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Tax reform and the Dutch labor market in the 21st century

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Abstract

The tax reform proposals by the Dutch government include several shifts in the tax structure and a cut in the overall tax burden. This paper argues that these reform proposals reduce the unemployment rate only if the gap between wage incomes and unemployment benefits increases and the overall tax burden drops. Targeting the tax reduction to the unskilled seems the most effective way to cut unemployment. However, such targeted measures raise the marginal tax on other incomes, thereby harming the quantity and quality of labor supply.

Samenvatting

De kabinetsvoorstellen in de nota "Belastingen in de 21e eeuw" verminderen alleen de werkloosheid indien de belastingdruk daalt en het inkomensverschil tussen loon en uitkering wordt vergroot. Het richten van de belastingverlaging op werkenden aan de onderkant van de arbeidsmarkt blijkt daarbij het meest effectief in het bestrijden van de werkloosheid. Dit gaat echter gepaard met een verhoging van de marginale druk op de middeninkomens hetgeen ongunstig uitpakt voor de kwantiteit en de kwalilteit van het arbeidsaanbod.

The Dutch government recently published a white paper "Taxes in the 21st century" on the future of the Dutch tax system. The tax-reform proposals in this white paper address the challenges the Dutch tax system is likely to face in the next century. The document suggests reforms of several taxes, including capital, income, consumption and environmental taxes. The article by Bovenberg and Ter Rele in this issue of *CPB Report* explores the proposed reforms of capital taxation. The present paper investigates the labor-market implications of the proposed changes in income taxes and the shift from direct towards indirect taxes. We adopt CPB's applied general equilibrium model, called MIMIC. This model is specifically designed for analyzing tax policies in the Netherlands by focusing on adequately describing wage formation, labor demand and supply, and the institutional details of the Dutch tax sys-

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MIMIC is an applied general equilibrium model for the Netherlands that is designed to analyze the longrun economic impact of tax policies. It contains five submodels that are linked through markets. The submodels include:

1. Model of the firm
Firm behavior in six production sectors is derived from profit maximization on a market characterized by monopolistic competition. This submodel determines the demand for three types of labor, namely unskilled, low-skilled and high-skilled labor.

2. Household model
MIMIC contains 40 types of households that differ in skill level, composition and labor-market status. This submodel derives labor supply of each household by maximizing utility subject to a budget constraint and a time constraint.

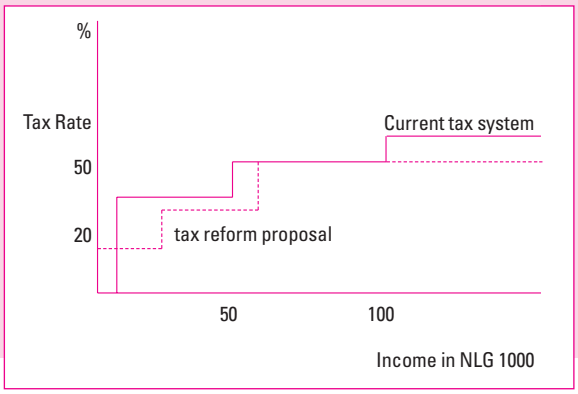
3. Wage formation
The labor market is characterized by equilibrium unemployment due to imperfections. In particular, a right-to-manage model describes the process of wage formation. The average tax burden and the replacement rate have a positive impact on the wage outcome, whereas the marginal tax and labor supply reduce wages. The producer wage depends on not only this contractual wage, but also on search costs related to the matching proces.

4. Matching model
The matching model describes the contacts between vacancies and unemployment for each skill type. Part of these contacts result in a mismatch because a minimum wage and a reservation wage distort the matching proces. The vacancy/matching-ratio raises the producer wage through its effect on search costs.

5. Government sector
Government behavior is largely exogenous. This submodel describes Dutch labor-market institutions, the statutory tax and premium system, and the system of social insurances.

Apart from these main building blocks, MIMIC contains an informal sector that consists of household production and a black labor market. Furthermore, endogenous training decisions that contribute to human capital formation and a market for childcare are included.

Figure 1 The current Dutch income tax system and the tax reform proposal



tem (see box 1). Indeed, MIMIC combines a rich theoretical framework based on modern economic theories, a firm empirical foundation, and an elaborate description of the Dutch tax system. The theoretical foundation of the model implies that one can interpret the model results rather easily in terms of rational micro-economic behavior (for a description of the model, see Gelauff and Graafland (1994); Graafland and De Mooij (1998); or Bovenberg, Graafland and De Mooij (1998)).

This paper is organized as follows. After giving a short overview of the current Dutch tax system, we discuss the implications of three budgetary neutral tax reforms included in the government white paper. Subsequently, we elaborate on some of the tax-reform proposals in the white paper that reduce the tax burden.

The current Dutch tax system

The statutory income tax system in the Netherlands in 1998 is pictured in figure 1. It consists of a general tax allowance of about DFL 8.600 and three tax brackets. The tax rate in the first bracket in 1998 is 36.35%. The rate in the second bracket is 50% and has to be paid on incomes above DFL 55.000. The marginal rate in the third tax bracket is 60% and is paid on incomes above DFL 115.000. For workers, a special earned-income tax deduction amounts to 12% of current labor income with a maximum of around DFL 3.100. This maximum is reached at an annual income of DFL 26.000. Furthermore, there are a number of tax allowances such as a tax deduction for interest payments on (mortage) loans, pension premiums, and a number other special expenditure categories. VAT in the Netherlands consists of a low rate on necessary goods (6% rate) and a high rate on other goods (17½%).

Three revenue-neutral tax reforms

The government proposals for tax-reform include three types of revenue-neutral shifts in the tax burden. The first amounts to abolishing some specific tax deductions to reduce income tax rates. The second experiment involves a shift in the tax burden from direct towards indirect taxes. The final tax shift eliminates the general tax allowance accompanied by a reduction in income tax rates. The long-run effects of these three experiments on the labor market according to MIMIC are presented in the first three columns of table 1.

Abolishing tax deductions and reducing tax rates
The first element of the tax-reform proposal involves a

broadening of the tax base by reducing a number of tax deductions such as interest payments on short-term loans

Table 1 Long-run effects of three revenue-neutral tax reforms, according to MIMIC

	(1)	(2)	(3)
	relative changes in %		
Producer	– 0.1	– 0.5	– 0.8
Production	0.3	0.1	0.4
Employment	0.3	0.1	0.5
Participation rate	0.1	– 0.1	– 0.5
Labor supply (hours)	0.2	0.0	0.5
Black labor supply	– 0.4	0.1	– 0.5
Human capital (index)	0.0	0.0	0.0
	absolute changes in %		
Unemployment rate	0.0	0.0	0.1
Average replacement ratio	– 0.2	0.2	– 0.3
Average tax burden[a]	– 0.2	0.2	– 0.3
Marginal tax burden[a]	– 0.7	– 0.9	– 1.2
Public consumption[b]	0.0	0.0	0.0

a Weighted average of micro burdens on workers, excluding indirect taxes
b Closure rule, in terms of GDP

Simulations:
(1) Abolishing a set of specific tax deductions and cutting income fax rates
(2) A shift from direct to indirect taxes
(3) Abolishing the general tax deduction and cutting income tax rates

and some particular annuity and saving facilities. The most important tax allowances, however, such as the tax deductions for interest payments on mortage loans, pension premiums and worker allowances, are not affected. Therefore, the broadening of the tax base yields revenues of only 0.35% of GDP. These revenues are used to reduce the rates in the first three tax brackets by, respectively, 0.65%-point, 1.6%-point and 1.8%-point. For most income categories, this revenue-recycling implies that the operation exerts, on average, no impact on after-tax real incomes (although there may be substantial effects in particular individual cases).

The first column of Table 1 reveals that this part of the reform reduces the marginal tax burden as perceived by households. The lower marginal rates stimulate labor supply through the substitution effect. Through the process of wage formation, this additional labor supply moderates wage claims by unions so that employment slightly expands. Unemployment does not change much, however.[1]

A shift from direct to indirect taxes

The second revenue-neutral element in the tax-reform proposals involves replacing direct by indirect taxes. In particular, the VAT rate is increased from 17½% to 19%. Furthermore, energy taxes and taxes on other pollutants are raised. The additional revenues from these indirect taxes amount to 1% of GDP. In order to ensure that most households do not experience losses in real disposable incomes, these revenues are recycled to the private sector through a reduction in the rate of the first tax bracket of 1.6%-point and an increase in the basic tax deduction of DFL 800. The second column of Table 1 shows that this component of the proposed tax reform hardly affects employment and unemployment. The reason is that households are not encouraged to supply more labor since the incidence of the lower direct taxes bears on similar incomes as the incidence of the higher indirect taxes. Indeed, the shift from direct to indirect taxes is designed so as to keep the income distribution among the various income categories broadly unaffected. The restrictions of budgetary and income neutrality imply that the consequences for the labor market are negligible.

Abolishing the basic tax allowance

A third revenue-neutral tax shift included in the white paper involves abolishing the basic tax allowance. Furthermore, the borders of the second and third brackets are reduced to DFL 26.500 and DFL 53.000, respectively. These changes allow the government to substantially reduce the income tax rates in the three tax brackets to, respectively 20,35%; 35% and 50%. In terms of figure 1, this proposal implies that different borders of the tax brackets move to the left while marginal tax rates drop (see the dashed lines in figure 1). Accordingly, individuals with annual incomes below the current basic tax allowance are faced with a higher marginal tax rate, while the marginal tax rate for households with somewhat higher incomes falls. Furthermore, whereas the marginal tax rate for middle incomes remains broadly unaffected, the lower tax rate in the third bracket reduces the marginal tax rate for high-income households.[2] The effects on the labor market are presented in the third column of Table 1.

Labor supply in hours rises through two main channels. First, the lower marginal tax rate on high incomes stimulates labor supply through the substitution effect. Second, whereas the higher marginal tax burden on low incomes discourages participation in very small part-time jobs (i.e. the participation rate falls), the lower marginal tax rate in the first bracket stimulates part-time workers to increase their hours worked. On balance, labor supply in hours rises by 0.5%. Unemployment rises marginally because the value of existing in-work benefits is reduced. Indeed, for low-income groups the earned-income tax allowance is no longer deducted at a 36.35% rate, but only at the 20.35% rate. This raises the replacement rate for low-income groups, thereby exerting upward wage pressure through a rise in the outside option for employees in the wage negotiations. Furthermore, the higher replacement rate exacerbates the mismatch on the labor

Table 2 Long-run effects of four types of tax cuts according to MIMIC.

	(1)	(2)	(3)	(4)
	relative changes in %			
Wage	– 0.2	– 0.4	– 0.5	– 0.7
Production	0.5	0.8	0.3	0.6
Employment	0.4	0.6	0.5	0,9
- unskilled[a]	0.5	1.1	1.7	2.7
Participation rate	0.1	0.1	1.1	0.1
Labor supply (hours)	0.2	0.1	– 0.2	0.0
Black labor supply	– 0.3	0.1	0.6	1.4
Human capital (index)	0.1	0.1	– 0.1	– 0.2
	absolute changes in %			
Unemployment rate	– 0.2	– 0.4	– 0.5	– 0.6
- unskilled[a]	– 0.2	– 0.6	– 0.9	– 1.2
Average replacement ratio	– 0.1	– 0.5	– 0.4	– 0.9
Average tax burden[b]	– 0.4	– 0.7	– 0.7	– 0.6
Marginal tax burden[b]	– 0.6	– 0.2	0.8	1.2
Public consumption[c]	– 0.2	– 0.2	– 0.2	– 0.1

[a] Unskilled workers with an income up to 120% of the minimun wage
[b] Marginal tax on hourly wage as a weighted average of micro burdens on workers
[c] Closure rule, in terms of GDP. The ex-ante reduction in tax revenues if normalized at 0.35% of GDP

Simulations:
(1) Lower marginal tax rates in all tree brackets
(2) Introduction of a flat earned-income tax credit
(3) Introduction of a targeted earned-income tax credit, based on annual incomes
(4) Introduction of a targeted earned-income tax credit, based on hourly wages

market by raising the reservation wage of the unemployed who become more reluctant to accept a job offer.

Cutting the tax burden

The results from Table 1 suggest that tax shifting without reducing the overall tax burden has only minor implications for the labor market. The reason is that the three revenue-neutral tax-reform proposals do not allow for changes in the income distribution among various income groups. Such diverging income effects may be acceptable, however, if the government is able to reduce the overall tax burden. Indeed, this would allow the government to protect the incomes of the unemployed and those outside the labor market and yet reducing the tax burden on workers. The policy document discusses 18 different ways to reduce the overall tax burden and explores which of these ways is most effective in reducing the unemployment rate and raising labor supply. Below, we highlight the most important instruments that are incorporated in these 18 variants. In each experiment, the ex-ante (i.e. before behavioral responses have been taken into account) reduction in tax revenues is 0.35% of GDP (2.5 billion guilders). A cut in public consumption is necessary to balance the government budget ex post, i.e. after the effects of the behavioral responses on the public budget have been taken into account. Hence, the required cut in public consumption reflects the impact of behavioral responses on the public budget. In particular, if the reduction in public consumption is less than the ex-ante cut in revenues of 0.35% of GDP, behavioral responses help to mitigate the budgetary costs.

Cutting marginal tax rates

The first column of Table 2 contains the effects of a cut in all three tax brackets of the Dutch personal income tax. In particular, the tax rate in each bracket is cut by 0.7%-point. This tax cut reduces both marginal and average tax rates. Since substitution effects from leisure to consumption dominate income effects, the reduction in the marginal tax rates boosts aggregate labor supply (in hours). This effect is reinforced by the decline in the supply of black labor because lower marginal income taxes make formal labor supply more attractive compared to informal labor.

The income tax cut reduces equilibrium unemployment for two main reasons. First, the drop in the average tax burden moderates contractual wages. Second, the replacement rate falls. Indeed, workers tend to benefit more from lower marginal rates of personal income tax than transfer recipients do because the incomes of workers tend to exceed those of transfer recipients.

Overall, we find that reducing marginal tax rates raises aggregate employment through the channels of both lower unemployment and higher labor supply.

Flat earned income tax credit

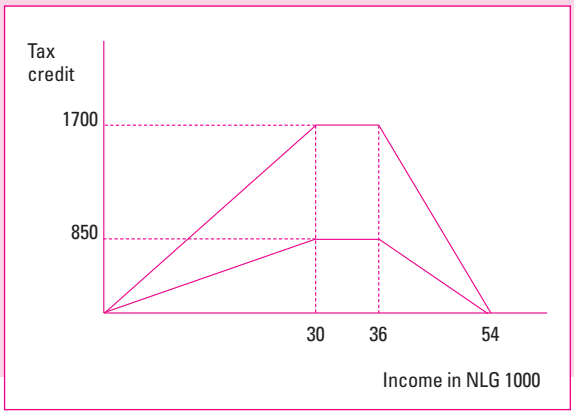
The second column of Table 2 contains the impact of a flat EITC of 350 guilders per year (corresponding to about 0.7% of the median gross wage). This non-refundable EITC reduces the marginal tax rate on small part-time jobs so that partners find it more attractive to enter the labor force. Accordingly, the participation rate (i.e. labor supply in persons) increases. The income effect reduces labor supply of other groups, thereby offsetting higher labor supply of partners. On balance, aggregate labor supply (in hours) rises slightly.

Unemployment declines substantially. The reason is that the EITC accrues only to those in work and hence reduces the replacement rate. The lower replacement rate enhances job matching by reducing the reservation wage. Moreover, it moderates contractual wages. This wage moderation reduces the incomes from transfers recipients because social benefits are linked to gross wages.

A targeted EITC based on annual labor incomes[3]

The third column of Table 2 explores the impact of an EITC that focuses on raising the reward to low-skilled work. The EITC analyzed here depends on annual labor income of an individual.[4] It amounts to 4 % of annual labor income of the individual in a phase-in range up to the statutory minimum wage (DFL 30.000) and stays at DFL 850 in a flat

Figure 2 Structure of the earned income tax credit



range up to incomes of about DFL 36.000 (120% of the minimum wage), see figure 2. Subsequently, the EITC is phased out linearly between annual labor incomes of DFL 36.000 and DFL 54.000 (i.e. 180 % of the minimum wage).

The EITC reduces the marginal tax burden on small part-time jobs, thereby encouraging partners to join the labor force. Accordingly, the participation rate increases. Moreover, partners raise their labor supply (in hours) because many partners fall in the phase-in range of the EITC. Breadwinners and singles, in contrast, reduce their labor supply because of a positive income effect and, to the extent that they fall in the phase-out range, a negative substitution effect associated with a higher marginal tax rate. On balance, the reduction in labor supply on account of the substitution effect in the phase-out range and the income effect dominates the positive effect on the participation rate. Hence, aggregate labor supply (in hours) drops. The high marginal tax rate in the phase-out range reduces also the incentives for training. Indeed, the human capital index falls. Furthermore, the higher marginal tax rate in the phase-out range boosts informal activities.

Compared to the fixed EITC, the targeted EITC is more effective in reducing the replacement rate for low-paid work. Low-paid workers suffer disproportionally from unemployment. Accordingly, targeting the EITC is rather effective in stimulating the unemployed to search more intensely for a job and to reduce their reservation wage, thereby facilitating job matching. Furthermore, the lower replacement rate weakens the bargaining position of the unions in collective bargaining. Hence, contractual wages fall. Through all these channels, unemployment declines. Unemployment for the unskilled falls by 0.9 percentage points, which compares to a drop of 0.6 percentage points with a flat EITC.

The comparison between the flat and targeted EITC reveals a trade-off between, on the one hand, raising labor supply and, on the other hand, fighting unemployment. In particular, by widening the income gap between low labor incomes and social benefits, a targeted EITC is more effective in fighting unemployment. However, by reducing the income gap between low and high labor incomes, this EITC yields lower labor supply than a flat EITC does.

A targeted EITC based on hourly wages

The targeted EITC explored above accrues also to part-time workers with high hourly wages but low annual incomes. If the objective is to reduce the number of unskilled who collect unemployment benefits, the EITC is not well targeted. Therefore, the white paper focuses on a targeted EITC that depends on hourly wages rather than annual incomes. Workers who earn the hourly minimum wage and hold a full-time job are eligible for the full EITC. The credit is reduced proportionally for workers who work less than a full-time job. It gradually drops also with the level of the hourly wage rate.

By reducing the credit for part-time workers, the EITC for full-time workers who earn an hourly wage up to 120% of the statutory minimum wage can be doubled to DFL 1700. The phase out range runs up to an hourly wage of 180% of the minimum wage. The labor-market effects are presented in the fourth column of Table 2. We find that this EITC reduces the marginal tax burden only on part-time jobs with low hourly wages. Hence, the effect on the participation rate is smaller than in the previous experiment. The higher marginal tax rate in the phase-out range applies only to higher hourly wages and not to higher labor incomes on account of more hours worked. Accordingly, labor supply (in hours) drops only on account of the income effect. Both the effects on participation and labor supply (in hours) are thus smaller (in absolute value) than in the previous experiment. Indeed, on balance, the positive effect on participation rate and the negative labor supply effect associated with the income effect cancel out. Consequently, labor supply (in hours) is unaffected.

The marginal tax rate on higher hourly wages in the phase-out range is higher than in the previous experiment because the maximum credit is twice as large. This harms the incentives to accumulate human capital. Hence, compared to an EITC that depends on annual incomes, an EITC that depends on hourly wages does less harm to the quantity of labor supply but more harm to its quality. Another drawback of this variant of the EITC is that it relies on additional information (namely the number of hours worked in the formal sector) that is vulnerable to fraud. Indeed, the black economy expands substantially.

This EITC reduces the replacement rate for unskilled workers more substantially than the other EITCs explored above. Through skill-specific wage formation, this decline in the replacement rate for unskilled work reduces gross unskilled wages, thereby boosting demand for unskilled labor. Moreover, the lower replacement rate stimulates search and lowers the reservation wage, thereby facilitating the matching process for unskilled labor. Accordingly, the unemployment rate for the unskilled and the low skilled drops more substantially than under the EITCs analyzed above.

Conclusions

The recent white paper by the Dutch government on the future of the Dutch tax system aims at cutting unemployment in general and low-skilled unemployment in particular, stimulating the quantity and quality of labor supply and maintaining an equitable income distribution, including a reasonable income level for those dependent on social benefits. Simulations with MIMIC reveal trade-offs between these objectives. Indeed, these objectives imply different priorities for how tax cuts are structured. In particular, cutting unemployment primarily requires widening the gap between labor incomes and transfer incomes in unemployment. Raising the quantity and quality of labor supply in the formal economy calls for widening the income differentials between low formal labor incomes and high formal labor incomes. Measures aimed at cutting unemployment and raising employment may thus conflict with the objective to maintain an equitable income distribution.

An effective way to fight economy-wide unemployment are in-work benefits. These benefits widen the gap between after-tax income from work and net transfer income, thereby raising the reward to work compared to relying on social benefits. This moderates wage costs, reduces reservation wages, and encourages search of jobseekers. The wage moderation reduces social benefits because these benefits are indexed to (gross) wages.

Targeting in-work benefits on the low skilled is the most effective way to cut economy-wide unemployment. This is because the gap between labor income and transfer income is smallest for low-skilled workers. Hence, widening this small gap produces the largest pay-off in terms of reducing unemployment. However, by reducing the gap between low en high labor incomes through a more progressive tax system for workers, a targeted EITC reduces the hours of labor supplied. This trade-off between cutting unemployment and raising labor supply (in hours) can be mitigated by linking the EITC to hourly wages rather than annual incomes and by reducing the EITC proportionally for small part-time jobs. Doing so, however, raises the marginal tax burden on hourly wage increases, thereby discouraging the accumulation of human capital and stimulating the black economy. Moreover, the lower benefits to small part-time jobs do not help to raise the labor-force participation of women. This points to a trade-off between targeting tax cuts at small part-time jobs of partners or at full-time jobs of breadwinners and singles earning low hourly wages.

Tax cuts in the higher tax brackets are most effective in raising the quantity and quality of formal labor supply (in hours). Indeed, these policies widen the after-tax income differentials between low and high labor incomes by reducing marginal tax rates. However, cuts in higher tax brackets are less effective in reducing unemployment (by widening the income gap between being in work and collecting unemployment benefits), raising low-skilled employment, and stimulating labor supply.

References

Bovenberg, A.L., J.J. Graafland and R.A. de Mooij, 1998, Tax reform and the Dutch labor market: an applied general equilibrium approach, Paper presented at the TAPES conference, Copenhagen, May 21-23.

Gelauff, G.M.M., and J.J. Graafland, 1994, *Modelling Welfare State Reform*, North Holland.

Graafland, J.J, and R.A. de Mooij, 1998, Analyzing fiscal policy in the Netherlands: Simulations with a revised MIMIC, CPB Research Memorandum no. 140, The Hague.

Notes

[1] In interpreting the results, one should note that individuals in MIMIC assume that tax deductions remain constant if income rises. Hence, tax deductions do not reduce the perceived marginal tax rates. If households would perceive a higher marginal tax rate if tax deductions, which tend to rise with income, are abolished, labor supply would not rise.

[2] Couples with a non-participating partner maintain a single tax deduction of DFL 9.500. This aims tax deduction at protecting the after-tax incomes of these couples.

[3] The white paper does not contain a proposal for an EITC based on annual incomes. However, some of the, sometimes complicated, variants are similar to such an EITC.

[4] Hence, this EITC differs from the EITC implemented in the US, which depends on family income and the number of children in a family.