

Indirect measurement methods for undeclared work in Germany

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1. Review and classification of macroeconomic approaches

1.1. Statistical Office (Statistisches Bundesamt)

The GDP calculations by the Federal Statistical Office in Germany include estimates for undeclared work according to the regulations for the European System of National Accounts from 1995 (*Statistisches Bundesamt, 2008*). Production incorporates illegal work or activities concealed to tax offices, social insurance, statistical offices or other authorities. Housework is not included.

This is done by two principal approaches:

- *Explicit surcharge* for the under-representation of activities like internal labour for housing construction, gratuities in restaurants and pubs, prostitution, private schooling lessons etc. These surcharge rates are regularly checked within the revisions of national accounts.
- *Implicit calculation* by estimation procedures. Agricultural production e.g. is calculated on the basis of the cultivated areas multiplied by the average crop rather than the statistical registration of agricultural production. Similar methods are used for the calculation of the sum of rents, using the square meters of living

space multiplied with average rents. Tax declaration or other statistical evidence is not relevant.

For this purpose a series of calibrations are undertaken. This includes the coordinated estimate of employment data, input-output-data, turnover statistics, and a series of special estimates of the explicit surcharge rates.

The Statistical Office, however, does not publish estimates for the size of the shadow economy or undeclared work. These figures are not needed for GDP calculations if the above mentioned methods are used. Moreover – as the Office argues – there is hardly any international definition of the shadow economy, and an official calculation of something illegal is seen as an antagonism in itself.

The calculations of undeclared work according to these procedures have been approved by the European Commission.

1.2. IAW/Schneider approach

The Institute for Applied Economic Research (IAW) published figures for the size of the shadow economy on a regular basis:

Name of method	Forecast of developments in the German shadow economy
Stakeholder	Institute for Applied Economic Research (IAW) University of Linz (F. Schneider)
Time period	1975 to 2009
Definition	The shadow economy includes <ul style="list-style-type: none"> • undeclared work • illegal work (illegal agency work, illegal employment of foreign workers) • criminal action
Estimation approach	Econometric estimate; Combination of monetary and DYMIMIC approach: Cash demand is estimated with a function assuming that shadow activities are financed with cash money only. The DYMIMIC approach assumes that shadow activities depend on measurable impacts, like tax burden, regulatory density, official working hours etc. The latent variable “shadow economy” can thus be estimated.
Nature of data	<ul style="list-style-type: none"> • Macro-economic estimate in billion euro • % share of GDP • International comparisons
Breakdown	<ul style="list-style-type: none"> • Broad economic sectors (construction, manufacturing, services, entertainment industry, personal services) • Factors determining the shadow economy (macro-economy, change of tax rates etc.) • No breakdown by type of workers
Literature	<ul style="list-style-type: none"> • Institut für Angewandte Wirtschaftsforschung (IAW) 2009: Wirtschaftskrise führt wieder zum Anstieg der Schatten-

	<p>wirtschaft.</p> <p>http://www.iaw.edu/iaw/De:Aktuelles:Pressemitteilungen</p> <ul style="list-style-type: none">• Friedrich Schneider (2004): Arbeit im Schatten: Eine Wachstumsmaschine für Deutschland? Gabler Verlag.• Friedrich Schneider, Dominik ENSTE (2002): The Shadow Economy: An International Survey. Cambridge University Press.
Comment	<p>The approach depends on residuals between the official economy and overall monetary flows. This creates a high degree of uncertainties. There is a tendency to overestimate the size of the shadow economy.</p> <p>Macro-economic methods can hardly identify the type of activity.</p>

1.3. The Rockwool approach

An approach used for the estimation of undeclared work in Denmark, Norway and Sweden was applied to Germany by the Rockwool Foundation (Feld, Larsen 2005). This study interviewed a representative sample of the population aged 18 to 74 in 2004 and used a similar survey in 2001 for comparisons.

Name of method	Rockwool approach
Stakeholder	Rockwool foundation
Time period	2001/2004
Definition	Black activities are defined as productive economic activities which are legal and taxable, but on which income tax, social security contributions, VAT, etc., are not paid, because they are not reported to tax or customs authorities. This is rather close to the definition of undeclared work. Prices and wages therefore can be kept below what should have been paid at the formal market. Buyer and seller are both aware of this, and both obtain an extra economic advantage. Mutual exchange of labour services among private households is included.
Estimation approach	Direct survey method. Representative population sample (14+). 6154 persons interviewed in 2001 2415 persons interviewed in 2004
Nature of data	Number of persons involved in undeclared work
Breakdown	<ul style="list-style-type: none"> • Data classified by a great variety of personal characteristics (age, gender, formal qualification, occupation, employment status, income etc.) • Working time spent on undeclared work • Earnings from undeclared work • Logistic regressions to explain participation in black activities.
Literature	<ul style="list-style-type: none"> • Feld L. P., Larsen C. (2005): Black Activities in Germany in 2001 and in 2004. A Comparison Based on Survey Data. News from the Rockwool Foundation Research Unit. Copenhagen, June 2005.
Comment	Asking persons directly about their involvement in the black economy reveals surprisingly great openness of interviewees to report about such activities. However, it can be assumed that only "peccadilloes" are reported. Serious violations of the law and activities of bigger volume can hardly be measured by this method. However, it provides a detailed insight into the "smaller" activities.

2. Up-to-date figures

2.1. IAW/Schneider approach

As a forecast the approach expects the shadow economy to expand from 14.2 % of GDP in 2008 to 14.6 % in 2009. The overall volume will be € 352 billion.

The increase is mainly explained by the greater willingness of unemployed and short-time workers to be involved in undeclared work in the course of the economic contraction. The forecast assumes a decline of GDP between 1 and 2 %. If the present forecasts for 2009 – ranging between -5 and -6 % - were used, the expansion would be even stronger.

This is partly compensated by tax preferences for private households and lower unemployment insurance premiums. Higher health insurance premiums however are expected to raise the volume of shadow activities.

Determinant	Implied % change of 2008 GDP
GDP decline	+ 2,9
Increase of underemployment	
Increase of health insurance premiums	+ 0,2
Decrease of unemployment insurance premiums	- 0,3
Tax exemption for modernisation expenditures for private households	- 1,4
Total shadow economy	+ 1,3

Regarding the sectoral composition of the shadow economy, the following figures are given:

Sector	% share of 2009 shadow economy
Construction and craft-related business	38
Other production	17
Services	17
Entertainment industries	13
Household services	15
Total	100

2.2. Rockwool approach

There are no updated figures for the 2005 publication. For 2004, the study showed that

- The number of persons involved in black activities was 8.8 % of the population. The participation rate for men (14.5 %) was more than twice the rate for women (6.5 %). Young persons were also overrepresented, in particular the age group of the 20-29 year olds. High rates were also found for the age groups from 18-19 year and 70-74. The group between 30 and 50 years however, showed lower "shadow-economy" participation.
- Black activities are widespread among unemployed, skilled workers, and people undergoing education and training.
- On average, 7 ½ hours were spent per week on black activities per person engaged in such activities. Men spent more (almost 8 hours) than women (6 ¾ hours).
- The average remuneration per hour amounted to 10.40 euro in 2004, more or less the same as in 2001. For men the hourly rate was 11.00 euro and 8.70 for women. 12 euro was paid to skilled workers, and 9.20 euro to unskilled.

The propensity to be engaged in undeclared work strongly depended on personal characteristics. The typical black worker was young, unmarried without children, low-skilled, low or medium income earner, and lived in eastern Germany.

Using these information bits, the Rockwool Foundation estimated the total size of the black economy in Germany to 3.1 % of the 2004 GDP. This was a 24 % decline since 2001. In full-time equivalents, 1.3 million jobs could be found in the informal economy. Similar to the macro-estimates the construction sector was the biggest part of the black economy, followed by agriculture and the hotel and catering sector. Transport and communication also was among the "big" sectors.

3. Assessment of approaches

The issue of undeclared work does not play a central role in Germany, even if public authorities are aware of the problem and combat undeclared work in many areas. Official estimates, however, do not exist and the few research approaches strongly differ regarding the size and structure of undeclared work.

Macro-estimates of the shadow economy – as undertaken by Schneider – strongly depend on the type of econometric approach and its parameters. Due to the lack of any hard facts or figures, its results remain highly uncertain. Even worse, the money demand approach tends to overestimate undeclared work. The velocity of money can only be measured with indirect methods and requires strong assumptions.

In practical terms, a share of 14.6 % in German GDP is hardly reflected by other evidence. This would mean that every 7th person is a full-time worker in the shadow economy. Considering the strong control by customs authorities (which are responsible for combating undeclared work) and the Chambers, this appears to be an unrealistic size.

Estimates based on survey methods on the other side tend to underestimate the size of undeclared work. They are restricted to the area of publicly tolerated black activities but can hardly reveal the "big" cases of criminal action. Moreover, there is indication that cases in which social transfer or tax fraud might be involved, respondents

did not provide correct information. The logit-estimates of the propensity to be engaged in undeclared work do not show a significant impact of the variable "unemployed". This however is one of the major sources of undeclared work as the register of criminal information reveals.

The overall GDP share resulting from survey-based estimates therefore appears to be too small. This means that at present we can only say that undeclared work is less than 14.6 % as estimated by the IAW/Schneider approach and more than 3.1 % as estimated by the Rockwool approach.

For labour-related issues, the survey-based method has some advantages, as it provides differentiated information on the population involved in undeclared work, the working hours and incomes dedicated to these activities and other issues. Moreover, multi-dimensional estimates of undeclared work can be undertaken with such data-sets.

Literature

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Annex 1 – template for review of indirect measurement methods

Method	Estimation approach used	Underlying data and information requirements	Type of data on UDW delivered	Time period covered and frequency of data collection	Breakdown available	Key strengths	Key weaknesses	Potential applicability across the Member States	Key existing sources in your country	Any other comments
IAW/Schneider	Econometric estimate; Combination of monetary and DYMIMIC approach	Working hours Material consumption VAT drop-out Cash flow	Volume of UDW in billion euro % share of GDP international comparisons	1975-2009	Broad economic sectors (construction, manufacturing, services, entertainment industry, personal services) Factors determining the shadow economy (macro-economy, change of tax rates etc.) No breakdown by type of workers	A broad definition of UDW, including illegal work and criminal action; Macro-estimates for all parts of Germany; Comparisons over long time periods; Behavioral explanation of UDW activities, related to government regulation and tax burdens;	The approach depends on residuals between the official economy and overall monetary flows. This creates a high degree of uncertainties. There is a tendency to overestimate the size of the shadow economy. Macro-economic methods can hardly identify the type of activity.	Good; the approach is applied for international comparisons	* see below	

*** Key sources:**

- Institut für Angewandte Wirtschaftsforschung (IAW) 2009: Wirtschaftskrise führt wieder zum Anstieg der Schattenwirtschaft. <http://www.iaw.edu/iaw/De:Aktuelles:Pressemitteilungen>
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- Friedrich Schneider, Dominik ENSTE (2002): The Shadow Economy: An International Survey. Cambridge University Press.

Method	Estimation approach used	Underlying data and information requirements	Type of data on UDW delivered	Time period covered and frequency of data collection	Breakdown available	Key strengths	Key weaknesses	Potential applicability across the Member States	Key existing sources in your country	Any other comments
Rockwool	Survey-based estimate	Population survey with key questions to UDW activities of the population	Number of workers involved in UDW; Number of working hours; Average UDW income Volume of UDW (black activities) for Germany; % share of GDP	2001, 2004	Data classified by a great variety of personal characteristics (age, gender, formal qualification, occupation, employment status, income etc.) Working time spent on undeclared work Earnings from undeclared work Logistic regressions to explain participation in black activities.	Detailed information on UDW activities with various cross-section information; Micro-based estimates for explanatory approaches;	Only "socially accepted" part of UDW reported (no criminal activity etc.); Limited observations over time;	Easy to use methodology which can be applied to every country	* see below	

* Key sources:

Feld L. P., Larsen C. (2005): Black Activities in Germany in 2001 and in 2004. A Comparison Based on Survey Data. News from the Rockwool Foundation Research Unit. Copenhagen, June 2005.