ESTIMATES OF THE HIDDEN ECONOMY IN AUSTRIA ON THE BASIS OF OFFICIAL STATISTICS

BY ALFRED FRANZ

Austrian Central Statistical Office

By definition, the hidden economy eludes straight observation by means of official statistics. Nevertheless, attempts to quantify these phenomena usually make reference to official materials in various respects, e.g. as regards definition, or when evaluating the relative importance or some indirect reflections of such activities. In this context, official statistics may serve as a particularly useful reference when those sections of the economy are concerned which are hardly or not at all susceptible to hidden activities. Such sections can be identified in terms of industry and in terms of occupation.

In the present investigation such techniques have been used to a large extent and only official statistics have been drawn upon as a data source. Accordingly, the outcome matches closely with national accounts concepts and existing national classifications of various socio-economic statistics. The estimates refer to the hidden ("off the records") activities of the self-employed as well as to similar activities of employees, the unemployed etc. ("moonlighting"). *Per se* criminal activities have not been included, however. As regards the self-employed the estimates basically rely on income differentials observed between small scale entrepreneurs and their employees. As regards employees numbers employed of various preselected occupational categories and of some additional groups of non-employed have been processed successively, matching them e.g. with comparable data on time budgets and regional frequency.

The outcome largely confirms common experience or expectations as regards the fields where hidden activities assume significant relative importance whereas the overall size of the hidden economy turned out fairly small as compared with official GDP.

INTRODUCTION

The Hidden Economy is usually not adequately represented in official economic and social statistics. Thinking of concepts of some regular statistics on the Hidden Economy, it is the reporting behaviour of the respondents (or, better to say non-respondents) rather than the nature of the activity which must govern the design of such data production: If respondents have a vital interest in hiding something it is more than questionable whether official statistics can ever achieve the aim of directly observing those activities, and it is even questionable whether non-official attempts to collect such primary information can succeed. As a solution, the identification of *indirect* reflections of hidden activities in official statistics, in *combination* with the application of some constraining criteria on the possibility of the occurrence of such activities, may well lead to meaningful quantitative indications, in particular when applied to detailed statistical data [1]. Quite naturally, any such figures in this field are always subject to overall plausibility considerations, and in particular, economic reasoning.

Although no research has been done so far on this topic in Austria in recent years many figures and other guesses have been publicized, most of them terribly exaggerated due to neglect of any of the afore-mentioned criteria. Mainly to straighten out those rash notions of the public and, possibly, to contribute to future attempts to find a solid methodological basis in "semi-official" statistics on the Austrian Hidden Economy the study presented in summary form here has been undertaken [2].

METHODOLOGY IN GENERAL: PREMISES AND CONVENTIONS

Subject of the Investigation

The subject has been determined referring to the concepts worked out by D. Blades [3]. According to this those activities which are not (although they should be) included in the official GDP figures are taken into consideration. However, for reasons of absence of a comparably solid methodological basis the production of illegal goods and services has not been taken into account. This also applies to employee theft (and shoplifting, too) because their impact on GDP is not always clear.

In substance such figures on the Hidden Economy will have to be of the same nature as published GDP components. This entails certain consistency implications as regards valuation; at the same time, it provides the advantage of obtaining a more comprehensive overall GDP and enabling consistent ratios to be derived of the importance of the Hidden Economy and its component parts.

Data Basis

Only official data have been used. These data cover a broad range of subject matter: numbers employed as well as owners of businesses and their relatives by activity classes, corresponding compensation of employees and other components of value added (economic censuses); working time by activity class (micro-census); turnover of small sized units by activity class (VAT statistics); numbers occupied by activity class (micro-census, population census); engagement in extra-occupational work (micro-census); local units by size and economic activities (establishment census); additionally, in exceptional cases, national accounts data. Due to the existence of an interlinking common system of activity classifications, these statistics have been exploited in combination. Because of availability of particularly comprehensive data or data useful in this context, 1976 has been chosen as the reference year.

Main Characteristics of the Estimating Technique

Main assumptions of decisive importance for the whole study referred to the fact that hidden activities cannot be assumed to be of equal (proportional) significance over all classes either for business activities or for non-observed quasi-business activities of employees. On the contrary, there are in both cases many situations in which hidden activities can hardly, if at all, be meaningfully attributed. This is true for producing units of large size, in particular for corporate businesses or government enterprises; and for many occupational activities. Identification and *a priori* exclusion of all those cases was therefore the initial basic step of the whole investigation. These assumptions alone quite dramatically reduce the possible range of the hidden part of the economy.¹

¹Cf. e.g. section on ML activities below.

The estimates have been made on a rather *detailed* level, which provides for various advantages:

- everyday knowledge of particular circumstances of the individual activities can be utilized in a "weighted" manner; in particular, as regards the possibility, or probability, of the occurrence of hidden activities at all, assumptions are more reliable;
- the importance of errors of estimation is reduced and more likely to be levelled out on the whole;
- results become available on classificational detail.

In accordance with the definition of the subject, the valuation of the hidden activities was undertaken in a way so that it is directly income-related and, in principle, GDP-consistent. (Therefore, data on the value of the flows of goods and services produced or consumed for this production are not available.)

Plausibility

Compatibility with economic experience and theory is a further feature which has been given attention, in particular in the ways chosen to determine actual figures on the basis of the above assumptions. Such considerations have e.g. affected the method of estimating the size of income of the self-employed likely to be hidden (relative to income likely to be expected); the method of valuation (relative to comparable non-hidden activities); or the assumption of local overconcentration of supply of hidden activities (not likely to find equivalent demand). Overall plausibility of the final outcome is also one further requirement that is quite legitimately given room in such a weak field where true control totals are almost not available at all.

The Main Components of Hidden Activities

With a view to the data basis as well as to differences in the organization and practice of the hidden activities two main streams have been distinguished:

- Hidden activities of the self-employed. These consist either of sales (to final users normally) of goods and services "off the records" or refer to declaration as intermediate consumption (production cost) of final consumption expenditure, or of both together. This part is called "off the records" (OR) activities in the following.
- Hidden activities of employees who engage either in their own profession, or in another if they are able to do so. These activities are called "moon-lighting" (ML) activities in the following.

It is to be mentioned that OR and ML activities can sometimes be found in combination (e.g. self-employed produce "OR" with the help of their own employees, paying their wages also "OR"). Within the present methodology this does not complicate the situation in principle.

Below the methods and the rationale of the estimates of OR and ML activities are described in more detail.

OR ACTIVITIES

Basic Model

For the self-employed data on overall working time are an important starting point, since working time is one of the variables determining income aspirations. Behaving as a rational "homo oeconomicus" a self-employed person would change his economic status if he does not earn the income he would earn on the basis of his (suitably valued) working time as an employee in this profession. Of course, such change would not always be easily realized but it may well be the case that he orients his income aspirations with a view to employees in his immediate neighborhood, and that he tries, therefore, to achieve this income level through machinations of the hidden type. On the basis of this philosophy estimates have been derived from economic census data, classified by economic activities and by output size of units, of the actual income of the self-employed and their relatives in terms of the operating surplus, net of interest and depreciation; as well as of the corresponding hypothetical income of an average employee in that branch (cf. Table 2).

The resulting pattern of the relation between actual income and hypothetical income and of the amounts by size class seems conclusive in itself and entirely in line with similar *ex ante* expectations: in the lower size groups average income of the self-employed is always smaller than the corresponding hypothetical income of employees; the difference diminishes when one moves up the scale towards higher size classes (normally both curves cross in the output class of 5–10 million AS). Beyond that, the *a priori* expected concentration of this phenomenon in branches with more direct contact to final demand has also been almost completely confirmed. The outcome of this approach depends on the level of disaggregation: the highest estimates would result if this approach was applied to each individual unit while on the more aggregate levels (as used in this study) the differences of the income curves are to some extent compensated; however, a broader "statistical" basis seems to have its own merits.

Supplementary Estimates

By this approach only those units actually observed in the census could be taken into account. The outcome had to be adjusted, therefore, with a view to the units missing in the official surveys and highly concentrated in the lower size groups. This adjustment has been made by reference to VAT statistics which are also classified by economic activities as well as size groups and are likely to represent a complete total.

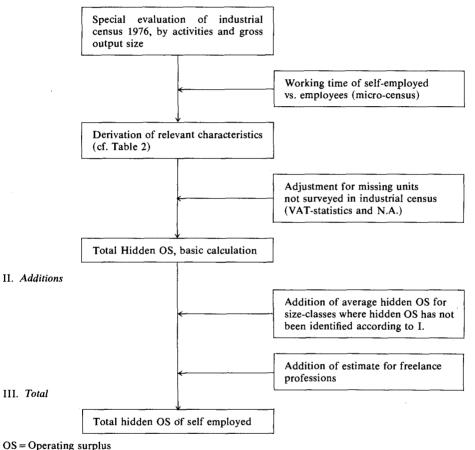
On the basis of the above results (which cover about 62 per cent of the total final estimate of OR activities) further additions seemed advisable to allow for the fact that also in higher size classes the existence of unrecorded activities cannot be completely precluded although their probability may diminish with increasing size of the enterprise. However, a model of design similar to that described above does not work in this context. One possible assumption, which has been used here, would be that those self-employed would on the average hide no less than the smaller ones. Further additions have been introduced for freelance professions not covered by the official censuses (physicians, lawyers, etc.).

The main concepts and data used are presented in Chart 1.

CHART 1

MAIN STEPS OF OR ESTIMATE

I. Basic calculation



ML ACTIVITIES

ML in Own Occupation²

Data on numbers employed by occupation is currently available (quarterly micro-census). The potential moonlighters have been found in several stages. *First* out of a two digit list of occupations those have been identified for which ML work cannot be precluded by the very nature of the activity. In a *second step*

²Exactly speaking, ML in own or other occupations suitable for ML.

out of a four-digit list used in the population census of 1971 the shares of those more narrowly defined occupations within the two digit classes have been identified for which actual exercise of ML work is realistic. That way the numbers of ML candidates were reduced from 2,410,000 (total employees) to 1,318,000 (*step 1*) and 775,000 (*step 2*). These data are available in a matrix form of occupations by economic activity.

In a *third step* above average local concentration of occupations has been allowed for in that reduction factors have been derived from a 1973 census on the basis of the employment figures by activity and size of the local unit. By this step, which takes into account a likely excess of supply of ML work, the total reduces even further to 494,000. The matrix displays the pattern of *potential* ML workers by occupation and economic activity of regular employment. The latter dimension is important for application of the reduction factor to step 2 data as well as, later on, of assumptions of ML time. However, the total of this matrix is still an over-estimation as it means that each employee occupied in one of the four-digit categories of the occupation list would engage in ML work provided there is no above average local concentration of those occupations—obviously a rather extreme assumption.

How to find out the numbers of probable *actual* moonlighters? Fortunately quite recently there was a time budget survey conducted as a special part of the regular microcensus, with voluntary answers (1981). Without direct reference to ML in this survey the respondents were asked whether they devote some extra time (beyond their normal occupation) to extra jobs or to craftmen's work (either in their homes or outside). While the answers on time spent on such work were often obviously not reliable the quotas of the yes/no answer seemed much more realistic. These ratios have been accepted as the basis for an estimate of numbers of actual ML workers in almost all cases where steps 1 through 3 yielded higher estimates. In the remaining cases the (lower) step 1 through 3 result has been maintained, or, as an exception only, an autonomous estimate has been inserted. That way 241,000 ML-workers have been identified by occupation (two-digits), which have been broken down then by activities by reference to the matrix of step 3 above (step 4).³ Because of the unreliable data reported on time the figures used for self-employed seemed more appropriate and have been introduced into this matrix by activity categories (step 5). Similarly, for valuation of compensation of employees, data used for the estimation of OR were also used in this context (step 6). As these figures are gross of taxes and employers' and employees' contributions to social security they may adequately reflect the motive of tax avoidance in these activities.

ML in Other than Own Occupation⁴, and Other Additions

Some occupations do not qualify for ML in their own category but may provide favorable prerequisites for ML exercised elsewhere. These occupations have been identified and valued in a procedure similar to (but more abridged than) that described above; they represent 23 percent of total ML only.

³This matrix of numbers of actual ML workers is a welcome by-product interesting in itself. ⁴See footnote 2.

Similarly, a rough estimate has been added to also take into account marginal groups (retired, students, housewives); the minimum variant of the above estimate on ML in other than own occupation has been inserted as a rough estimate (13 percent of the total).

The main steps and data used are displayed in Chart 2.

RESULTS

In 1976 OR and ML together represented an amount of 27.2 Billion AS, which equals 3.8 percent of GDP. A small proportion of ML work in the field of "one-family building" construction is already included in the official GDP so that the above percentage would reduce to 3.5. As it is not likely that on the whole these proportions change dramatically over time [4], in 1981 the whole hidden value added represented about 40 Billion AS (or 37 Billion AS if adjusted for elements already covered). The proportion of OR and ML respectively turns out quite similar, OR representing 47 percent and ML 53 percent (before adjustment).

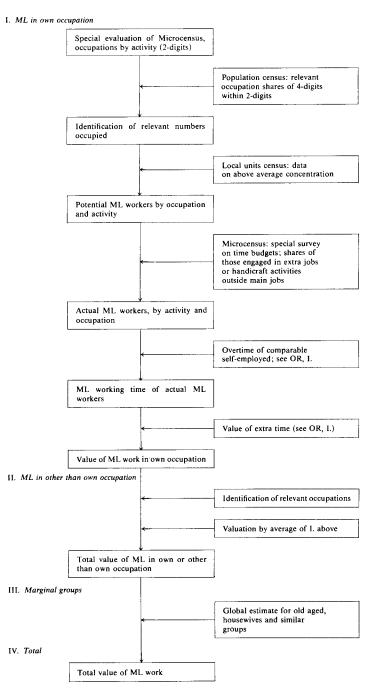
In the OR part hotels, restaurants and cafes are most important, followed by wholesale and retail trade, free-lance professions, manufacture of food and beverages and manufacture of wood products. In the ML part construction workers, metalworkers (including motor vehicle mechanics and plumbers), and employees in the transport field (drivers, transport workers, tourism specialists) are of predominant importance.

By and large the generally accepted ideas of the pattern of OR and ML activities in Austria have been confirmed by this study while the preconceptions of the size of the Hidden Economy have not been supported. This may be due mainly to an inadequate generalization of personal or official experience with OR or ML activities in certain fields. Taking into account only those branches which are suitable candidates for being affected by OR and/or ML activities their proportions turn out as high as usually maintained:

	Value added officially observed in units < 20	Hidden Activities										
	employees	OR		ML		Total						
	Mill.AS	Mill.AS	%	Mill.AS	%	Mill.AS	%					
Mining and quarrying	501	12	2.4	41	8.2	53	10.6					
Food and beverages	5,944	764	12.9	617	10.4	1381	23.2					
Textile manufacture	558	32	5.7	21	3.8	53	9.5					
Wearing apparel, shoes etc.	1,066	286	26.8	122	11.4	408	38.3					
Leather and leather products	139	25	18.0	2	1.4	27	19.4					
Manufacture of wood products												
sport articles etc.	4,443	444	10.0	661	14.9	1105	24.9					
Stone products, glass	966	34	3.5	145	15.0	179	18.5					
Manufacture of metal												
products	7,209	339	4.7	722	10.0	1061	14.7					

CHART 2

MAIN STEPS OF ML ESTIMATES



Similar relations are found for retail trade (OR+ML: 7 percent) as well as hotels and restaurants (OR+ML: 11 percent). Related to observed gross output of residential building construction corresponding ML activities (excluding plumbing) amount to about 12 percent.

The main results of the study are displayed in Table 1, for reasons of presentation in a somewhat aggregated form.

References

- As one recent example using similar methodological considerations cf. Richard Rose, Getting by in Three Economies: The Resources of the Official, Unofficial and Domestic Economies, Studies in Public Policy, No. 110, Centre for the Study of Public Policy, University of Strathclyde, pp. 20-23.
- [2] Franz, A. VGR-bezogene Schätzungen auf Basis amtlicher Statistiken, Wien 1983 (mimeo). This study is part of a rather comprehensive research project on the "Parallel Economy" in Austria sponsored by the Austrian National Bank (Project Moderator: J. Skolka). The project report was published in "Die andere Wirtschaft", Signum Verlag, Vienna, 1984.
- [3] Blades, D. W. (1982), The Hidden Economy and the National Accounts, Economic Outlook, Occasional Studies, OECD, Paris.
- [4] Cf. P. Mooslechner, Der monetäre Ansatz zur parallelen Wirtschaft. Eine empirische Illustration an Hand österreichischer Daten, Wien 1982 (mimeo; part of the above mentioned research project). This study concludes that on the basis of financial indicators it is not likely that the Hidden Economy has increased significantly in the past decade.

	l Agriculture and Forestry	4 Electricity, Gas & Water	2 Mining and Quarrying	31 Food, Beverages, Tobacco	32 Textiles Wearing Apparel, Leather	33 Wood Products	34 Paper, Printing and Publishing	35 Chemical Products and Refineries	36 Non- Metallic Mineral Products	37 Metal Industries	5 Constructio
1L Activities											
ML in own occupation											
Agricultural occupations (mainly											
gardeners and florists)	220	0	_	_		-	0		_		_
Construction, stone and pottery											
workers	_	3	8	11	3	20	1	2	82	31	2,614
Metal workers (incl. plumbers											
and installers)	2	228	15	29	7	22	5	12	16	618	656
Wood manufacture workers	_	7	_	2	1	566	0	2	2	14	25
Tailors, shoemakers etc.	_	_		1	119	16		1	_	2	_
Printers and related occupations	_		_	0	1	_	70	1	1	1	2
Food, beverages and tobacco											
occupations	2	_	_	413		_		_	—	—	3
Occupations in transport and											
tourism industries	17	13	18	146	6	32	10	9	37	30	229
Waiters, cooks and related											
activities		_	_	3	0			0	0	0	
Maids, janitors and related											
domestic service workers	1	—	_	0	-		0	_	0	0	_
Charwomen, cleaners, laundry											
women etc.	_	3	0	3	4	1	1	2	1	3	7
Hairdressers, barbers, beauticians											
etc.	_		_			_	_	1	_	1	_
Construction engineers,											
draughtsmen	_	6		_	1	2	1	0	0	12	62
Accountants, cashiers and											
related occupation	2	3	0	7	2	2	1	1	2	6	11
Other (teachers, scientists,											
journalists, actors, artists, etc.		—		—	3		25	1	4	2	4
1L in own occupation					·						
Σ	244	263	41	615	147	661	114	32	145	720	3,613
ML in other than own occupation											
Marginal groups											••
Σ Total ML											
OR Activities											
By activity class	_		12	764	343	444	16	33	34	339	384
Unspecific additions											
Freelance professions											
Σ Total OR									••		•••

 TABLE 1

 The Hidden Economy in Austria, 1976 (Million AS)

	61, 62 Wholesale and Retail Trade	63 Hotels and restaur- ants	7 Transport and Communi- cation	831 Real Estate	Other 8 Financial and Business Services	Ex 9 Body Care	Other 9 Other Personal Services: Government	Other (n.e.c.)	Total	Of which: included in official GDP	TOTAL Adjusted ("Unrecorder GDP")
IL Activities											
L in own occupation											
Agricultural occupations											
(mainly garderners and											
florists)	12	_	_		1	0	8	-	241		241
Construction, stone and pottery											
workers	3	2	7		_	2	111		2,900	2,200	700
Metal workers (incl. plumbers and											
installers)	143	18	129	_	8	—	111	_	2,019	_	2,019
Wood manufacture workers	27	_	2	—	6	1	19	1	675	_	675
Tailors, shoemakers etc.	17	3		_	0	1	12	_	172	_	172
Printers and related occupations	2	_	1	_	10	_	6	—	95		95
Food, beverages and tobacco											
occupations	4	6	_	_		—	3		431	_	431
Occupations in transport and											
tourism industries	233	0	699	_	5	9	88	4	1,585	_	1,585
Waiters, cooks and related activities											
	1	121	1	3	1	_	24	—	154	_	154
Maids, janitors and related domestic											
service workers	_	3		198	1	—	47	1	251	_	251
Charwomen, cleaners, laundry											
women etc.	15	3	12	10	10	11	121		207	_	207
Hairdressers, barbers, beauticians											
etc.	2	—	_	_	_	102	25		131	_	131
Construction engineers, draughtsmen	4	_	4	_	11		11		114	_	114
Accountants, cashiers and related											
occupations	36	1	4	—	19	_	11	0	108		108
Other (teachers, scientists,											
journalists, actors, artists, etc.	57	12	12	0	21		772	_	913	—	913
Σ ML in own occupation	556	169	871	211	93	126	1,369	6	9,996	2,200	7,796
ML in other than own occupation				_				2,829	2,829		2,829
Marginal groups	••		••					1,600	1,600		1,600
		••		••							
Σ Total ML					• •		••	4,429	14,425	_~	12,225
OR activities							_				
By activity class	2,077	2,352	684	—	106	336	5		7,929	_	7,929
Unspecific additions	••	••	••			••	••	3,796	3,796		3,796
Freelance professions						••	••	1,036	1,036		1,036
Σ Total OR				••				4,832	12,761	—	12,761

	(1) Establishments	(2) Self-Employed (3)+(4)		(3) wners R	(4) elatives	(5) Employees (6)+(9)	(6) Workers and Salary Earners (7)+(8)	(7) Workers	(8 Salary F		(9) Other Employees
Gross output per	unit ⁴										
- 0.25	31,042	39,193		31,557	7,636	8,525	6,380	4,260	2	2,120	2,144
0.25- 0.50	21,967	28,680		22,317	6,363	19,810	15,325	10,789		,537	4,485
0.50~ 1.00	28,229	38,307		29,217	9,090	46,366	37,621	25,787	1	,834	8,745
1.00- 5.00	58,552	74,533		58,850	15,683	267,407	220,731	141,833	71	8,898	46,676
5.00- 10.00	13,022	15,443		12,277	3,166	164,563	140,476	88,160	52	2,316	24,088
10.00- 50.00	11,826	11,714		9,381	2,333	396,073	358,971	222,260	130	5,711	37,102
50.00-100.00	1,861	1,263		1,074	189	167,547	157,431	91,595	65	,836	10,117
100.00-	1,980	881		744	137	824,520	791,620	414,034	37	,586	32,900
Total	168,479	210,014		165,417	44,597	1,894,813	1,728,556	998,719	72	,837	166,257
<u> </u>	(10) Compensation of Employees ³ (11) + (14) + (15)	(11) Wages and Salaries ³ (12)+(13)		(12) 'ages ³ S	(13) alaries ³	(14) Other Compensation ³	(15) Employers' Social Security Contributions ³	(16) Gross Output	(17 ³ Value A		(18)) Interest (Outlay) ³
Gross ouput per i	ınit ⁴										
- 0.25	386.5	287.3		180.5	106.8	38.3	60.9	3,798.2	1	/13.4	112.9
0.25- 0.50	1,177.7	897.5		612.4	285.1	89.2	191.0	8,033.2		501.2	215.1
0.50~ 1.00	3,486.8	2,717.3		1,797.8	919.5	187.6	581.9	20,543.9		354.9	578.6
1.00- 5.00	26,292.4	20,615.9		2,409.5			4,510.7	136,159.4		203.0	4,520.4
5.00- 10.00	19,365.5	15,281.9		8,454.1	6,827.8	1,165.8 665.2	3,418.4	90,865.4		352.6	3,464.9
10.00- 50.00	54,160.3	43,171.6			20,827.3	1,118.8	9,869.9	247,040.7		544.1	9,621.6
50.00-100.00	26,079.8	20,868.1			10,917.6	313.1	4,898.6	129,727.0		266.7	5,908.9
100.00-	151,672.1	115,234.8	4	1,508.6	63,726.2	964.6	35,472.7	770,319.6	233,		42,937.8
Total	282,621.1	219,074.4	107,257.7		11,816.7	4,542.6	59,004.1	1,406,487.4		306.0	67,360.2
	(19)		(21)	(22) Hypothetical	(23) Hyp. comp.	(24) Tatal abarrad	(25)	(26)	(97)	(10)	
	Depreciation		Overtime	Compensation of		Total observed 0S ³	(25) Observed OS,	(26) Total	(27) Hidden OS ⁴	(28)	(29)
	(p.c. of v.a.)	(20)	Addition	Employees,	per Capita	(17)-(10)-	Per Capita	Hidden OS ³		Hidden OS,	p.c. of
	(20):(17)	Depreciation ³	(p.c.)	Total ^{2,3}	(22):(6)	-(18)-(20)	(24):(2)	(27)×(2)	Per Capita (23)-(25)	p.c. of v.a. (26):(17)	Gross Out (26):(24
Gross output per											
- 0.25	19.8	339.0	51.8	517.6	81	875.0	22	2,021.5	52	118.0	231.
0.25- 0.50	15.2	532.9	52.8	1,636.8	107	1,581.3	55	1,283.8	45	36.6	81.
0.50- 1.00	13.3	1,110.4	56.1	5,090.2	135	3,179.1	83	1,643.5	43	19.7	51.
1.00- 5.00	11.8	5,587.1	56.9	39,052.3	177	10,803.1	145	1,241.0	17	2.6	11.
5.00- 10.00	11.5	3,611.6	55.1	28,785.1	205	4,910.6	318	29.6	2	0.1	0.
10.00- 50.00	11.0	9,233.1	52.4	80,452.9	224	10,629.1	907	0.4	õ	0.0	0.
50.00-100.00	11.1	4,355.5	49.9	38,508.2	245	2,922.5	2,314	0.9	1	0.0	0.
100.00-	14.1	33,039.3	42.2	213,924.0	270	6,114.9	6,941	0.0	0	0.0	0.
Total	12.9	57,809.0	47.3	407,967.1	236	41,015.5	195		-		0.

TABLE 2OR Activities (Basic Calculation)1

¹ Before any completions and additional estimates. Calculations can be duplicated only on the most disaggregated level (not shown here).²

336

³ Mill.AS ⁴ Thousand AS

100+(21) (11) $\frac{\frac{1001(21)}{100}}{1 - \frac{(15)}{(10)}}$