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THE SIZE AND GROWTH OF THE HIDDEN ECONOMY IN NORWAY

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The present size of the hidden economy in Norway is between 4 and 6 percent of GDP, of which hidden labor income constitutes about half. A survey approach reveals that 4/5 of the population is of the opinion that people in general accept income from moonlighting that is not reported, and 2/3 believes that this share of acceptance is on the increase. Furthermore, surveys clearly show that hidden labor services are of satisfactory quality, that they mainly are paid for in cash, but with checks being increasingly used, and that buyers find it easier to obtain services from the hidden labor market than from the regular one. A shortening of the work week in order to alleviate unemployment may result in an increased supply of hidden labor.

1. INTRODUCTION AND SUMMARY

In addition to reporting two tries at estimating the size and growth of the hidden economy in Norway (section 2 and 3), the purpose of this paper is:

- To summarize the main findings of two surveys (in 1980 and 1983) on the hidden labor market in Norway (section 4).
- To tentatively discuss certain aspects of the hidden labor market such as quality of the working force, paucity of information and pricing rules (section 5).
- To analyze a special case, i.e. labor market behaviour of married couples where the husband works in the "white" sector but with the opportunity of underreporting his income. The wife on the other hand only has work opportunities in the "black" labor market (section 6).

The main conclusions are summarized as follows:

- It is extremely difficult to arrive at any precise and reliable estimate of the size of the hidden economy in Norway (in any country, we would venture). Our educated guess is that the hidden economy in Norway now constitutes 4–6 percent of GDP, of which about half is hidden labor income.
- The Cagan-Gutmann method for estimating the growth of the hidden economy in Norway in the 1970s gives unreasonable results. It is very hard to believe that the hidden economy decreased from 1.4 percent of GDP in 1972 to 0.6 percent in 1973, and then in leaps jumped to 6.3 percent in 1978.
- The survey studies suggest that as much as 35 percent of the adult population in a 12-month period at least once bought and/or sold hidden labor services.

- About 80 percent of services rendered in the hidden labor market are paid in cash. People availing themselves of services in the hidden labor market are satisfied with the quality of work and in general they find black services more easily available than white ones.
- About 4/5 of the population believe that people in general find the hidden labor market acceptable, and 2/3 expects it to become increasingly so. Also, about 2/3 of the population foresees a growing hidden labor market.
- Imperfect information in the hidden labor market paves the way for mechanical pricing rules rather than a Walrasian auctioneer. In Norway in some trades a practice may have developed whereby the buyer, in making use of the black rather than the white labor market, saves the value added tax (20 percent) and the seller his marginal income tax (which on average was close to 50 percent in 1982).
- Based on the fitting of a tax function to the existing tax rules in Norway, and on an additive utility function, it is shown that for couples reduction in the regular working hours for one makes the other work more in the hidden economy.

2. SIZE AND GROWTH OF THE HIDDEN ECONOMY —A MONETARY APPROACH

This section draws heavily on the thorough work of Klovland (1980). With minor modifications his model and results for 1978 are reproduced. Next we employ his measure of excess cash to calculate annual growth rates of the hidden economy. Finally, some critical comments as to the reliability of this approach are given.

2.1. *The Hidden Economy in 1978*

This method of estimating the size of the hidden economy is based on the demand for currency. It is contended that higher tax rates promote tax evasion, which, in turn, increases the demand for currency (Cagan 1958, Gutmann 1977, Tanzi 1982). To model behavior the following variables are needed:

C = currency held by the public

P = price index

Y = real GDP

i = rate of return on time deposits

π = rate of inflation

CON/Y = private consumption as a share of GDP

t = total taxes as a share of GDP

θ = stock adjustment parameter $0 \leq \theta < 1$

Klovland specified his model as follows:

$$(1) \quad \ln C - \ln C_{-1} = \theta(\ln C^* - \ln C_{-1})$$

where C^* is the long run demand for currency.

$$(2) \quad \ln \frac{C^*}{P} = \alpha_0 + \alpha_1 \ln Y + \alpha_2 i + \alpha_3 \pi + \alpha_4 \frac{CON}{Y} + \alpha_5 t.$$

+ - - + +

The signs below the equation give the expected signs of the coefficients.

These coefficients were estimated by a single-equation approach. A fourth-degree Almon lag of the tax variable was employed since the effects of higher tax rates on tax evasion are likely to be spread out in time. The coefficient attached to the tax variable, α_5 , is the sum of lagged coefficients. Annual data were used, covering the period 1952-78.

The estimation gave the following result (t -values in the parentheses):

$$(3) \quad \ln \frac{C}{P} = -1.250 + 0.309 \ln Y - 0.024i + 0.003\pi + 0.001 \frac{CON}{Y}$$

(3.65) (3.41) (2.54) (0.03) (1.44)

$$+ 0.007 t + 0.534 \cdot \ln C_{-1}/P$$

(2.70) (4.73)

All the estimated coefficients, except for the coefficient attached to the inflation rate, have the expected signs.

To proceed with the estimation of the size of the hidden economy we rewrite (3) as

$$(4) \quad \ln C = \ln P + Z\hat{\alpha} + \hat{\alpha}_5 t$$

where the term $Z\hat{\alpha}$ includes the α 's and variables except for the tax rate. $\hat{\alpha}$ and $\hat{\alpha}_5$ are estimated values.

Predicted currency holdings at time τ is then

$$(5) \quad \hat{C}_\tau = \exp(\ln P_\tau + Z_\tau \hat{\alpha} + \hat{\alpha}_5 t_\tau).$$

In order to obtain an estimate of the size of the hidden economy we selected 1952 as a base year. Thus, if the tax rate had remained at the 1952 level, the predicted value of currency holdings would have been

$$(6) \quad \hat{C}_{52,\tau} = \exp(\ln P_\tau + Z_\tau \hat{\alpha} + \hat{\alpha}_5 t_{52}).$$

The difference, $\Delta C_\tau = \hat{C}_\tau - \hat{C}_{52,\tau}$ would then give the increase in the amount of currency needed to fuel the tax evasion part of the economy compared to the currency needs if tax rates had remained at the 1952 levels. We next assume that no tax evasion took place in 1952 or in years before that. ΔC_τ would then yield an estimate of all currency circulating in the hidden economy at time τ . Inserting observations for the assumed exogeneous variables we obtain the following estimate for $\tau = 1978$.

$$(7) \quad \Delta C_{1978} = 2.9 \text{ billion N kr.}$$

To complete the story we need an estimate of the income velocity of currency. Due to the Norwegian bank-giro system transaction balances have been enlarged to include a fraction of time deposits. Thus, the transaction balances employed,

M1, include total currency, ordinary cheque accounts, wage accounts, postal giro deposits and 10 percent (a qualified guess) of total time deposits. In accordance with Tanzi (1980) and others we assume that the income velocity of currency in the hidden economy equals the velocity of M1 money in the official parts of the economy. Hence, for 1978 we obtained

$$(8) \quad V_{1,78} = \frac{Y_{78}}{M1_{78} - \Delta C_{78}} = 5.0$$

where $V_{1,78}$ is the velocity rate, Y_{78} is the official GDP in 1978, $M1_{78}$ is M1 money in 1978 (with parts of time deposits included as explained above) and ΔC_{78} is estimated in (7).

Let Y_{78}^B denote the GDP contribution from the black economy in 1978, to obtain,

$$(9) \quad Y_{78}^B = V_{1,78} \cdot \Delta C_{78} = 5.0 \cdot 2.9 = 14.5 \text{ billion N kr.}$$

and

$$(10) \quad \frac{Y_{78}^B}{Y_{78}} = 0.063.$$

So that the black economy was 6.3 percent of registered GDP in Norway in 1978.¹

2.2. GROWTH OF THE HIDDEN ECONOMY 1971-78

Rewriting (8) and (9) in more general form gives

$$(11) \quad V_{1,\tau} = \frac{Y_{\tau}}{M_{1,\tau} - \Delta C_{\tau}}$$

$$(12) \quad Y_{\tau}^B = V_{1,\tau} \cdot \Delta C_{\tau}$$

By inserting (11) into (12) and taking the unobserved economy as a fraction of the observed one, we have

$$(13) \quad y_{\tau}^B = \frac{Y_{\tau}^B}{Y_{\tau}} = \frac{\Delta C_{\tau}}{M_{1,\tau} - \Delta C_{\tau}}.$$

Based on dynamic post-sample simulations Klovland (1980, p. 32) has calculated the difference between the actual and predicted stock of cash, where predictions are based on the tax rules as of 1952. Using this difference as a proxy for ΔC_{τ} , the relative size of the hidden economy for the years 1971-78 was calculated. The results are given in Table 1.

We consider it highly unlikely that the unobserved economy as a percentage of the observed one, roughly speaking, was halved from 1972 to 1973 only to treble from 1974 to 1975, and then double again in the period 1975-78. The contention that the cash approach to measuring the hidden economy gives unreasonable results is substantiated by Klovland's re-estimation of the demand

¹ Klovland (1980) employed a narrow definition of the money stock and arrived at a higher velocity, i.e. 6.7. As a percentage of observed GDP, the black economy then becomes 9.2.

TABLE 1
THE UNOBSERVED ECONOMY AS
PERCENTAGE OF THE OBSERVED
ECONOMY, 1971-78

Year	$y_{\tau}^B = \frac{Y_{\tau}^B}{Y_{\tau}} \cdot 100\%$
1971	1.3
1972	1.4
1973	0.6
1974	0.8
1975	2.6
1976	4.3
1977	4.7
1978	6.3

for cash in Norway; proper modifications of equation (2) yield improved empirical results, however, at the cost of an insignificant tax variable (Klovland 1983). With the exit of the tax variable from (2) the hidden economy also disappears.

2.3. SOME CRITICAL REMARKS ON THE CASH APPROACH

To anticipate one result of our two surveys (conducted in 1980 and 1983), as much as 82 percent of hidden labor services were paid in cash. This finding certainly yields plausibility to the assumption that tax-evading activities are settled in cash. However, the hidden economy encompasses more than labor services and the means of payment here we have no measure of. With checking accounts becoming more common, especially as workers are paid by transfer to their "wage-account" with the bank rather than in cash, it is not unlikely that checks increasingly are used as a means of payment in the hidden economy.

For the payee payment by check does not leave any trace if the check is cashed or if it is made payable to the payor, and signed by him on the back. In the context of the hidden economy this implies that checks become a very close substitute to cash.

The use of bank-giro, on the other hand, requires that the receiving as well as the paying bank keep a copy of the order to transfer. Such copies are easily controlled by the IRS. As the public becomes more aware of the indeed very limited possibilities of controlling payments by checks (as opposed to giro) one would expect checks to become an increasingly used means of payment in the hidden economy.

A more serious problem with the cash approach is the underlying assumption of a stable demand for currency in the observed economy. In the U.S. in the mid-1970s the predictions of the money stock ($M1$) based on conventional money demand equations resulted in consistent and considerable overpredictions. This episode of "missing money" is analyzed by Judd & Scadding (1982) who conclude that the most likely cause of the observed instability in the demand for money after 1973 is innovation in financial arrangements (p. 1014). Financial innovations,

partly prompted by regulations and high inflation rates, have been introduced in Norway as well. More widespread use of credit cards, increased liquidity of various interest-bearing bank deposits etc. make for closer substitutes for currency. Thus, the stability of an estimated demand for currency equation is likely to be impaired, and calculations of "tax-induced" cash holdings to be more cumbersome and less reliable (cf. Klovland's new finding, reported above, that the tax parameter no longer is significant in the demand for currency equation).

The assumption that the income velocity of money is equal in the observed and unobserved economy is a crucial assumption in need of empirical verification. Suffice it here to make two observations. First, as Cagan (1958) observed, "black cash" to a greater extent may be used as a store of value, implying that its velocity is lower than its "white" counterpart. In this case the cash method exaggerates the size of the hidden economy. Second, Feige (1979) contends that unobserved economic activity is service-intensive, implying that value added per dollar transacted is higher in the unobserved sector than in the observed parts of the economy. For a given amount of "black" transactions the GDP content is higher than for a similar amount of "white" transactions. On this score the cash method thus tends to underestimate the size of the hidden economy.

A final remark on the cash approach is related to the international role of a country's currency. In the post World War II period the dollar has come to be extensively used both as a store of value and as a means of payment in other countries. In open economies plagued by two- and three-digit inflation rates, e.g. countries in Latin-America, Iceland, Israel etc., dollar bills have been available and most likely increasingly been used for domestic transactions. Excess issue of U.S. currency, not accounted for by observable domestic factors, may thus be floating around in other countries rather than supporting hidden economic activities within the U.S. Hence, the high estimates of the hidden economy for the U.S. as reported by Feige and Gutman could be biased upward. Less biased estimates (cf. Tanzi 1982) available for the U.S. economy are more in line with the estimates given in the present paper for the Norwegian economy.

In summary, Gutmann's 4-page paper in *Financial Analysts Journal* in 1977 is remarkable in the sense of generating extensive research in the area of unobserved economic activities. However, thorough application of the cash method to estimate the size and growth of the hidden economy in Norway gives untenable results. Hidden economic activities, which we consider likely both to be important and on the increase, thus require other approaches. Thus, we now turn to estimations based on survey studies.

3. SIZE AND GROWTH OF THE HIDDEN ECONOMY—SURVEY APPROACH

In September 1980 and again in April 1983 a private polling institute undertook a survey on hidden economic activities in Norway. In both surveys about one thousand people were asked to fill in a questionnaire and mail it back to the institute. And in both surveys about 70 percent complied with this request.

The method and main findings of the 1980 survey are reasonably well documented in Isachsen, Klovland & Strøm (1982). The analysis of the 1983 survey has barely begun. Suffice it to say that the findings suggest a modest but

not significant decline in hidden labor market activities.² Stratifying the sample according to sex and age, the picture revealed in Table 2 emerges.

TABLE 2
PARTICIPATION RATES
IN THE HIDDEN LABOR MARKET

	1980	1983
1. Worked unregistered last 12 months	18	16
2. Paid for unregistered work last 12 months	26	25
3. Worked and paid	6	8
4. (1+2-3) Participated in the hidden labor market	38	33

Taking the average one arrives at a figure of 35 percent, with the 95 percent confidence interval being bracketed by 32-38 percent.

In Isachsen, Klovland & Strøm (1982, p. 215) we offer various estimates of the size of the hidden labor market, arriving at 2.3 percent of GDP as the most reasonable one. Applying the same approach to the 1983 survey yields a figure of about 2 percent.

In the 1983 survey a new question appeared, namely *total* income unreported in the income declaration last year. Comparing total undeclared income to hidden labor income, the latter constitutes 65 percent of the former. Putting some confidence in the 2 percent figure as a measure of the size of the hidden *labor* market in 1983, one arrives at an estimate of the size of the hidden *economy* of about 3 percent of GDP.

However, our feeling is that a correction item is called for to counter the unavoidable downward bias in the answers, especially so for income not declared last year. Thus, as an educated guess we suggest the present size of the hidden economy being between 4 and 6 percent of GDP, of which hidden labor income constitutes about half. The size has remained unchanged over the last few years.

4. FURTHER RESULTS FROM THE SURVEYS

Neither space nor time allow us to give the detailed picture of the hidden labor market in Norway as it emerges from the surveys. In this section we confine ourselves to reporting some findings on:

- detection
- attitudes and growth
- experience of buyers.

Currently, participation rates in the hidden labor market according to socio-economic variables such as sex, age, education and geographical location are

² The publication of our 1980 findings generated considerable stir about tax cheating in Norway. It may be the case that the increased concern by the media as well as by the politicians (does the media dictate what politicians should be concerned about?) have made people somewhat more reluctant to admit cheating in our 1983 survey. The fact that the response rate decreased by 3-4 percentage points may indicate such a trend.

being analyzed. It is very likely that the 1983 survey will reproduce the 1980 findings (see Isachsen, Klovland & Strøm 1982), which can be summarized as follows:

- Men are more active in the hidden labor market than women.
- The participation rate in the hidden labor market decreases with age (youngest age group recorded, 18-24 years old).
- Based on years of education the participation rate in the hidden labor market first increases and then decreases, i.e. people with 8-12 years of schooling, e.g. vocational training, are most heavily involved.
- Looked at from the buyer's side, the demand for hidden labor services increases with education.
- The rendering of hidden labor services is equally common in the cities and in the countryside.

4.1. Detection

The results of two questions on detection are reported in percentages in Tables 3 and 4.

TABLE 3

WHICH OF THE REASONS LISTED BELOW DO YOU THINK PEOPLE IN GENERAL BELIEVE MOST EASILY WILL LEAD TO DETECTION OF UNREPORTED INCOME

	1980	1983
High level of consumption compared to income	29	29
The authorities' effort in general in discovering tax evasion	16	15
Reported to tax authorities by neighbors/acquaintances	4	5
Acquaintances working with the IRS	1	1
Previously been detected for tax evasion	2	5
Spot checks	28	31
Don't know	20	14
	100	100

TABLE 4

HOW DO YOU THINK PEOPLE IN GENERAL EVALUATE THE LIKELIHOOD OF DETECTION IF NOT REPORTING INCOME FROM MOONLIGHTING?

	1980	1983
Most likely to be detected	5	2
Likely to be detected	4	3
Perhaps detected	30	31
Likely not to be detected	43	47
Most likely not to be detected	14	12
Unanswered	4	5
	100	100

Information on how the authorities go about detecting tax evasion is not available. However, it seems reasonable that conspicuous consumption and the authorities' efforts in general as well as spot checks are most important in revealing tax evasion.

Concerning the likelihood of detection the first two options, i.e. most likely to be and likely to be detected, are down from 9 percent in 1980 to 5 percent in 1983. However, adding the perhaps option the figure comes to an astonishing 36 percent in 1983. With the authorities' very modest success in revealing tax evasion, our educated guess on the likelihood of detection more properly is most likely not detected. If our guess is correct the majority exaggerates the risk of being caught.

However, the likelihood of detection:

- decreases with education and income (better insight?)
- is lower for craftsmen (experience?)
- is lower for men than for women (insight and experience?)

The surveys further revealed that people with low income tend to exaggerate their marginal tax rate. The basis for this conclusion is a comparison between the reported marginal tax rates and the marginal tax we can calculate on the basis of the answers on net and gross income. Perceived tax rates are higher than the true ones, but misperception decreases with income. This might reflect stronger incentives for well-paid people to know the true tax rates, but also the fact that there is an upper bound on the marginal tax rate (around 75 percent). Further, as income and education are positively correlated, higher education may make people increasingly aware of the true tax rates. Provided that higher marginal taxes induce people to more unreported economic activities and that higher likelihood of detection works in the opposite direction, it may be the case that some people offer their optimal hours of work in the hidden labor market in spite of incorrect perception of the underlying parameters.

4.2. *Attitudes and Growth*

In an attempt to reveal the general attitudes towards hidden labor income the following two questions were posed:

- Do you think people in general accept that income from moonlighting is not reported, or do you think people in general don't accept nonreporting of such incomes?
- Do you think people in general increasingly will accept nonreporting of income from moonlighting or decreasingly so?

A third question was related to one's own perception:

- Do you think that unreported income from moonlighting will increase or decrease?

The answers in percentages to these three questions are summarized in Table 5.

Roughly speaking, the table indicates that moonlighting increasingly is believed to be accepted (up from 76 percent in 1980 to 80 percent in 1983). This trend is expected to continue and unreported income from moonlighting is expected to increase.

TABLE 5
ATTITUDES AND GROWTH

	1980	1983
(1) Moonlighting and non-reporting in general is accepted	76	80
Not accepted	6	5
Don't know	18	14
Unanswered	—	1
	—	—
	100	100
	—	—
(2) Moonlighting and non-reporting in general will become more acceptable	67	68
Less acceptable	13	14
Don't know	20	17
Inanswered	—	-1
	—	—
	100	100
	—	—
(3) Moonlighting and non-reporting will increase	65	63
Decrease	7	9
Don't know	28	27
Unanswered	—	1
	—	—
	100	100
	—	—

In commenting on these results a leading Social Democrat expressed concern that people's attitude towards tax evasion reminded him about people's attitude towards home-made liquor, both types of activities being illegal, but nevertheless growing and increasingly considered acceptable by the common man.

To get a firmer grasp on people's attitudes towards tax policy in the welfare state four statements were presented and the respondent was asked whether he agreed or not. Table 6 summarizes the findings, in percentage distribution.

Comparing the first two columns of Table 6 the "moral standard" seems elevated; although a solid majority still finds the tax burden an impediment to working overtime, the percentage is down from 80 in 1980 to 68 in 1983. Further, there is a growing understanding of the welfare state requiring the present levels of taxes (up from 31 percent to 39 percent). On understanding people's desire for unreported income the percentage is down although 2/3 still agrees with the statement. Finally, about 1/3 feels that tax evaders should be severely punished, up from 1/4.

Summing up, it seems somewhat difficult to reconcile the answers reported in Tables 5 and 6. It should be kept in mind, however, that the first two questions in Table 5 reveal one's perception of (other) people's attitudes in general, i.e. an excursus in positive economics, whereas the statements in Table 6 try to capture one's own attitudes and are more normative in nature. An attempt at reconciling the two tables may thus run as follows:

In the early 1980s people in Norway became increasingly inclined to think that moonlighting is accepted by the common man although the individual himself became somewhat more sceptical about the tendency of increased tax evasion.

TABLE 6
ATTITUDES TOWARDS TAX POLICY IN THE WELFARE STATE

Do you agree or disagree with the following statements?	Agree		Neither agree nor disagree		Disagree		Don't know/unanswered	
	1980	1983	1980	1983	1980	1983	1980	1983
(1) Tax burden so heavy that people are not interested in working overtime	80	68	9	14	5	10	6	8
(2) The welfare state necessitates present level of taxes	31	39	22	23	32	22	15	16
(3) Understandable that people like to get work where income goes unreported	73	66	13	16	6	7	8	11
(4) Tax evasion should be punished severely	25	32	40	37	16	12	19	19

4.3. Experiences of Buyers

In both surveys about 25 percent of the respondents acknowledged in the previous twelve month period at least once having paid for services rendered where the income was unlikely to be reported. A closer study of buyer's experiences is rewarding.

First, in both surveys 82 percent of buyers reported that hidden labor services were paid in cash. The use of checks increased from 5 percent in 1980 to 11 percent in 1983.

Second, on the quality of work an overwhelming majority of the buyers expressed satisfaction; more than 19 out of 20 in each survey. This finding sharply contradicts the allegation put forward by the Federation of Craftsmen to the effect that hidden labor services are of inferior quality. The rationale for such an allegation is perhaps found in the Federation's desire to limit competition in their own trades. By trying to convince people that payment without receipt is tantamount to inferior work, they try to fend off new competitors, i.e. "le travailleur noir."

However, this is a two-edged sword. Many a member of the Federation of Craftsmen obviously offers his own services or those of his firm in the hidden labor market. Minor repair jobs the firm may distribute among their craftsmen to be undertaken as hidden labor, sometimes during the regular hours of work.

Also it is becoming commonplace when buying e.g. a washing machine that the store can supply you with a plumber after 5 p.m. to install the machine, on the understanding that payment is made without receipt.

In certain crafts such as auto repair some shops offer a 4 day work week, with the opportunity of utilizing the facilities also the fifth day. The popularity

of such a scheme most likely is related to the opportunity it offers for tax evasion on the part of the mechanics.

Third, in terms of availability of labor services, almost 60 percent of the buyers in both surveys contended that black services were more easily available than white ones, whereas 36 per cent in both surveys indicated no difference. This leaves us with less than 5 percent considering it more difficult to get black rather than white services undertaken (2 and 3 percent respectively left this question unanswered).

Summing up, the surveys clearly show that hidden labor services are of satisfactory quality, that they mainly are paid for in cash, although checks are increasingly used, and that the buyers find it easier to obtain services from the hidden labor market than from the regular one.

5. SOME TENTATIVE OBSERVATIONS ON THE HIDDEN LABOR MARKET

From a journalistic point of view the most fascinating aspects of the hidden economy seem to be its size and growth and the amount of tax evasion it implies. Such information also is of interest to the economist. However, in order to get a better understanding of the impact of the hidden economy on the total one, we should like to have more detailed knowledge. In this section we offer some comments on how positive shifts in demand and supply schedules in the hidden labor market affect its size, on possible effects of imperfect information, and on the productivity of tax-evading workers.

For macroeconomic planning purposes it is useful to know how changes in various parameters affect the supply of labor. Provided that the hidden labor market already is of some size and perhaps also on the increase, there is a need for studying labor market behavior within a model allowing for a dual labor market, i.e. an observed as well as an unobserved sector. The final section of this paper takes up the special case of a couple's supply of labor in such a setting.

5.1. *Impact on Size of Shifts in Demand and Supply*

Over the last decade or so a variety of factors seem to indicate that in the hidden labor market outward shifts in both supply and demand schedules have taken place. Among factors pushing the supply curve outwards the following are often mentioned:³

- Increased tax burden.
- A growing labor force, and an especially rapid growth in lower age groups. (Our surveys indicate that supply of hidden labor decreases with age.)
- Substantial increase in the pool of the unemployed.
- Reduced regular work week.
- Technical progress which makes chores less time-consuming (e.g. washing machines, prepared food etc.).
- Changing attitudes, i.e. unreported income more acceptable (cf. survey).
- Alienation. Henry (1978) maintains that the hidden labor market is more conducive to social relations than the impersonal regular one.

³ Isachsen & Strøm (1981) have a more detailed discussion.

- Reduced probability of detection.

On the demand side increased real income conventionally leads to a change in the composition of demand, away from goods towards services. Services being highly labor intensive and in many cases suitable for unrecorded trading, economic growth *per se* may shift the demand schedule for hidden labor services outwards.

The point we now like to make is an elementary one, which nevertheless seems to have escaped quite a few commentators on the hidden economy, namely that simultaneous outward shifts in demand and supply schedules obviously result in increased *quantity* being traded although not necessarily in increased value. If the supply shift dominates (relative) prices may fall. It is conceivable although not likely that the relative decline in prices will outweigh the relative increase in quantity to make the product, i.e. the value of hidden transactions (in real prices), fall. In such a case *Hidden economic activities* have increased whereas *hidden GDP* as percentage of the measured one has declined.

5.2. Imperfect Information and Pricing Rules

It is in the nature of hidden economic activities that they cannot freely be advertised. Information on demand and supply thus differs among individuals, and prices charged and obtained for similar services vary. "The law of one price" does not hold.⁴ A well known consequence of trading at different prices is loss of efficiency.

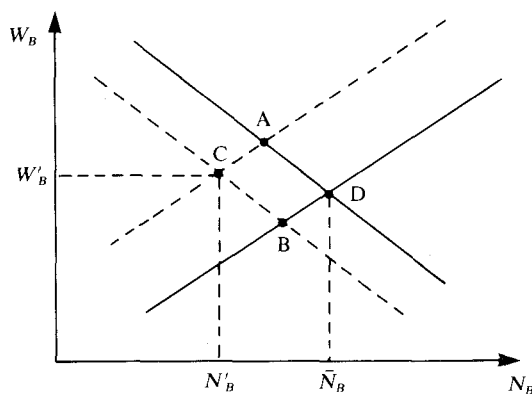


Figure 1. The Hidden Labor Market

Assume now that *not* everyone is familiar with the hidden labor market but those who are have full information. The situation is depicted by a dashed demand and supply schedule in Figure 1. The solid lines indicate supply and

⁴ Whether it holds in the observed sector is a matter of controversy. However, it seems safe to assume that price discrimination is more widespread in the hidden economy.

demand schedules in the case of everybody having full information on the hidden labor market (which, in this case is not hidden anymore but only a vehicle for the risky business of tax evasion). In the dashed lines case trading takes place at uniform prices, at (N'_B, W'_B) . However, lack of information still generates an efficiency loss, in terms of the difference between \bar{N}_B and N'_B .

Now, let more potential buyers become aware of the hidden labor market, whereas the information among suppliers remains unchanged. Wages and hours worked will go up, the equilibrium point will move towards point A in Figure 1. Conversely, if more sellers, i.e. workers, are informed, *ceteris paribus*, the equilibrium point will move towards B.

This diagram illustrates two simple points:

- Suppliers of hidden labor services want their services to be known by potential customers but not by their colleagues. Likewise, buyers will benefit from increased supply at unchanged demand.
- A movement from C towards D is compatible with various paths, depending upon the order in which buyers and sellers enter the market.

Invoking the more reasonable assumption that most people have limited information on the hidden labor market the question we now raise is how prices are determined.

In the extreme case there is just one buyer and one seller, i.e. a bilateral monopoly. From the theory of monopoly we know that the trading point is on the contract curve, but its exact location is indeterminate. The monopoly profit to be exploited consists of taxes evaded, e.g. the value added tax plus marginal income tax of the worker.

In Norway the average marginal income tax is an astonishing 50 percent whereas the value added tax is 20 percent. By present laws the seller should report all income on his annual income declaration whereas the buyer has no duty to ask for a receipt or report the transaction. Thus, in case of detection the seller of hidden labor services is much more likely to suffer than the buyer. It is therefore reasonable that he be compensated for greater risk. One commonly used pricing rule is therefore the following. The seller asks whether VAT should be included or not, thus offering the buyer the opportunity of tax evasion. If accepted, the buyer saves the value added tax (20 percent). The seller, on his part, saves his marginal income tax (on average 50 percent).

Without further probing, it seems reasonable that generally accepted and “fair” pricing rules are established in the hidden labor market, due to information failure and a skewed distribution of risk.

5.3. Productivity

In discussing the productivity of black labor it is useful to distinguish between people who voluntarily switch their supply of labor from the observed sector to the unobserved one, and those who are laid off. Thurow (1980) has observed that although workers within a firm basically are paid the same, the most efficient workers can have a productivity three times their least efficient colleagues. In the unobserved sector the firm usually is quite small—quite often only the individual himself—and payment more likely is according to productivity. Thus, the highly

productive worker has an incentive to redirect his labor supply towards the unobserved sector whereas the less productive one has not.

Concerning the second group, those who are laid off, one would think that they in general are low-productivity workers. However, in modern economies job safety usually increases with duration of employment. Thurow (1980) maintains that job security for established workers is an important prerequisite for their willingness to teach newcomers. Otherwise the older workers would feel threatened by increased productivity of the younger ones, and obstruct the learning process. To avoid such obstruction the firm has to pay a price, i.e. job security increases with seniority. Thus, one would also expect to find many high-productivity workers among laid-off people, although greater variance in productivity than among those who voluntarily switch from the observed to the unobserved labor markets is likely.

However, people whose regular work is difficult to sell in the hidden economy, e.g. a lecture in microeconomics, may have to develop new skills in order to enter the hidden economy. In this period of building up marketable human capital, their productivity and earnings are likely to be modest.

Rather than redirecting one's total hours of work to the unobserved sector, it is more common to work part-time in both sectors. The probability of detection is reduced when part of the income is visible. Further, the buyer of hidden services may feel more assured of the quality of the services rendered knowing that the seller masters his trade in the observed labor market.

6. TAX EVASION OF COUPLES

Among econometricians recently there has been growing interest in the behavior of couples, especially how tax-rates, demographic factors and regulation of the work-day (in ordinary markets) affect female labor supply. Compared to other countries the participation of women in the labor force in Norway is rather low. However, the 1970s experienced a dramatic increase in women's participation in paid labor activities.

In the present model we allow the wife only to work in the hidden economy. The objective function is to maximize the expected utility for a couple. It is assumed that an increase in leisure time for one, *ceteris paribus*, increases the demand for leisure of the other. The husband has fixed hours of work (\bar{L}_M), a given wage rate (W_M) and non-labor income from wealth ($Y_{M,D}$). Thus, his total pre-tax income amounts to

$$(1) \quad Y_M = Y_{M,D} + W_M \cdot \bar{L}_M.$$

However, he has an opportunity of tax evasion through improper filling in of the annual income declaration. The share not reported is denoted h , so that income not taxed becomes

$$(2) \quad X_M = h \cdot Y_M.$$

As far as the wife is concerned she has no capital income and she only works in the hidden sector, where no taxes are paid. She can freely decide on hours of work.

We thus have

$$Y_F = X_F = W_B \cdot L_B$$

where

- Y_F : Wife's income
- X_F : Wife's income not reported
- W_B : Wage rate in black sector
- L_B : Hours worked in black sector.

There is, of course, a variety of other cases that should be considered. This is being done elsewhere. In this section we only report on a special case that perhaps captures real-life behavior for many couples.

With P as the subjective probability of detection, U indicating the utility function, T the tax function and f the expected penalty rate if detected, the maximization problem can now be stated as follows:

$$(3) \quad \max_{h, L_h} [(1 - P) \cdot U(C_n) + P \cdot U(C_d) - G(L_B, \bar{L}_M)]$$

where

$$(4) \quad C_n = Y_M - T(h \cdot Y_M) + W_B \cdot L_B$$

$$(5) \quad C_d = Y_M - T(Y_M) + T(W_B \cdot L_B) - f(hY_M + W_B \cdot L_B).$$

C_n is income (or consumption) if not detected, C_d if detected. In Equation (5) it is assumed that detection of one results in total tax fraud of the couple being revealed, and subjected to the penalty rate f .

Now, in order unambiguously to sign partial derivatives the tax function and the utility function are specified. An additive utility function is assumed, with diminishing absolute risk aversion and constant relative risk aversion. Drawing upon estimations based on Frisch's (1959) complete scheme and on Norwegian data around 1980 (cross-section and time series) this relative risk aversion comes out to be 1.47.

The tax schedule is based on the fitting of a function on the existing tax rules and legal deduction behavior in Norway in 1980. For complete specification five parameters are required,

- increase in a = increased progressivity at every interval.
- increase in e = shortening of tax brackets (i.e. progressivity goes up).
- increase in d_0, d_1 = increase in legal deductions of income to arrive at taxable income.
- increase in b = tax rate on gross income increases.

and the tax function is

$$T(Y) = a(Y - D(Y))^e + bY$$

$$D(Y) = d_0 + d_1 Y$$

With this apparatus at hand we want to analyze how changes in various parameters affect the extent of underreporting by the husband ($X_M = Y_M \cdot h$) and hours of hidden labor activity of the wife (L_B). The question thus becomes to sign the partial derivatives of the arguments in equations (6) and (7).

$$(6) \quad X_M = Y_M h = X_M(Y_M, W_B, \{a, b, d_0, d_1, e\}, P, f)$$

$$(7) \quad L_B = L_B(Y_M, W_B, \{a, b, d_0, d_1, e\}, P, f)$$

Case 1. The income of the husband (Y_M) increases. There are three avenues for such an increase;

- the given work week is extended
- higher wage rate
- increased capital income.

Results

Increased Y_M implies that X_M also increases. With higher income the couple better can afford taking the risk of underreporting.

This effect applies also to the wife, to make her offer more hours of work in the hidden economy. However, there is an effect working in the opposite direction. Leisure being a normal good (due to an additive utility function) she now demands more of it. Being free to decide on hours of work (as opposed to the husband) she reduces her labor supply. In the specified model this effect dominates, making her hidden labor supply decline.

Now, let us consider the case of a decrease in Y_M through a decline in the regular work week (L_M), without any wage compensation, which presently is considered by some politicians as a means of reducing the unemployment rate. In terms of hidden economic activities this model indicates that the husband's underreporting is reduced, i.e. he becomes more honest, whereas the wife works longer hours, i.e. she becomes less honest!

Case 2. For all income brackets the marginal tax rate increases, i.e. an increase in a . Note that an increase in a makes for a decline in the *expected* income of the husband as well as for the wife.

Results

The couple experiences a reduction in expected income. They can less afford to cheat.

As far as the husband is concerned there is a stronger effect working in the other direction; higher marginal taxes make it more profitable to underreport. So he becomes less honest.

In the wife's case the reduction in expected income implies that she less can afford leisure. However, her expected marginal income from work declines. In total effect 1 (less afford to cheat) and effect 3 (expected marginal income from work declines) outweigh effect 2 (less afford leisure) so that her supply of hidden labor declines.

Case 3. Increase in subjective probability of detection (P) or in expected penalty tax rate (f).

Results

The effects here are straightforward; husband as well as wife reduce their hidden economic activities. In our 1980 survey the effect on willingness to evade taxes for both sexes significantly increased with a reduction in the probability of detection. The effect on willingness to cheat of changes in the penalty rate was much less clear. (Isachsen and Strøm 1981, p. 96).

Case 4. Increased wage rate in the hidden labor market (W_B).

Results

The expected income of the couple increases and the husband increases underreporting.

Leisure becomes more expensive for the wife (substitution effect) but she can afford more of it (income effect). The former dominates and she expands her supply of labor.

Higher wage rate in the black market for the female thus induces both to become more dishonest.

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