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BELGIUM

Selected Issues

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Approved by the European I Department

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BELGIUM'S GRAY ECONOMY

I. INTRODUCTION

1. The gray—or underground—economy is here taken to be economic activity of a market nature that is not recorded but that is otherwise legal. It is therefore distinct from non-market activities (such as housework) which are not recorded either. Typically such activities are not declared in order to avoid taxes and social security contributions, or to circumvent costly regulations. However, it should be stressed that tax evasion and underground economic activity are not synonymous: for example, gray activity may be captured by data sources other than tax records. The output of the underground economy is heterogeneous: it includes occasional work, usually catering to households, organized gray work by illegal aliens, and prohibited work by benefit recipients.

2. The gray economy imposes costs along several dimensions. Since unrecorded activity is untaxed, it narrows the tax base. For the same reason, it results in potentially large differences in tax rates across activities, distorting resource allocation. Finally, it undermines the effective implementation of norms, regulations, and collective agreements. Thus, enterprises in the gray economy tend to escape controls on work safety, and noise and pollution standards, and their workers do not benefit fully from labor legislation.

3. Measuring the size of the underground economy is obviously a difficult task. Since, by definition, formal statistics do not exist, researchers have largely fallen back on indirect methods of estimation which are fraught with error. Subject to this reservation, the European Commission (1998) has estimated the size of the gray economy in Belgium to be between 12 percent and 21 percent of recorded GDP. Underground activity of this magnitude is suggestive of a serious problem with important fiscal and social ramifications.

4. Section II reviews the literature, as applied to Belgium and elsewhere, on the determinants of the gray economy. Section III surveys the methods that have been used to measure the size of the grey economy. Section IV updates estimates for Belgium, using the popular currency demand approach.

II. DETERMINANTS OF THE GRAY ECONOMY

5. The major theory of the gray economy focuses on taxes, which drive a wedge between net incomes and gross labor costs (in the case of income taxes, social security contributions, and the like) or between the price paid for work done and the amount the firm keeps (in the case of value-added and profit taxes, for example). The larger are these wedges, the greater is the incentive to operate outside the recorded economy in order to evade the taxes. Thus, there should be a positive link between the tax level and the size of the gray economy (Tanzi, 1998, and KBC, 1999). However, in some countries, such as Greece and Italy, the gray economy is large even though tax pressure is relatively low, while in others, such as the Scandinavian countries, the opposite is true (Figure 1, top panel).

6. A second theory of the gray economy, which is particularly popular in Italy (Contini, 1981, and Bodo, 1983), focuses on a labor market divided into a primary sector, with high human capital and high wages, and a secondary sector, with low skills and wages. The gray economy provides a source of earnings for workers in the second sector, and allows firms to cut labor costs. Bodo (1983) emphasized the role played by regional differentials in unit labor costs in the absence of labor mobility.

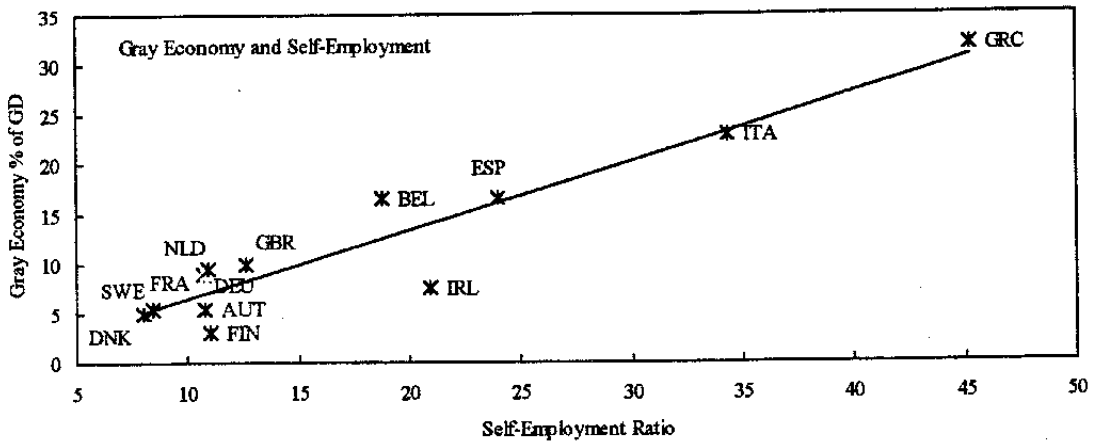
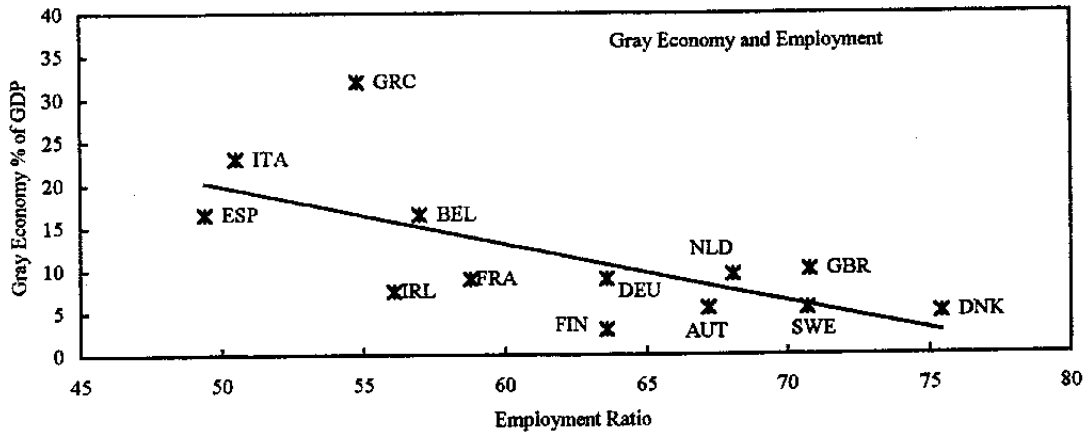
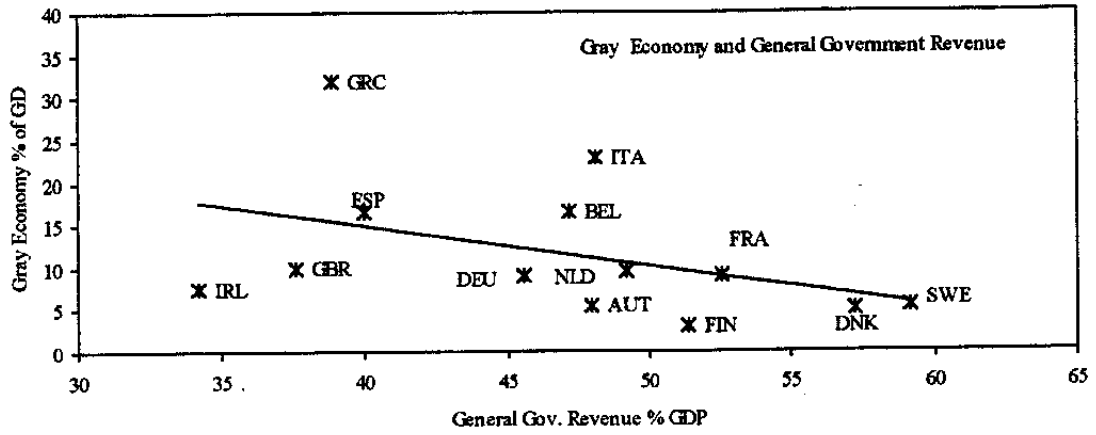
7. Apart from this dual labor market hypothesis, there appears to be a striking relationship between labor-market participation and the estimated size of the gray economy. Across countries, the size of the gray economy is inversely related to the ratio of employment to the employment-age population (Figure 1, middle panel). The underlying economics of this link are not, however, straightforward. On the one hand, since work in the gray economy is not recorded, a large gray economy may mean that many workers do not show up in the employment statistics (though they are, in fact, working).¹ On the other hand, it might also be that high non-wage costs, as well as other labor-market rigidities, depress formal employment and drive workers (and employers) into the underground economy. At the same time, the supply of workers available to the gray economy would be boosted by measures that encourage workers to leave the formal labor market, such as early retirement schemes and benefit schemes that are reduced sharply when someone takes a job (that is, employment traps).

8. Participation in the underground economy has also been linked to the structure of production, and specifically the scale of production. Smaller firms may be more difficult to monitor, and would to that extent be more likely to be found in the underground economy. If economies of scale were not strong, then such small, informal firms would not be at a technological disadvantage relative to larger firms. The striking positive relationship between the size of the gray economy and the fraction of workers who are self-employed illustrates this point (Figure 1, bottom panel). Dallago (1988) stressed the difference between underground activities that can be performed by firms operating in the formal sector, and those requiring the set up of an informal organization.

9. The size of underground economy may also be influenced by the effectiveness of government, since weak or corrupt enforcement of taxation and regulations would provide greater scope for underground activity. According to the World Bank, countries where the

¹ This effect would be limited if most workers in the gray economy also had formal jobs, and so were recorded as employed, or if they were illegal aliens, and therefore not recorded in the working-age population.

Figure 1. Belgium: Determinants of the Gray Economy



Sources: European Union; OECD, Analytical Database; and IMF, WEO.

gray economy is least developed are those where the degree of corruption is the lowest. Important determinants of the size of underground activity thus include the quality of civil servants, the level of public wages, and transparency of rules (Tanzi, 1998). Recent research suggests that greater centralization reduces government effectiveness, as citizens have better control over local than central governments (Fisman and Gatti, 1999).

III. MEASURING THE GRAY ECONOMY

10. Several methods have been developed to estimate the gray economy, each with its weaknesses and strengths. All face the severe challenge of the lack of basic data, and typically compensate by the use of heroic assumptions.

11. This paper focuses on the so-called currency demand approach, which has proved to be the most popular in the literature. This approach assumes that underground transactions are settled in cash and that they are related to aggregate economic variables, typically taxes (Tanzi, 1980 and 1983). It is implemented by estimating a currency demand equation which includes tax variables. The size of the underground economy is then computed by setting the tax rates to zero. Assuming the velocity of money is the same in the gray and recorded sectors, the currency demand so calculated is proportional to the size of the gray economy. The various currency demand approaches reviewed below estimate the underground economy at some 11 percent to 18 percent of recorded GDP, similar to the estimates of the European Commission.

12. Notwithstanding its popularity, this approach suffers from a number of drawbacks. The assumptions that velocity is the same in both the underground and recorded economies (or, alternatively, any necessarily arbitrary assumption regarding velocity in the underground economy) and that the relationship between underground activity and the tax rate is linear all the way down to a zero tax rate are obviously questionable. Moreover, the method cannot reliably distinguish between activity that is unreported but otherwise legal, illegal activity (which is also unreported and presumably uses mainly cash), and tax evasion more generally. Finally, in the case of Belgium, there are the complications of the monetary union with Luxembourg and the fact that the Belgian authorities have already attempted to adjust GDP for underground activity (this latter point would tend to invalidate any approach).

13. Bearing these reservations in mind, researchers have used the currency demand approach to estimate the size of the Belgian gray economy. Mont (1982), regressing the currency-money ratio on a measure of permanent income, the average tax rate, and the unemployment rate over the period 1963 to 1980, concluded that the size of the informal economy ranged from 11.1 percent of recorded GDP in 1966 to 15.2 percent in 1980 (Table 1). Gerrooms (1983) re-calculated Mont's estimates using a partial adjustment model and a marginal permanent tax rate (permanent to capture the idea that the decision to participate in the gray economy is a longer term one). His estimates of the informal sector are

Table 1. Belgium: Indirect Estimates of the Size
of the Underground Economy
(Percent of GDP)

Year	Mont	Gerrooms	Van Hove and Vuchelen 1/	Van Hove and Vuchelen 2/
1966	11.1	-	-	-
1967	11.2	-	-	-
1968	11.3	-	-	-
1969	11.5	-	-	-
1970	11.5	-	-	-
1971	11.9	17.0	-	-
1972	12.0	18.4	17.8	16.0
1973	12.3	19.3	17.2	15.5
1974	12.3	19.4	17.1	15.3
1975	13.2	20.8	18.7	16.8
1976	13.8	20.7	17.7	16.0
1977	14.9	20.8	18.4	16.6
1978	15.4	21.1	18.4	16.6
1979	15.5	20.8	18.4	16.5
1980	15.2	20.4	17.5	15.7
1981	-	20.8	18.0	16.2
1982	-	-	18.4	16.6
1983	-	-	18.4	16.5
1984	-	-	18.2	16.4
1985	-	-	18.2	16.3
1986	-	-	17.5	15.7
1987	-	-	17.2	15.4
1988	-	-	16.0	14.3
1989	-	-	14.8	13.3
1990	-	-	14.5	13.0
1991	-	-	14.1	12.7
1994	-	-	-	-

Sources: Mont (1982), Gerrooms (1993), Van Hove and Vuchelen (1994).

1/ Assumes a velocity of money equal to 3.

2/ Assumes a velocity of money equal to 5 due to money hoarding.

significantly higher than those of Mont. Van Hove and Vuchelen (1994) extended the previous estimates to 1991, making a range of hypotheses regarding the velocity of currency in the underground sector. They concluded that the underground economy peaked in 1982–83 and contracted thereafter.

14. A number of other approaches have also been used to estimate the size of the gray economy. The most recent, and now widely used, is latent variables, an econometric technique that relates unobserved, or latent, variables (the underground economy, in this case) to observable indicators. It requires more data than the currency demand approach, as several indicators are typically employed. The method does not produce estimates or time-series of the gray economy for a given country, but instead only the relative sizes of across countries. Frey and Weck-Hanneman (1984) used tax rates, regulations, tax morality, unemployment, and the level of development, and estimated the size of the gray economy across several OECD countries. The rank of Belgium rose from sixth in 1960 to second in 1978, a result the authors attributed to the more than doubling of direct taxes as a fraction of GDP over that period.

15. The discrepancy approaches infers the size of the underground economy from the discrepancy between income-based and expenditure-based GDP measures. The problem is to distinguish discrepancies due to the gray economy and from those due to other factors, such as measurement error. A similar method compares actual tax receipts with expected receipts based on income data from the national accounts. Using this method, Frank (1998) estimated that tax evasion ranged between 5 percent and 7½ percent of Belgian GDP in 1997.

16. Other methods use a reference period and an indicator to infer the size of the underground economy. Approaches based on participation rates attribute the differences between formal participation rates and a “normal” rate, presumed constant and relative to a reference period, to the gray economy. Physical input approaches assume output in the underground economy are related to the use of particular inputs, typically electricity, and apply constant input coefficients relative to a reference period. In such cases, there are difficulties attributing differences in the observed variable to changes in the gray economy, and with choosing the reference period.

17. Finally, “direct” methods attempt to create the missing data using formal audits, censuses, surveys, or sample interviews, the results of which are then extrapolated to the entire economy. It is not always obvious how the data thus obtained relates to underground activity, nor whether the extrapolation of sometimes very limited samples is reliable. For example, Smith (1987) and Dilnot and Morris (1982) have used this method for the United States and the United Kingdom, respectively. For Belgium, Pestieau (1985) interviewed a sample of 330 people in Liege in the Spring of 1983 on supply and demand of informal labor. Nearly half admitted receiving income from gray work in the previous year, and 36 percent declared they had used the services of gray labor.

IV. CURRENCY-DEMAND ESTIMATES OF THE GRAY ECONOMY

18. Estimates of the size of the underground economy in Belgium presented in this section update earlier estimates. In addition, they address directly the apparent non-stationarity of the regressors and attempt to distinguish between the effects of indirect and direct taxation (as has been done, for example, for the case of Austria by Schneider, 1994). These estimates are made with the currency demand approach, and therefore suffer from the drawbacks described above.

19. The key relation to be estimated is the demand for currency, expressed as a ratio of total money (CM):

$$\ln CM = \ln A + a \ln Y + b \ln R + c \ln \pi + d \ln P + \alpha \ln t + \beta \ln \tau + \omega,$$

where A the constant term, Y is real GDP, R is the interest rate on demand deposits, π is the rate of inflation, P is the proportion of the population living in urban areas, t is the effective rate of direct taxes (excluding social security contributions), τ is the effective VAT rate and ω is the error term.

20. The choice of regressors is motivated as follows. As in standard money demand functions, the interest and inflation rates represent the opportunity cost of holding cash. Other studies, such as Pahl (1987), have found that the demand for underground services is positively related to income. The degree of urbanization captures the greater ease of using non-cash payment in urban areas. The two tax rates capture the need for cash in the underground economy; that is, it is assumed that gray activity is motivated principally by a desire to avoid taxation.² Two tax rates are used in an attempt to estimate the effect of the tax mix on underground activity.

21. Non-nested tests support the logarithmic form over the alternative linear form. Other tax variables (such as social security taxes) were tried but rejected on the basis of non-nested tests.³ The tax variables have been lagged one period, to reflect that citizens base their decisions on their past experience of tax levels rather than on current tax policy announcements; empirical evidence supports this specification.

22. Empirical tests also imply that the variables are non-stationary but cointegrated, implying an error-correction model is appropriate. First, a so-called "spurious regression"

² The currency demand function will distinguish between tax avoidance and underground activity to the extent that the former (overstating deductions on taxable income derived from otherwise recorded activity, for example) does not result in extra use of cash.

³ The tax variables have been calculated as $\ln(T+1)$ (Tanzi, 1980). The money series used here has an obvious break in 1992, which has been removed with a dummy variable.

was estimated by ordinary least squares on the levels of the regressors, in order to derive the cointegration vector. The elements of this vector are the long-term parameters of the demand equation and describe the underlying relation between the variables. Then, the first differences of the dependent variable were regressed on the first differences of the regressors and the error-correction term (the residuals of the spurious regression lagged by one period).

23. Finally, following Tanzi (1980) and Mont (1982), the size of the underground economy is computed by setting the tax rates to zero in the regression. As the underground economy is assumed to have disappeared when taxes are zero, and it is assumed that that sector used only cash, the resulting currency-money ratio, denoted CMF, is the ratio of currency used in the recorded sector to total money. And the difference between CM and CMF is the currency used in the underground economy, as a ratio to total money. Applying the elasticity of income of cash demand, assumed to be the same for both the recorded and gray economies, yields an estimate of the size of the latter.

24. The regression results are presented in Table 2. The implied estimates of the size of the underground economy, shown in Figure 2, suggest that the underground economy peaked at nearly one-third of the recorded economy in 1980, and has since declined to about 13 percent. This evolution accords broadly with the results of Van Hove and Vuchelen (1994), which are based on similar assumptions (but assume a linear demand function), although they found that the peak was a couple of years later and a higher proportion of GDP.

25. One intriguing feature of the regression results is that the direct tax coefficient is much smaller than the indirect-tax coefficient. This result implies that a switch from indirect to direct taxes, while maintaining overall tax revenues, would tend to lower the size of the underground economy. Following the logic of the theory behind the regression equation, such an effect might arise because, relative to direct taxes, indirect taxes are more burdensome, or are easier to evade, or are structured such that evasion requires more cash. The truth of these propositions is not immediately evident. However, given the potential gains from restructuring the tax system, the effects of the tax mix on underground activity deserve further examination.

Table 2. Belgium: Estimated Coefficients of the Currency-Demand Equation

Variable	Spurious Regression	Error Correction Model 3/	Complete Model 4/	
			Current Values	Lagged Values
Constant	-7.8964	-0.0210	-12.19089	...
Currency-money ratio	-0.5412
Real GDP	0.6022	0.3232	0.3232	0.6049
Inflation	-0.0160	-0.0178	-0.0178	-0.0069
Interest rate on deposits	0.0757	0.0937	0.0937	0.023
Degree of urbanization	-31.7775	-7.1843	-71843	-41.7912
Direct taxes 1/	1.2405	1.219	1.219	0.6929
VAT 1/	5.2168	3.398	3.398	4.6421
DUMMY	-0.2885	-0.2701	-0.2701	0.1745
Error-correction term 2/	...	-1.5412

Source: Fund staff estimates.

1/ Lagged one period.

2/ Lagged residuals from the spurious regression.

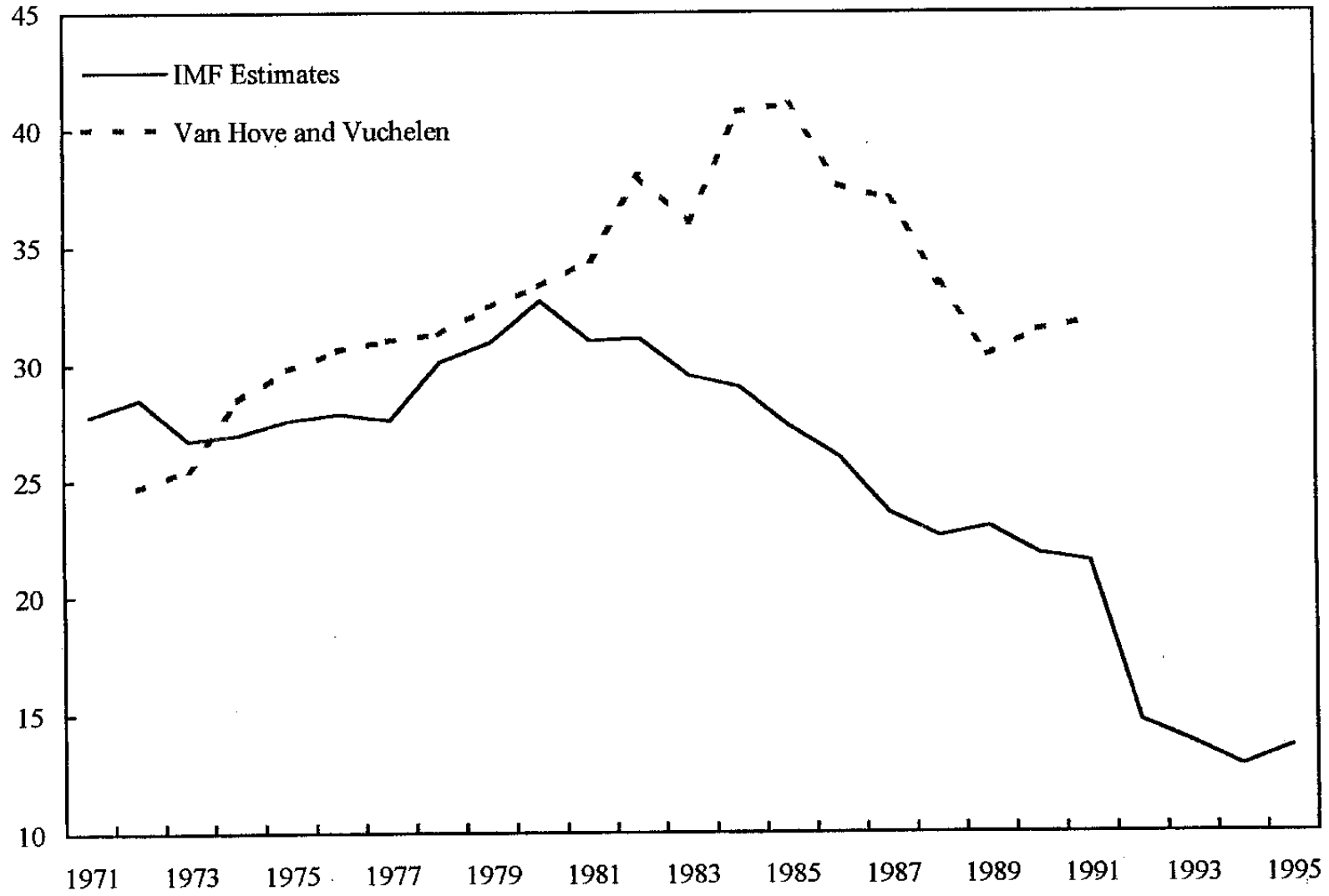
3/ All variables are in first differences apart from the constant and the error-correction term.

4/ The model describing the short-term dynamics includes both current and lagged values of all dependent variables, and a lagged value of the dependent variable.

Notes: All variables are in logs.

The sample period is 1970-1995.

Figure 2. Belgium: Size of the Gray Economy
(In percent of GDP)



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