Politics", forthcoming (1995).

9505   BARTEL, Rainer: Umweltpolitik in den Reformländern Europas. Voraussetzungen und Erfordernisse, Februar 1995.

9506   PFAFFERMAYR, Michael: Foreign Outward Direct Investment and Exports in Austrian Manufacturing: Substitutes or Complements?, March 1995.

9507   BURGER, Christina, SCHNEIDER, Friedrich: How Valuable is the Health of the Elderly- Evaluation of the Treatment of Alzheimer's Disease; April 1995.

9508   BRUNNER, Johann, RIESE, Martin: Measuring the Severity of Unemployment, April 1995.

9509   SCHNEIDER, Friedrich: Volkswirtschaftliche Aspekte der Mitarbeiterbeteiligung, Mai 1995.

9510   ÖTSCH, Walter: Erwartungen und Framing. Keynes und die "Anomalien" der Erwartungsnutzentheorie, Mai 1995.

9511   ÖTSCH, Walter: Die Herausforderung des Konstruktivismus für die ökonomische Theorie, Mai 1995, in: Birger P. Priddat und Gerhard Wegner, Hrsg., Zwischen Evolution und Institution, Metropolis-Verl., Marburg, 1996, S. 35 - 55

9512   ÖTSCH, Walter: Kreativität und Logik im ökonomischen Handlungsmodell, Mai 1995.

9513   WEISS, Christoph: Determinants of Farm Survival and Growth, Mai 1995.

9514   BARTEL, Rainer: Zum Verhältnis von Ökonomie und Politik des öffentlichen Sektors. Einige kurze Anmerkungen, Juni 1995.

9515   KUNST, Robert M.: The Myth of Misspecification. Some Metaphors, Juni 1995.

9516   VAN DER BURG, Brigitte, SIEGERS, Jacques, WINTER-EBMER, Rudolf: Gender and Promotion in the Academic Labour Market. Juli 1995.

9517   FALKINGER, Josef, FEHR, Ernst, GÄCHTER, Simon, WINTER-EBMER, Rudolf: A simple mechanism for the efficient private provision of public goods - experimental evidence, August 1995, erscheint in: *American Economic Review*, 1999.

9518   SCHNEIDER, Friedrich: Some Elements of a European Federal Union: A Public Choice Approach, September 1995.

9519   BRUNNER, Johann, FALKINGER, Josef: Nonneutrality of taxes and subsidies for the private provision of public goods, September 1995.

9520   WEISS, Christoph: Product Market Power and Dynamic Labour Demand, September 1995.

9521   LANDESMANN, Michael, PFAFFERMAYR, Michael: Technological Competition and Trade Performance, October, 1995.

***

9601   WEISS, Christoph: Exits From a Declining Sector: Econometric Evidence From a Panel of Upper-Austrian Farms 1980-90., Jänner 1996.

9602   BÖS, Dieter und SCHNEIDER, Friedrich: Private-public partnership: Gemeinschaftsunternehmen zwischen Privaten und der öffentlichen Hand, Februar 1996.

9603   GÄCHTER, Simon, FEHR, Ernst, KMENT, Christiane: Does Social Exchange Increase Voluntary Cooperation?, Februar 1996.

9604   ZWEIMÜLLER, Josef, BRUNNER, Johann: Heterogeneous consumers, vertical product differentiation and the rate of innovation, März 1996.

9605   SCHNEIDER, Friedrich: The Contributions of Werner W. Pommerehne to Public Choice, März 1996.

9606   SEDJAV, Tsagaan-Uvgun: Wissenschaftlich-technologische Entwicklungsfragen der Mongolei, April 1996, Wissenschaftlicher Betreuer: o.Univ.-Prof. Dr. Helmut Schuster, B.Com.

9607   KEUSCHNIGG, Christian u. KOHLER Wilhelm: Innovation, Capital Accumulation and Economic Transition, revised version April 1996.

9608   AIGINGER, Karl: Beyond Trade Balances: the competitive race between the US, Japan and Europe, Juni 1996.

9609   POMMEREHNE, Werner W., HART, Albert und SCHNEIDER, Friedrich: Tragic Choices and Collective Decision-Making: An Empirical Study of Voter Preferences for Alternative Collective Decision-Making Mechanisms, Juli 1996.

9610   BARTEL, Rainer, POINTNER, Johannes, SCHNEIDER, Friedrich: Österreich im internationalen Wirschaftssystem, Juli 1996, erschienen in: E.Nowotny und G. Winckler (Hg.), Grundzüge der Wirtschaftspolitik Österreichs, 2. Aufl., Manz-Verlag, Wien 1997, S. 49-98.

9611   SCHNEIDER, Friedrich, VOLKERT, Jürgen: Die Realisierung ökologisch-orientierter Wirtschaftspolitik - eine Unmöglichkeit? Überlegungen aus Sicht der Neuen Politischen Ökonomie, Juli 1996.

9612   AIGINGER, Karl, WEISS, Christoph R.: Does it Pay to be Flexible? Empirical Evidence on the Relation- ship between Labour Demand Flexibility and Profit Margins, Juli 1996.

9613   WEISS, Christoph R.: Beneficial Concentration in a Menu Cost Model: A Note, August 1996.

9614   GUSENLEITNER, Markus, WINTER-EBMER, Rudolf, ZWEIMÜLLER, Josef: The Distribution of Earnings in Austria, 1972-1991, *Allgemeines Statistisches Archiv*, 3/98.

9615   WINTER-EBMER, Rudolf:: Benefit Duration and Unemployment Entry: Quasi-Experimental Evidence for Austria, Oktober 1996.

9616   WINTER-EBMER, Rudolf:: Potential Unemployment Benefit Duration and Spell Length: Lessons from a Quasi-Experiment in Austria, in: *Oxford Bulletin of Economics and Statistics*, 60. 1998,1, S. 33-45

9617   SCHNEIDER, Friedrich, FREY, Bruno S.: Warum wird die Umweltökonomik kaum angewendet?, November 1996.

9618   SCHNEIDER, Friedrich: Aktuelle Ergebnisse über die Schattenwirtschaft (Pfusch) in Österreich, November 1996.

9619   KOHLER, Wilhelm: Die langfristige Entwicklung der Transformationsländer Osteuropas: Welche Rolle spielt die Integration der Märkte?, Dezember 1996.

9620   BRUNNER, Johann K., PRINZ, Christopher, WIRTH, Friedrich: Die Zukunft der gesetzlichen Pensionsversicherung, Dezember 1996.

9621   SCHNEIDER, Friedrich, GAWEL, Erik: Umsetzungsprobleme ökologisch orientierter Steuerpolitik: Eine polit-ökonomische Analyse, Dezember 1996.

***

9701   SCHNEIDER, Friedrich: Hält der EURO, was er verspricht? Ökonomische Überlegungen zur Stabilität und zur Einführung des EURO, Jänner 1997.

9702   SCHNEIDER, Friedrich: Welche Chancen hat Österreich als Wirtschaftsstandort im EU- und Globalisierungskontext derzeit und in Zukunft?, Jänner 1997.

9703   BRUNNER, Johann K.: Ökonomische Analyse des umlagefinanzierten Pensionsversicherungssystems, Jänner 1997.

9704   PFAFFERMAYR, Michael, WEISS, Christoph R.: On Market Power and Investment Behaviour, January 1997.

9705   LANDESMANN, Michael A., STEHRER, Robert: Industrial Specialisation, Catching-up and Labour Market Dynamics, January 1997.

9706   BARTEL, Rainer: Taking even introductory textbooks seriously. A note on the importance of a usual neglect, February 1997.

9707   KUNST, Robert M.: Decision bounds for data-admissible seasonal models, March 1997.

9708   WINTER-EBMER, Rudolf, ZWEIMÜLLER, Josef: Intra-firm Wage Dispersion and Firm Performance, *Kyklos*, 1999.

9709   PRITZL, F. J. Rupert und SCHNEIDER, Friedrich: Korruption, März 1997.

9710 SCHNEIDER, Friedrich: Empirical Results for the Size of the Shadow Economy of Western European Countries Over Time, März 1997.

9711 SCHNEIDER, Friedrich und VOLKERT, Jürgen: No Chance for Incentive-orientated Environmental Policies in Representative Democracies? A Public Choice Approach, März 1997.

9712 FALKINGER, Josef: Wachstum, Verteilung und Beschäftigung, März 1997.

9713 PRITZL, F. J. Rupert und SCHNEIDER, Friedrich: Zur Politischen Ökonomie autokratischer politischer Systeme - Ein theoretischer und empirischer Ansatz, April 1997.

9714 SCHUSTER, Helmut: Das Phänomen der strukturellen Arbeitslosigkeit und Maßnahmen zu seiner Bekämpfung„ Mai 1997.

9715 BARTEL, Rainer: Paradigmatik versus Pragmatik in der (Umwelt-)Ökonomie. Eine epistemologische Sicht, Mai 1997.

9716 BERGER, Helge und SCHNEIDER, Friedrich: Does the Bundesbank Yield in Conflicts? Frey and Schneider Revisited, Juni 1997.

9717 RIESE, Martin und BRUNNER, Johann K.: Interpreting risk with demographic statistics, Juni 1997.

9718 KUNST, Robert M.: Asymptotics for Unit-Root Processes with Underspecified Deterministic Structures, Juni 1997.

9719 GAWEL, Erik und SCHNEIDER, Friedrich: Implementation Problems of Eco-Taxation: A Political-Economy Analysis, Juli 1997

9720 PRITZL, Rupert und SCHNEIDER, Friedrich: Political Economy of Autocratic Political Regimes: A Theoretical and Empirical Approach, Juli 1997

9721 WINTER-EBMER, Rudolf: Unknown Wage Offer Distribution and Job Search Duration, *Economics Letters*, 1998.

9722 BRUNNER, Johann K.: Optimal Taxation of Income and Bequests, August 1997

9723 KEUSCHNIGG, Christian and KOHLER, Wilhelm: Eastern Enlargement of the EU: How Much is it Worth for Austria?, November 1997

9724 HOFER, Helmut, KEUSCHNIGG, Christian und Wilhelm KOHLER, A Dynamic Applied General Equilibrium Model for the Austrian Economy With Special Emphasis on the Eastern EU Enlargement, November 1997.

***

9801 WINTER-EBMER, Rudolf und Klaus F. ZIMMERMANN: East-West Trade and Migration: The Austro-German Case, Jänner 1998, erscheint in: Jaime de Melo, Riccardo Faini und Klaus F. Zimmermann (eds.): Trade and Factor Mobility, Cambridge (CUP).

9802 ICHINO, Andrea und Rudolf WINTER-EBMER: The Long-Run Educational Cost of World War 2: An Application of Local Average Treatment Effect Estimation, Jänner 1998.

9803 SCHNEIDER, Friedrich: Deregulierung und Privatisierung als Allheilmittel gegen ineffiziente Produktion von öffentlichen Unternehmen? Ein Erklärungsversuch mit Hilfe der ökonomischen Theorie der Politik, Jänner 1998.

9804 SCHNEIDER, Friedrich: Märkte, Moral und Umwelt: Was sagt die Ökonomie dazu?, Jänner 1998.

9805 LENK, Thomas, FUGE, Heidi und SCHNEIDER, Friedrich: Zurück zu mehr Föderalismus: Ein Vorschlag zur Neugestaltung des Finanzausgleichs in der BRD unter besonderer Berücksichtigung der ökonomischen Theorie der Politik, Jänner 1998.

9806 SCHNEIDER, Friedrich: Stellt das starke Anwachsen der Schwarzarbeit eine wirtschaftspolitische Herausforderung dar? Einige Gedanken aus volkswirtschaftlicher Sicht, Jänner 1998.

9807 SCHNEIDER, Friedrich: Einige grundlegende Elemente einer europäisch-föderalen Verfassung unter Zuhilfenahme der konstitutionellen ökonomischen Theorie, Jänner 1998.

9808 LANDESMANN, Michael: Vertical produkt differentiation and international trade: an econometric analysis, März 1998.

9808a BARTEL, Rainer: Öffentliche Finanzen, Finanzkontrolle und gesellschaftliche Wohlfahrt. Volkswirtschaftliche Thesen, Antithesen und mögliche Synthesen, März 1998. Erschienen in

überarbeiteter Version in: F. Klug (Hrsg.), Wesen und staatspolitische Funktion der öffentlichen Finanzkontrolle, Schriftenreihe des Instituts für Kommunalwissenschaften an der Universität Linz, Bd. 107, S. 85-127.

9809 AIGINGER, Karl und PFAFFERMAYR, Michael: Product quality, cost asymmetry and the welfare loss of oligopoly, Februar 1998.

9810 KOHLER, Wilhelm: Die Ost-Erweiterung der EU: Eine österreichische Perspektive, April 1998.

9811 BERGER, Mathias und SCHNEIDER, Friedrich: Schattenwirtschaft und Steuerhinterziehung: Ökonomische und psychologische Aspekte, April 1998.

9812 SCHNEIDER, Friedrich und STIEGLER, Harald: Controlling als effizienzsteigerndes Instrument der Universitätsführung – Zauber- oder Leerformel?, April 1998.

9813 KUNST, Robert M.: Some aspects of modeling seasonality in economic time series, Juni 1998.

9814 KOHLER, Wilhelm: Fifty Years Later: A New Marshall Plan for Eastern Europe?, Juli 1998.

9815 RAPHAEL, Steven und WINTER-EBMER, Rudolf: Identifying the Effect of Unemployment on Crime, September 1998.

9816 ICHINO, Andrea und WINTER-EBMER, Rudolf: Lower and Upper Bounds of Returns to Schooling: An Exercise in IV Estimation with Different Instruments, September 1998, erscheint in: *European Economic Review*, 1999.

9817 PÖLL, Günther und SCHNEIDER, Friedrich: Schattenwirtschaft, Juli 1998.

9818 BRUNNER, Johann K.: Kapitaldeckungsverfahren versus Umlageverfahren: Grundsätzliches zur Systemdiskussion, August 1998.

9819 SCHNEIDER, Friedrich und ENSTE, Dominik: Increasing Shadow Economies all over the world - Fiction or Reality? A Survey of the Global Evidence of its Size and of its Impact from 1970 to 1995, November 1998.

9820 LENK, Thomas und SCHNEIDER, Friedrich: Zurück zu mehr Föderalismus: Ein Vorschlag zur Neugestaltung des Finanzausgleichs in der Bundesrepublik Deutschland unter besonderer Berücksichtigung der neuen Bundesländer, November 1998.

9821 KOHLER, Wilhelm: Die Bedeutung der EU-Osterweiterung für verschiedene Sektoren der österreichichen Wirtschaft, November 1998.

9822 KOHLER, Wilhelm: Die pan-europäische Integration: Herausforderungen für die Wirtschaftswissenschaft, November 1998.

9823 ATKINSON, Anthony B.: The Changing Distribution of Income: Evidence and Explanations (1. K.W. Rothschild Vorlesung), November 1998.

9824 PECH, Susanne und PFAFFERMAYR, Michael: Strategic Environmental Taxation in the Presence of Involuntary Unemployment and Endogenous Location Choice, November 1998.

9825 BARTEL, Rainer: Reform und Öffnung Osteuropas, November 1998.

9826 ÖTSCH, Walter: Zur Geschichte und Zukunft von Grundkategorien des ökonomischen Denkens: Raum, Zeit, Objekt und Ich, November 1998.

9827 ÖTSCH, Walter: „Äußere" und „Innere" Glücksmodelle in der Theoriegeschichte der Ökonomie, November 1998, erscheint in: Zinn, Bellebaum und Schaaf: Ökonomie und Glück, Frühjahr 1999.

9828 ÖTSCH, Walter: Konstruktivismus und ökonomische Theorie, November 1999, erscheint in: Lehmann und Pillath: Handbuch der Evolutorischen Ökonomik, Springer Verlag, 1999.

***

9901 WINTER-EBMER, Rudolf and ZWEIMÜLLER, Josef: Firm Size Wage Differentials in Switzerland: Evidence from Job Changers, Jänner 1999, erscheint in: *American Economic Review, Papers & Proceedings*, 1999.

9902 BRANDSTÄTTER, Eduard, KÜHBERGER, Anton und SCHNEIDER, Friedrich: "Surprise in Decision making under Uncertainty, Jänner 1999.

9903 SCHNEIDER, Friedrich und WAGNER, Alexander: "The Role of International Monetary Institutions after the EMU and after the Asian Crises: Some Preliminary Ideas Using Constitutional Economics", Februar 1999

9904 BRUNNER, Johann K.: Transfers zwischen den Generationen, Februar 1999.

9905 LACKÓ, Mária: Hidden Economy – An Unknown Quantity? Comparative Analysis of Hidden Economies in Transition Countries in 1989-1995, Februar 1999

9906 KOHLER, Wilhelm: Trade and Wages: What Can Factor Contents Tell Us? Februar 1999.

9907 LANDESMANN, Michael und STEHRER Robert: The European Unemployment Problem: A Structural Approach, März 1999.

9908 SCHNEIDER, Friedrich: Das Verhältnis von Innovation und Beschäftigung aus wirtschaftlicher Sicht – Jobkiller oder Jobwunder?, Mai 1999.

9909 SCHNEIDER, Friedrich und LENK, Thomas: Zurück zum Trennsystem als Königsweg zu mehr Föderalismus in Zeiten des „Aufbau Ost", Juni 1999.

9910 SCHNEIDER, Friedrich: Die Entwicklung der Sozialpolitik in repräsentativen und in direkten Demokratien: Königsweg oder Sackgasse? Einige Bemerkungen aus der „Public Choice"-Perspektive, Juni 1999.

9911 SCHNEIDER, Friedrich: Ist Schwarzarbeit ein Volkssport geworden? Ein internationaler Vergleich des Ausmaßes der Schwarzarbeit von 1970 bis 1997, Juni 1999.

9912 FELBERMAYR, Gabriel, und KOHLER, Wilhelm: Zur ökonomischen Logik spekulativer Attacken, Juli 1999.

9913 FERSTERER, Josef und WINTER-EBMER, Rudolf: Returns to Education - Evidence for Austria, August 1999.

9914 BARTEL, Rainer: Social economic issues in sexual orientation – Where do we stand?, September 1999.

9915 SCHNEIDER, Friedrich und ENSTE, Dominik: Shadow Economies: Sizes, Causes, and Consequences, September 1999.

9916 BARTEL, Rainer: Ökonomische Rationalität im System der öffentlichen Finanzkontrolle. Die Funktionalität des neuen Oö. Landesrechnungshofs. September 1999.

9917 FERSTERER, Josef und Rudolf WINTER-EBMER: Are Austrian Returns to Education Falling Over Time?, Oktober 1999.

9918 SCHNEIDER, Friedrich und WINNER, Hannes: Ein Vorschlag zur Reform der österreichischen Unternehmensbesteuerung, November 1999.

9919 SCHNEIDER, Friedrich: Induzieren ökologische Steuerreformen einen Lenkungseffekt oder nur volle Staatskassen? Einige volkswirtschaftliche Überlegungen, November 1999.

9920 KOHLER, Wilhelm: Wer gewinnt, wer verliert durch die Osterweiterung der EU?, November 1999.

9921 DRÈZE, Jacques: On the Macroeconomics of Uncertainty and Incomplete Markets, November 1999.

9922 STIGLBAUER, Alfred M. und WEISS, Christoph R.: Family and Non-Family Succession in the Upper-Austrian Farm Sector, Dezember 1999.

9923 HOLZLEITNER, Christian: Linear Profit-Sharing in Regulatory Contracts, Dezember 1999.

9924 ÖTSCH, Walter: Objekt, Subjekt und Wert. Zur Kulturgeschichte in Georg Simmels "Philosophie des Geldes", Dezember 1999.

***

0001 KOHLER, Wilhelm: Die Osterweiterung der EU aus der Sicht bestehender Mitgliedsländer: Was lehrt uns die Theorie der ökonomischen Integration?, Jänner 2000.

0002 FERSTERER, Josef und WINTER-EBMER, Rudolf: Smoking, Discount Rates, and Returns to Education, Jänner 2000.

0003 BARTEL, Rainer: Quo vadimus. Grundgedanken zum Verhältnis von Wirtschaft, Staat und Gesellschaft, Februar 2000.

0004 SCHNEIDER, Friedrich und FREY, Bruno S.: Informal and Underground Economy, Februar 2000.

0005 SCHNEIDER, Friedrich und FELD, Lars P.: State and Local Taxation, Februar 2000.

0006 ZWEIMÜLLER, Josef und WINTER-EBMER, Rudolf: Firm-specific Training - Consequences for Job Mobility, März 2000.

0007 SCHNEIDER, Friedrich: Schattenwirtschaft – Tatbestand, Ursachen, Auswirkungen, April 2000

0008 SCHNEIDER, Friedrich: The Increase of the Size of the Shadow Economy of 18 OECD Countries: Some Preliminary Explanations, April 2000.

0009 SCHNEIDER, Friedrich und AHLHEIM, Michael: Allowing for Household Preferences in Emission Trading – A Contribution to the Climate Policy Debate, Mai 2000

0010 SCHNEIDER, Friedrich: Illegal Activities, but still value added ones (?): Size, Causes, and Measurement of the Shadow Economies all over the World, Mai 2000.

0011 WEICHSELBAUMER, Doris: Is it Sex or Personality? The Impact of Sex-Stereotypes on Discrimination in Applicant Selection, Mai 2000.

0012 FELBERMAYR, Gabriel, und KOHLER, Wilhelm: Effizienz- und Verteilungswirkungen der Handelsliberalisierung, Juni 2000.

0013 EGGER, Peter und PFAFFERMAYR, Michael: Trade, Multinational Sales, and FDI in a Three-Factors Model, Juni 2000.

0014 LANDESMANN, Michael und STEHRER, Robert: Potential Switchovers in Comparative Advantage: Patterns of Industrial Convergence, Juni 2000.

0015 SCHNEIDER, Friedrich und WAGNER, Alexander: Korporatismus im europäischen Vergleich: Förderung makroökonomischer Rahmenbedingungen?, Juli 2000.

0016 SCHNEIDER, Friedrich und LENK, Thomas: Grundzüge der föderalen Finanzverfassung aus ökonomischer Perspektive: Trennsystem vs. Verbundsystem, Juli 2000.

0017 HOLZLEITNER, Christian: Efficient Cost Passthrough, August 2000.

0018 HOLZLEITNER, Christian: Evolution of Regulatory Contracts in the Real World - A Change for Good?, August 2000.

0019 KOHLER, Wilhelm: International Fragmentation: A Policy Perspective, August 2000.

0020 KOHLER, Wilhelm: A Specific-Factors View on Outsourcing, August 2000.

0021 WEICHSELBAUMER, Doris: Sexual Orientation Discrimination in Hiring, September 2000.

0022 KOHLER; Wilhelm: Internationale Migration: Anmerkungen aus der Sicht der Außenwirtschaftstheorie, Oktober 2000.

0023 AIGINGER, Karl und DAVIES, S.W.: Industrial Specialisation and geographic Concentration: Two sides of the same coin? Not for the European Union, Oktober 2000.

0024 EGGER, Hartmut und EGGER, Peter: Outsourcing and Skill-Specific Employment in a Small Economy: Austria and the Fall of the Iron Curtain, Oktober 2000.

0025 KOHLER, Wilhelm: An Incumbent Country View on Eastern Enlargement of the EU - Part I: A Gerneral Treatment, November 2000.

0026 KOHLER, Wilhelm: An Incumbent Country View on Eastern Enlargement of the EU - Part II: The Austrian Case, November 2000.

0027 FREY, Bruno S.: What are the sources of happiness?, November 2000

0028 RIESE, Martin: Weakening the SALANT-condition for the Comparison of mean durations, Dezember 2000

0029 WINTER-EBMER, Rudolf: Long-term consequences of an innovative redundancy-retraining project: The Austrian Steel Foundation, Dezember 2000.

0030 BRUNNER, Johann K. und PECH, Susanne: Adverse Selection in the annuity market when payoffs vary over the time of retirement, Dezember 2000.

***

0101 KOHLER, Wilhelm: Osterweiterung der EU: Die Mitgliedschaft wird teurer – Wird sie auch wertvoller?, Jänner 2001.

0102 STEHRER, Robert: Industrial specialisation, trade, and labour market dynamics in a multisectoral model of technological progress, Jänner 2001.

0103 SCHNEIDER, Friedrich; SALHOFER, Klaus; SCHMID, Erwin, und STREICHER, Gerhard: Was the Austrian Agricultural Policy Least Cost Efficient?, März 2001.

0104 SCHNEIDER, Friedrich; KIRCHLER, Erich und MACIEJOVSKY, Boris: Social Representations on Tax Avoidance, Tax Evasion, and Tax Flight: Do Legal Differences Matter?, März 2001.

0105 SCHNEIDER, Friedrich; PITLIK, Hans, und STROTMANN, Harald: On the Politicization of Intergovernmental Fiscal Relations in Germany after Unification, März 2001.

0106 SCHNEIDER, Friedrich: Privatisierung und Deregulierung in Österreich in den 90er Jahren: Einige Anmerkungen aus Sicht der Neuen Politischen Ökonomie, März 2001.

0107 SCHNEIDER, Friedrich; BRAITHWAITE, Valerie, and REINHART, Monika: Individual Behavior in the Cash / Shadow Economy in Australia: Facts, Empirical Findings and some Mysteries, März 2001.

0108 BRUNELLO, Giorgio; LUCIFORA, Claudio, und WINTER-EBMER, Rudolf: The Wage Expectations of European College Students, März 2001.

0109 BRUNNER, Johann K. und PECH, Susanne: Die Dritte Säule der Altersvorsorge - Sparen und Versichern?, Juni 2001.

0110 STÖGER, Klaus und WINTER-EBMER, Rudolf: Lehrlings-ausbildung in Österreich: Welche Betriebe bilden Lehrlinge aus? Juli 2001.

0111 HEIJDRA, Ben J.; KEUSCHNIGG, Christian, und KOHLER, Wilhelm: Eastern Enlargement of the EU: Jobs, Investment and Welfare in Present Member Countries, Oktober 2001

0112 BRUNNER, Johann und BUCHEGGER, Reiner: Gesundheitsgüter und Gesundheitsdienstleistungen in Österreich, Dezember 2001.

0113 MALINVAUD, Edmond: On methodolgy in macroeconomics – with application to the demand for unskilled labour, November 2001.

***

0201 KOHLER, Wilhelm: The Distributional Effects of International Fragmentation, April 2002.

0202 WINTER-EBMER, Rudolf and WIRZ, Aniela: Public Funding and Enrolment into Higher Education in Europe, April 2002.

0203 KOHLER, Wilhelm: Issues of US-EU Trade Policy, May 2002.

0204 BRUNNER, Johann K. und PECH, Susanne: Adverse selection in the annuity market with sequential and simultaneous insurance demand, May 2002.

0205 Stiglbauer, Alfred, Stahl, Florian, Winter-Ebmer, Rudolf and Josef Zweimüller: Job Creation and Job Destruction in a Regulated Labor Market: The Case of Austria, July 2002.

0206 BÖHEIM, René und TAYLOR, Mark P: Job search methods, intensity and success in Britain in the 1990s, July 2002.

0207 BURGSTALLER, Johann: Are stock returns a leading indicator for real macroeconomic developments?, July 2002.

0208 KOHLER, Wilhelm: Aspects of International Fragmentation, August 2002.

0209 PECH Susanne: Tax incentives for private life annuities and the social security reform: effects on consumption and on adverse selection, August 2002.

0210 BRUNELLO, Giorgio and WINTER-EBMER, Rudolf: Why Do Students Expect to Stay Longer in College? Evidence from Europe, August 2002.

0211 RIESE, Martin: A New Class of Ageing Distributions, December 2002.

0212 BRUNNER, Johann K.: Welfare Effects of Pension Finance Reform, December 2002.

***

0301 SCHNEIDER, Friedrich and BAJADA, Christopher: The Size and Development of the Shadow Economies in the Asia-Pacific, April 2003.

0302 SCHNEIDER, Friedrich, CHAUDHURI, Kausik and CHATTERJEE, Sumana: The Size and Development of the Indian Shadow Economy and a Comparison with other 18 Asian Countries: An Empirical Investigation, April 2003.

0303 SCHNEIDER, Friedrich, WAGNER, Alexander F. and DUFOUR, Mathias: Satisfaction not guaranteed - Institutions and sastisfaction with democracy in Western Europe, April 2003.

0304 SCHNEIDER, Friedrich and WAGNER; Alexander, F.: Tradeable permits - Ten key design issues, April 2003.

0305 KOHLER, Wilhelm: Factor Price Frontiers with International Fragmentation of Multistage Production, April 2003.

0306 BURGSTALLER, Johann: Interest Rate Transmission to Commercial Credit Rates in Austria, May 2003.

0307 WEICHSELBAUMER, Doris and WINTER-EBMER, Rudolf: The effects of competition and equal treatment laws on the gender wage differential, July 2003.

0308 MAYR, Karin: Immigration and Majority Voting on Income Redistribution - Is there a Case for Opposition from Natives?, July 2003.

0309 BRUNNER, Johann K.: Optimum taxation of income from labour and capital in a dynamic two-person economy, September 2003.

0310 BRUNNER, Johann K.: Optimale direkte und indirekte Steuern bei unterschiedlicher Anfangsausstattung, September 2003.

0311 WEICHSELBAUMER, Doris and WINTER-EBMER, Rudolf: A meta-analysis of the international gender wage gap, September 2003.

0312 WEICHSELBAUMER, Dors and WINTER-EBMER, Rudolf: Rhetoric in Economic Research: The Case of Gender Wage Differentials, September 2003.

0313 DULLECK, Uwe, FRIJTERS, Paul and WINTER-EBMER, Rudolf: Reducing Start-up costs for New Firms. The Double Dividend on the Labor Market, October 2003.

0314 Aiginger, Karl: Insufficient investment into future growth: the forgotten cause of low growth in Germany, November 2003

0315 FELBERMAYR, Gabriel J. and LICANDRO, Omar: The underestimated virtues of the two-sector AK model, December 2003.

0316 KOHLER, Wilhelm: Eastern Enlargement of the EU: A Comprehensive Welfare Assessment, December 2003.

0317 RODRIK, Dani: Growth Strategies, December 2003.

***

0401 FELBERMAYR, Gabriel and KOHLER, Wilhelm: Immigration and Native Welfare, February 2004.

0402 FELBERMAYR, Gabriel: Specialization on a Technologically Stagnant Sector Need Not Be Bad for Growth, March 2004.

0403 SCHNEIDER, Friedrich and KLINGLMAIR, Robert: Shadow Economies around the World: What do we know?, April 2004.

0404 BELKE, Ansgar and SCHNEIDER, Friedrich: Privatization in Austria: Some Theoretical Reasons and Performance Measures, June 2004.

0405 SCHNEIDER, Friedrich and BURGER, Christina: Formal and Informal Labour Markets: Challenges and Policy in the Central and Eastern European new EU Members and Candidate Countries, June 2004.

0406 SCHOR, Juliet: Sustainable Consumption and Worktime Reduction, June 2004.

0407 FELBERMAYR, Gabriel: Does Trade Cause Divergence? Dynamic Panel Data Evidence, Juni 2004.

0408 BUCHEGGER, Reiner and WÜGER Michael: Private Expenditures for Children in Austria - Variations in Results applying different Models, July 2004.

0409 MAYR, Karin: The Fiscal Impact of Immigrants in Austria – A Generational Accounting Analysis, July 2004.

0410 HALLA, Martin: Unterhalt, Obsorge und Scheidungsanwälte: Eine ökonometrische Untersuchung der einvernehmlichen Scheidung in Österreich., August 2004.

0411 RAFERZEDER, Thomas and WINTER-EBMER Rudolf: Who is on the Rise in Austria: Wage Mobility and Mobility Risk, September 2004.

0412 PECH, Susanne: Adverse Selection with individual- and joint-life annuities, November 2004.

0413 LICHTENECKER, Ruperta: Gender Budget Analyse: Akademische Übung oder politische Relevanz?, December 2004.

0414 PECH, Susanne: Portfolio decisions on life annuities and financial assets with longevity and income uncertainty, December 2004.

0415 HACKL, Franz, HALLA, Martin and PRUCKNER, Gerald, J.: The Fallacy of the Good Samaritan: Volunteering as a Weird Way of Making Money, December 2004.

***

0501 BUCHEGGER, Reiner and RIEDL, René: Asymmetric Information as a Cause for Market Failure - Application Service Providing (ASP) in Austria, January 2005.

0502 SCHNEEWEIS, Nicole and WINTER-EBMER, Rudolf: Peer Effects in Austrian Schools, March 2005.

0503 BURGSTALLER, Johann: When and why do Austrian companies issue shares?, April 2005.

0504 BÖHEIM, René, STIGLBAUER, Alfred and WINTER-EBMER, Rudolf: When and how to create a job:
The survival of new jobs in Austrian firms, May 2005.

0505 HALLA, Martin, SCHNEIDER, Friedrich: Taxes and Benefits: Two Distinct Options to Cheat on the State?, August 2005

0506 BRUNNER, Johann and PECH, Susanne: Optimum Taxation of Life Annuities, November 2005.

0507 SCHUSTER, Helmut: Reduktionismus, interaktionistischer Eigenschafts-Dualismus und Epiphänomenalismus, Dezember 2005.

0508 DULLECK, Uwe and KERSCHBAMER, Rudolf: Price Discrimination via the Choice of Distribution Channels, December 2005.

0509 DULLECK, Uwe and KERSCHBAMER, Rudolf: Experts vs. Discounters: Consumer Free Riding and Experts Withholding Advice in Markets for Credence Goods, December 2005.

0510 BURGSTALLER, Johann: Interest rate pass-through estimates from vector autoregressive models, December 2005.

0511 HACKL Franz, HALLA Martin and PRUCKNER, Gerald, J.: Coasian Payments for Agricultural External Benefits – An Empirical Cross Section Analysis, December 2005.

0512 BÖHEIM René and MAYR, Karin: Immigration and Public Spending, December 2005.

***

0601 LICHTENECKER, Ruperta: Umwelttechnikindustrie-Zukunftsmarkt China, Jänner 2006

0602 BURGSTALLER, Johann: The cyclicality of interest rate spreads in Austria: Evidence for a financial decelerator?, July 2006.

0603 DREHER, Axel and SCHNEIDER, Friedrich: Corruption and the Shadow Economy: An Empirical Analysis, July 2006.

0604 SAVASAN, Fatih and SCHNEIDER, Friedrich: What Determines Informal Hiring? Evidence from the Turkish Textile Sector, July 2006.

0605 SCHNEIDER, Friedrich, SOOKRAM Sandra and WATSON, Patrick Kent: Characteristics of the Household Sector of the Hidden Economy in an Emerging Economy, July 2006.

0606 BELKE, Ansgar, BAUMGÄRTNER, Frank, SETZER, Ralph and SCHNEIDER, Friedrich: The Different Extent of Privatisation Proceeds in EU Countries: A Preliminary Explanation Using a Public Choice Approach, July 2006.

0607 DELL'ANNO, Roberto and SCHNEIDER, Friedrich: Estimating the Underground Economy by Using MIMIC Models: A Response to T. Breusch´s critique, July 2006.

0608 SCHNEIDER, Friedrich and TORGLER, Benno: What Shapes Attitudes Toward Paying Taxes? Evidence from Multicultural European Countries, July 2006.

0609 DREHER Axel, MÉON, Pierre-Guillaume, SCHNEIDER, Friedrich and WEILL, Laurent: Does the shadow economy raise observed aggregate efficiency? A cross-country comparison, July 2006.

0610 PROHL, Silika and SCHNEIDER, Friedrich, Sustainability of Public Debt and Budget Deficit: Panel cointegration analysis for the European Union Member countries, July 2006.

0611 BURGSTALLER, Johann: Bank income and profits over the business and interest rate cycle, July 2006.

0612 BÖHEIM, René and WEBER, Karin: The effects of marginal employment on subsequent labour market outcomes, July 2006.

0613 DULLECK, Uwe, FRIJTERS, Paul and PODCZECK, Konrad: All-pay Auctions with Budget Constraints and Fair Insurance, July 2006.

0614 GLÄSER, Lars and HALLA, Martin Die EU-Zinsenrichtlinie: Ein Schuss in den Ofen?, August 2006.

0615 ÖTSCH, Walter: Gottes-Bilder und ökonomische Theorie: Naturtheologie und Moralität bei Adam Smith, August 2006.

0616 BURGSTALLER, Johann: Financial Predictors of Real Activity and the Propagation of Aggregate Shocks, September 2006.

0617 SCHNEIDER, Friedrich: Shadow Economies and Corruption all over the World: What do we really know?, September 2006.

0618 ATTENEDER, Christine and HALLA, Martin: Bargaining at Divorce: The Allocation of Custody, September 2006.

0619 MAYR, Karin: Optimal Budget Deficits and Immigration, October 2006.

0620 SCHNEEWEIS, Nicole: How should we organize schooling to further children with migration background?, December 2006

***

0701 SCHNEIDER; Friedrich and TORGLER, Benno: Shadow Economy, Tax Morale, Governance and Institutional Quality: A Panel Analysis, January 2007.

0702 SCHNEIDER; Friedrich and TORGLER, Benno: The Impact of Tax Morale and Institutional Quality on the Shadow Economy, January 2007.

0703 SCHNEIDER, Friedrich and HAMETNER, Bettina: The Shadow Economy in Colombia: Size and Effects on Economic Growth, January 2007.