
DE ECONOMIST 148, NO. 1, 2000

AN EARNED INCOME TAX CREDIT IN THE NETHERLANDS:
SIMULATIONS WITH THE MIMIC MODEL

BY

FLOOR M. VAN OERS, RUUD A. DE MOOIJ, JOHAN J. GRAAFLAND, AND J. BOONE*

Summary

In recent policy discussions in the Netherlands, the Earned Income Tax Credit (EITC) has been put forward as an instrument to reduce the unemployment rate among low-skilled workers. Using MIMIC, CPB's applied general equilibrium model for the Netherlands, this article discusses the economic impact of different forms of the EITC. The analysis reveals that moderately targeting the EITC to the unskilled makes the instrument more effective in reducing unemployment. The targeting concept features decreasing returns, however. Indeed, it may be counterproductive if the EITC is targeted at a very small income range. Furthermore, targeting the EITC to the low skilled induces adverse effects on the quality and quantity of labour supply because it raises the marginal tax burden on medium-income workers.

Key words: earned income tax credit; applied general equilibrium; unemployment

1 INTRODUCTION

The Netherlands suffer from a relatively high structural unemployment rate among low skilled workers. In 1996, the unemployment rate among the low skilled was more than twice the unemployment rate of skilled workers. One explanation for this phenomenon is thought to be the poor labour market incentives for the low skilled unemployed. Indeed, the replacement rate at the bottom of the labour market, defined as the net social benefit in terms of the net wage rate, is rather high in the Netherlands. This depresses the motivation for the low-skilled to search for work and makes them reluctant to accept a job. Therefore, recent tax proposals have focused on reducing the replacement rate among the low skilled through the introduction of a so-called Earned Income Tax Credit (EITC). The white paper on taxes in the 21st century in the Netherlands contains a proposal for an EITC (Parliament (1997)).

The EITC has already been used in the United States for over 20 years. The experience with the EITC in the US may yield important lessons for the discussion about the EITC in the Netherlands. Therefore, this paper starts by providing an overview of the literature on the EITC in the US. In the US, the EITC aims

* CPB Netherlands Bureau for Economic Policy Analysis, P.O. Box 80510, 2508 GM The Hague, The Netherlands; e-mail: radm@cpb.nl

at reducing poverty among low-income workers, without adversely affecting the incentives for labour supply. In contrast, the proposals for an EITC in the Netherlands primarily aim at reducing the unemployment rate at the bottom of the labour market. Therefore, the design of the EITC that has been proposed in the Netherlands differs from the one that exists in the US. This paper adopts the CPB's applied general equilibrium model for the Netherlands, MIMIC, to investigate the labour market effects of different forms of EITC.¹

2 THE EITC IN THE US: A SURVEY OF THE LITERATURE

The Earned Income Tax Credit (EITC) was first introduced in the United States in 1975. It is a credit on the federal income tax,² designed to help poor working families. The credit started out as a small program aimed at offsetting the social payroll tax for poor working families with children. In 1986, 1990 and 1993 there have been major expansions of the program, making it one of the major instruments for anti-poverty policy in the United States. The 1993 expansion was initiated by President Clinton, who stated in his first State of the Union:

'The new direction I propose will make this solemn, simple commitment: by expanding the refundable earned income tax credit, we will make history; we will reward the work of millions of working poor Americans by realizing the principle that if you work 40 hours a week and you've got a child in the house, you will no longer be in poverty' (Shapiro and Greenstein (1993))

After the expansion of the program in 1993, a worker with 2 children working 40 hours per week at the minimum wage level was taken out of poverty.³ By now, the EITC is the largest cash program directed at low-income households.⁴

2.1 Design of the American EITC

To be eligible for the EITC, a family must meet three requirements. First, there must be positive earned income. Indeed, the EITC is a credit directed only at people who work; income from other sources than work is discounted from the

1 The UK is also discussing the possibility of an EITC based on the US model. The current Family Credit System in the UK shows a number of similarities to the American EITC, see e.g. Walker and Wiseman (1997).

2 Some states offer a supplement to the EITC at state level, but we restrict our attention to the federal level.

3 The poverty line in 1994 was about \$ 15,000.

4 Yin et al. (1994) estimate the cost of the EITC at \$24.5 billion for 1998. To compare, the Aid to Families with Dependent Children program (AFDC) costs about \$16 billion.

income used to calculate the EITC.⁵ Second, the earned income of a family should be smaller than a certain threshold. In 1996, the maximum income for a family with 2 children was \$28,495. Third, the family should care for a child younger than 19, a child younger than 24 who is a full time student, or a child who is disabled regardless of age. Since 1994, there is a small credit for workers without children.

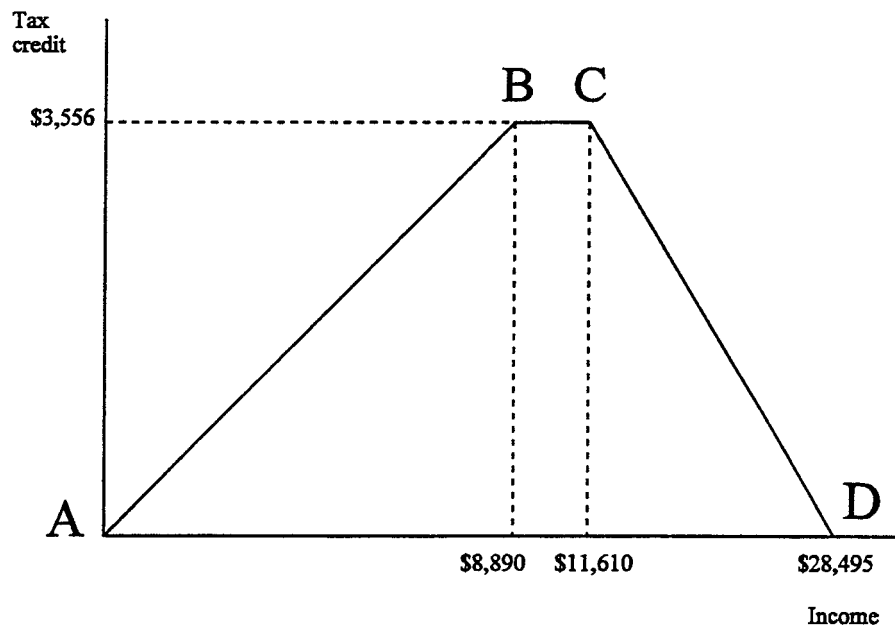


Figure 2.1 – The earned income tax credit in the US (household with two children in 1996)

The EITC contains three ranges. Figure 2.1 illustrates the credit in these ranges for a household with two children in relation to its total family income for 1996. First, in the phase-in range, represented by AB in Figure 2.1, people receive a credit of 40% of their earned income. In 1996, the phase-in range runs up to a maximum income of \$8,890. The line BC in Figure 2.1 represents the so-called flat range. In particular, households with an annual earned income between \$8,890 and \$11,610 receive a maximum credit of \$3,556. Finally, in the phase-out range, represented by CD in Figure 2.1, each additional dollar of earned income reduces the credit by 21 cents. Accordingly, people with an annual income above \$28,495 are no longer eligible for the credit. Table 2.1 summarizes the various EITC parameters for other types of households as well (where figures are expressed in

⁵ There is a proposal to disallow EITC to people with earning from dividends and interest above some threshold. President Clinton proposed a threshold of \$2,500, the Congress proposed \$1,000.

1994 dollars). Scholz (1994) estimates that 61 percent of the EITC recipients is in the phase-out range, 23 percent of the recipients occupies the phase-in range, the rest is in the flat range.

TABLE 2.1 – EITC PARAMETERS FOR 1996

	Phase-in region Credit rate	Flat region		Maximum credit	Phase-out region	
					Phase-out rate	Income cut-off
1 child	34	\$6,330	\$11,610	\$2,155	15.98	\$25,075
2+ children	40	\$8,890	\$11,610	\$3,555	21.06	\$28,495
no child ^a	7.65	\$4,220	\$5,275	\$325	7.65	\$9,500

^a Taxpayer must be between the ages of 25 and 65.

The design of the EITC in the US implies that the credit is not only awarded to people below the poverty line. Indeed, eligibility for the EITC extends up to an earned income of \$28,495. Scholz (1994) estimated that about half of the credit payments flow to people below the poverty line. In particular, about 7.5 million of the recipients of the EITC have an income above the poverty line, 5.4 million people have incomes below the poverty line, while 1.4 million people pass the poverty line due to the EITC.

The EITC is not only meant as income support for working families with low incomes, but also as an instrument to stimulate people with low incomes to increase their working hours. Indeed, the EITC is not withdrawn for people who pass the poverty line as this would substantially discourage labour supply of people around the poverty line. This makes the EITC less well targeted at workers under the poverty line than a program like the food stamps which is solely meant as income support. This latter program has high withdrawal rates as it strongly discourages work effort on the margin. To limit the costs, however, the EITC needs to be phased out to ensure that households with high incomes do not receive a credit. Indeed, the phase-out range of the EITC in the US is extended to household incomes just above the poverty line.

The EITC is the only tax credit in the USA that is refundable. If the credit is higher than the income tax the taxpayer has to pay, the Internal Revenue Service (IRS) actually pays the taxpayer the difference. The EITC can be obtained either in one payment at the end of the year, or in regular payments during the year. This regular payment in advance takes the form of a negative withholding by the employer. This latter option is used by less than one percent of the workers who are eligible for the EITC.

2.2 *Take-Up*

The EITC in the US is not received automatically: people have to apply for it by filing a tax return and completing a separate form for the EITC. This causes the take up rate to be lower than 100% as the US tax system is one of self assessment: potential taxpayers have to identify themselves to the IRS as taxpayers, instead of the IRS approaching them. People with an income lower than the income tax threshold do not have to file a tax return. However, if these people are eligible for the EITC, they should file a tax return to receive the net payment they are entitled to.

Despite the problem of getting the EITC to people who are unaware of the credit, there is a remarkable high take up of the EITC compared to other social schemes. The take up can be measured by the so-called take-up rate which measures the number of people that apply for the EITC in terms of the number of people eligible for it. Using data of the Survey of Income and Program Participation (SIPP), Scholz (1994) estimated the take up rate of the EITC in 1990 between 75 to 90 per cent. Most other estimates fell in the range of 80 to 85 per cent. This is high compared to estimates of the take-up rate of the Aid to Families with Dependent Children program (AFDC) which range from 62 to 72 per cent, or the food stamps which range from 54 to 66 per cent. One of the reasons for the high take up rate could be that receiving the EITC involves less stigmatization than other programs. Indeed, the EITC is available only for people who work. Hence, even though the EITC operates as a sort of welfare benefit, it probably will not be considered as such. Another possible explanation for the high take up of the EITC may be that people are by definition working in the formal sector and can be expected to be better informed about such programs than jobless people or people who work in the informal sector.

Scholz investigated the characteristics of people who do not file for the EITC although they are eligible for it. First, he found that education tends to have a negative effect on the take up. Second, the take up of the EITC was positively related to the EITC a taxpayer is entitled to. This suggests that people who do not claim the EITC, might do this rationally, for instance because the effort of filing a tax return is greater than the gain from receiving the EITC. An alternative explanation for people not applying for an EITC is that they do not want to be known by the IRS as they have been involved in underground activities.

Besides people who do not claim the EITC, there are also people who claim the EITC without being eligible for it. Indeed, if the number of taxpayers claiming the EITC is divided by the number of people that is found to be eligible by Scholz, a take up rate of 122 to 131 per cent results. Research conducted by the IRS over several years suggests that 37 to 46 per cent of the EITC claimants were claiming too high a credit. Between 28 and 39 per cent of the claimants were not eligible for any credit at all. The amount of inappropriately claimed credits was between 29 and 37 per cent. Hence, non-compliance is a problem

within the EITC. Scholz estimated the characteristics of the people who apply for the EITC without being eligible. He found that higher self-employment income had a positive effect on non-compliance. This self-employment income can be manipulated more easily than wage income and is therefore more open to fraud. Another reason for non-compliance could be the rules related to children. A child is not counted as a qualifying child for the EITC if less than 50% of the total costs of the child are paid by the taxpayer. With very low incomes, there is a reasonable chance that more than half of the income is paid by social security. Hence, the children in those households do not count for the EITC. There is also evidence that there is a considerable amount of fraud in claiming the EITC. Indeed, when the number of children had to be reported on the tax return according to the social security forms, the number of reported children would decrease by 10 percent.

2.3 Tax-Transfer Integration

The EITC may be considered as a social welfare transfer. However, in contrast to most welfare payments that are transferred through the social welfare system, the EITC is transferred via the tax system. Taxes and transfers can be seen as two components of the same system, with transfers being negative taxes. This notion has induced some economists to advocate the integration of the two systems. They argue that there is no justification for the different treatment of people with low incomes who are paid by the welfare system, and people with high incomes who pay taxes.

The advantage of providing transfers through the tax system is that traditional welfare administration is labour-intensive and expensive. Recipients do not like the welfare system because of the stigma involved in receiving welfare benefits. Using the tax system could lower administrative costs, reduce the social stigma and introduce more objective rules. However, there are also disadvantages to the tax-transfer integration.

Alstott (1994) described four problems related to tax-transfer integration. First, the measurement of income in the tax system differs from the welfare system. In the welfare system, wealth is taken into account which allows for a more accurate assessment of the needs of recipients. Second, the tax system uses a formal definition of family. In contrast, the welfare system explores whether there is a dependency relationship, even if this relationship is not between formal family members. Third, the annual accounting interval of the tax system makes it impossible to adjust to the immediate needs of benefit recipients. When people use an advance payment option, they run the risk of having to pay back part of the benefit if their financial position changes during the year. Finally, it will be more difficult to check eligibility within the tax system. Receiving a benefit through the welfare system involves meetings with a welfare officer, whilst receiving a

benefit through the tax system only involves filling in a form. This latter approach makes false applications easier.

In the US, the EITC is what comes closest to tax-transfer integration. When the EITC was first introduced it was almost entirely integrated into the tax system, besides some extra questions on the tax return. The expansions of the EITC changed it more in the direction of other social benefit schemes which require additional information from the household. Indeed, after the 1990 reform, taxpayers who claim the EITC have to fill in a special form in addition to the normal tax return. This form raises additional questions, e.g. about their children. On the one hand, this additional information allows the EITC to be better targeted at needy people. On the other hand, the information undermines the tax-transfer integration and increases administrative costs.

2.4 Effect of the EITC on Labour Supply

Research on the economic effects of the EITC in the US is primarily focused on the effects on labour supply. Standard economic theory suggests that the EITC affects both participation decisions and the number of hours worked. In particular, the reduction in the average tax burden on labour income stimulates participation of people who are currently (voluntarily) outside the labour force. The effect on hours worked operates through two different channels. First, the lower average tax burden for households which are eligible for the EITC adversely affects the incentives to supply labour in hours through the income effect. Second, the EITC may affect the marginal tax burden on households. In particular, the marginal tax burden declines for people in the phase-in range, remains constant for households in the flat range, and rises for those households with an earned income in the phase-out range. Whereas the lower marginal tax burden in the phase-in range raises the incentives for labour supply by inducing substitution from leisure to consumption, the higher marginal tax burden in the phase-out range reduces labour supply in hours. On balance, the income effect and the two opposing substitution effects render the effect on aggregate labour supply in hours ambiguous. Indeed, the effect on aggregate labour supply is an empirical matter and will depend on the magnitude of labour supply elasticities and the number of people in the different ranges of the EITC. A number of empirical studies have explored the effect of the EITC on aggregate labour in the US.

Dickert, Houser and Scholz (1995)

Empirical evidence seems to support the above mentioned effects. Dickert, Houser, and Scholz (1995) simulated the labour supply effects of the changes in the EITC law from 1993 to 1996. They used data from the 1990 Survey of Income and Program Participation to calculate which families would receive the EITC in 1993 and 1996. Using a simulation model calibrated with labour supply elasticities from Hausman (1981), MaCurdy et al. (1990) and Triest (1990), they

calculated the effects of an EITC on labour supply.⁶ The simulation results by Dickert et al. are presented in Table 2.2. It reveals that the effects on labour supply for people in the phase-in range is positive in all simulations, ranging from 1.88 to 13.46 per cent. For people in the phase-out range and the flat range, the effect on labour supply is negative. In absolute figures, these adverse effects in the flat range and the phase-out range are substantially smaller, however. Indeed, the adverse effect of the EITC in the phase-out range lies between 0.53 and 4.73 per cent. The reason for these smaller effects is that, compared to the other ranges, there are relatively more women in the phase-in range who feature a relatively high labour supply elasticity. Furthermore, the reduction in the marginal tax rate in the phase-in range is larger than the increase in the marginal tax rate in the phase-out range. Nevertheless, irrespective of what labour supply elasticities are taken, the effect on aggregate labour supply is always negative. This is because the flat range and the phase-out range are populated by more people than the phase-in range.

In the simulations by Dickert et al., the participation effect was ignored. As this effect on labour supply is strictly positive,⁷ the negative effects of the EITC are likely to be smaller than suggested by these simulations.

TABLE 2.2 – THE RESULTS OF THE SIMULATIONS BY DICKERT, HOUSER AND SCHOLZ

	Estimated per cent change in annual hours worked ^a		
	MaCurdy et al.	Triest	Hausman
Aggregate labour	– 0.09	– 0.54	– 4.04
<i>By credit range</i>			
Phase in	1.88	3.92	13.46
Flat	– 0.09	– 0.19	– 1.79
Phase-out	– 0.53	– 1.11	– 4.73

NOTE: The estimates given are median percentage changes. Medians are presented instead of means because a small number of very low income parents in the subsidy range have extremely high marginal rates and, therefore, extremely large simulated wage effects.

^a The median monthly hours for the sample is 160.

Source: Dickert, Houser and Scholz (1995).

6 Triest finds an uncompensated wage elasticity of 0.05 for men and 0.25 for women. The income elasticities are 0.0 for men and – 0.15 for women. The elasticities of Hausman and MaCurdy et al. are higher and lower, respectively.

7 The only people who might stop participating because of the EITC are partners. If the primary earner is in the EITC range without the partner's income, but outside the EITC range with the partner's income, this could be an incentive for the partner to give up working.

Eissa and Liebman (1996)

Eissa and Liebman (1996) took both the participation effect and the hours-worked effect into account. In particular, they compared two groups of single women, namely those with children and those without children. Because the EITC is available only to people with children, only single women with children are expected to respond to the EITC. Single women with children make up almost fifty per cent of the EITC eligible population. Eissa and Liebman examined the impact of the Tax Reform Act of 1986, which included an increase of the EITC besides other changes in the tax system. The other changes in the tax system were expected to affect single women with and without children in the same fashion. Therefore, the change in labour supply of women with children could be compared to the change in labour supply of women without children to estimate the effect of the EITC on labour supply. Eissa and Liebman also compared some alternative groups, such as women with children and low education *versus* women without children and low education. The data they used were taken from the March Current Population Surveys for the years 1985 to 1987 and 1989 to 1990. The data on labour market and income were taken from the year before the survey.

The participation effect of the EITC on single women with children was estimated at 2.5 per cent. This suggests that the EITC indeed increased participation. Eissa and Liebman also used probit regressions and they tried to avoid selection biases. In that case, the effects ranged from 1.4 per cent for all single women with children to 3.7 per cent for single women with children and low education. An explanation for the strong response of low-educated women is that women with a lower education have a higher possibility of earning an income in the EITC range. This suggests that the participation response was indeed caused by the EITC. The authors also investigated whether prior trends in labour market participation, the business cycle or changes in the AFDC may be possible explanations for the higher rise in participation of women. It turned out that these explanations do not overturn the positive effect of the EITC on labour market participation.

Eissa and Liebman also estimated the effect of the EITC on hours worked by people who were eligible for the EITC. In their regressions, the effects of the EITC on labour supply turned out to be positive, but not significantly different from zero. Accordingly, they argued that there was no evidence that the EITC decreased the number of hours worked by women already in the labour force. Hence, the participation decision seemed more elastic than the decision about the number of hours worked. Eissa and Liebman's explanation for this result is that most recipients receive the credit as a lump sum payment and are therefore unaware of the high marginal tax rates in the phase-out range. Indeed, most people who received the credit did not understand how the EITC worked or did not even know that they received the credit at all. Many of those people had their tax returns filled in by a financial adviser, and might view the payment they received

as the work of the adviser instead of the result of their own doing. If people consider the EITC as a lump sum payment, their response to the credit might not be as expected.

Eissa and Liebman cast some doubt on the reliability of their regressions due to the low R^2 s. Furthermore, the effect on labour supply was investigated in the two years after the change in the EITC. If one expects that behavioural responses to the EITC are a long term phenomenon, these figures do not adequately show the long-run effects of the EITC on labour supply. The results should therefore be interpreted with caution.

Scholz (1996)

Scholz (1996) also estimated a participation effect by using a different methodology than Eissa and Liebman. Instead of estimating the effect of the EITC directly, he investigated the effect of net wages on the probability of participating. Intuitively, people outside the labour force who would be eligible for EITC when working will be encouraged to participate if the EITC is expanded due to the higher after-tax wages. The tax rate was calculated from the change in after tax earnings when going from 0 to 20 hours of work, divided by gross earnings. Probit regressions were run for three groups: single parents, principal wage earners, and spouses. For all three groups, the parameter of the net wage was positive and significant. Hence, an increase in the after-tax average wage rate raised the participation rate. These estimates by Scholz suggest that an EITC may indeed have positive participation effects.

Browning (1995)

Compared to the previous studies, Browning (1995) is more pessimistic about the economic effects of an EITC. He argued that the positive effects on labour supply in the phase-in range are likely to be smaller than suggested by Dickert et al. (1995). This is because many people in the phase-in range during a given year have higher expected earnings in the future, even without the EITC. As most labour supply decisions are long term decisions, the positive effect of the EITC will be diminished if a large share of the people is only temporary in the phase-in range. The most important effects are thus obtained from the behavioural responses in the phase-out range.

Browning also showed that the effect of the EITC on disposable income was ambiguous in the phase-out range. In particular, the high marginal tax rate in the phase-out range reduced the number of hours worked, thereby causing a decline in disposable income as well. On balance, disposable income only rose if the EITC itself dominated the effect through the number of hours worked. For people with an income above \$20,500, Browning estimated that a higher EITC actually reduced disposable income. This outcome was rather sensitive to the compensated wage elasticity, which was set at 0.3. However, even if the wage elasticity

would be reduced to 0.15, a number of EITC recipients would experience a lower disposable income.

Browning also estimated the effects of the EITC on disposable income for people in the phase-in range and the flat range. For people in the phase-in range, disposable income increased by even more than the credit because people tended to raise the number of hours worked. However, as there were more people in the phase-out range than in the phase-in range, Browning argued that the overall effect on labour supply was likely to be negative.

To summarize, research by Dickert et al. and Browning confirm the theoretical effects of an EITC on labour supply. However, the underlying structure of these models already determines these expected behavioural responses. The research conducted by Eissa and Liebman estimated the effect of the EITC on labour supply directly and did not confirm the theoretical expectations with respect to hours worked. Moreover, this study estimated only short-run effects on labour supply. The evidence is thus inconclusive.

2.5 Reform of the EITC

The disadvantages of the EITC have induced some people to come up with alternative designs of the EITC. Yin et al. (1994) argued that the current design of the EITC in the US was an obstacle to achieve both compliance and participation in the program. They, therefore, suggested two alternatives for benefits for the working poor. The first proposal was to divide the EITC into two different benefits. The first credit would be a family allowance benefit. The easiest way to introduce such a benefit would be to provide a benefit for any family with children, similar to the Dutch system of child benefit. This favours both low and high income families. The credit would, however, benefit low-income families relatively more if this proposal would be accompanied by the abolishment of the current dependency exemption. The second credit would be an implicit benefit for the working poor by introducing a tax exemption in the social security tax, coupled with a higher social security tax rate. The advantage of this proposal compared to the EITC is that it makes different objectives more transparent. Indeed, the separation into two credits recognizes that the EITC aims at two different goals, namely, providing income support for poor workers and providing income support for individuals with children. Another advantage is that the administrative burden may be reduced. A drawback of the separation into two credits is that it is ill-targeted on the working poor with children. Indeed, the family credit would also flow to capital owners and high income workers with children. This would substantially raise the budgetary costs of the credit. Furthermore, the tax exemption would flow to all working poor, not only those with children.

The second proposal by Yin et al. was to replace the EITC by indirect assistance to low income workers through a tax benefit directed to their employers.

This is a subsidy comparable to the Dutch special tax allowance for low-paid workers (SPAK). This proposal assumes that there is no fundamental difference between paying a subsidy to the employer or paying a subsidy to the employee. Indeed, through equilibrium forces, the tax relief will ultimately fully benefit the low-paid workers. The advantage of this proposal is that the credit could be targeted on workers with a low hourly wage, rather than workers with a low annual income. Indeed, information about hourly wages may be available from the firm. Accordingly, high wage earners who work a limited number of hours can be excluded from the program. This brings us closer to the proposal suggested in the Dutch policy debate which is discussed in the next section.

3 AN EITC IN THE NETHERLANDS

Discussions about a possible EITC in the Netherlands focus on a different type of EITC than in the US. First of all, it is not primarily aimed at income support. Therefore, it does not depend on the number of children, while eligibility is related to individual income, rather than family income. Second, in contrast to the EITC in the US which is based on annual earned income, the EITC discussed in the Netherlands is based on hourly wages. Indeed, an EITC based on annual income also accrues to part-time workers with high hourly wages but low annual income. Since the Netherlands features the highest share of part-time work of all OECD countries, providing those people with an EITC makes the instrument ill targeted to the unskilled. For a given budget, each tax relief for part-time workers with high hourly wages crowds out the tax relief for low skilled workers with full-time jobs and low hourly wages. As the main objective of an EITC in the Netherlands is to reduce the unemployment rate among the low skilled who collect unemployment benefit, a targeted EITC that depends on hourly wages, rather than annual income, seems more promising. Indeed, in December 1997 the Dutch cabinet presented a white paper 'Taxes in the 21st century: an investigation' which contains a number of tax proposals, including a proposal for the introduction of an EITC based on hourly wages.

We have adopted the MIMIC model to explore the economic impact of different forms of EITC in the Netherlands. MIMIC is an applied general equilibrium model for the Dutch economy that is designed to explore the effects of tax policies on the Dutch labour market. The model contains a disaggregated description of the household sector by distinguishing 40 types of households. For each type, the model adopts class-frequency income distributions based on microdata. This micro-approach makes it possible to make a detailed assessment of the fraction of people in each household type that belongs to a specified income range. Accordingly, MIMIC is an appropriate tool to calculate the impact of an EITC on the labour market. For a more elaborate description of MIMIC, see Gelauff and Graafland (1994) and Bovenberg, Graafland, and de Mooij (2000).

In each EITC experiment, the *ex ante* (i.e. before behavioural responses to the credit are taken into account) reduction in tax revenue is 0.35% of GDP (i.e. 2.5 billion Dutch guilders).⁸ The government budget is balanced *ex ante* by an equivalent reduction in government consumption. If tax revenues increase due to behavioural responses, these are used to mitigate the reduction in public consumption. Hence, the *ex post* effect on public consumption is the long-run budgetary cost of the EITC.⁹

3.1 *The Wage Distribution in MIMIC*

The MIMIC model is calibrated on a data set for 1993. Microdata on income distribution allow for a detailed assessment of the fraction of people in each household type that belong to a specified income range. This is important information in order to calculate how many people will be eligible for the EITC.

Table 3.1 provides information on the wage distribution of workers with different levels of skill. MIMIC distinguishes three types of labour: unskilled, low skilled, and high skilled labour. For each of these skill types, the wage distribution is presented for two different categories of workers, namely, breadwinners and elderly workers (who feature a relatively small labour supply elasticity) and partners and single people (who feature a relatively high labour supply elasticity). Table 3.1 shows the fraction of workers of each category in a particular income range. It shows that 87% of the unskilled breadwinners and elderly have an income below 115% of the statutory minimum wage.¹⁰ For the low skilled this percentage is less than 3%. The fraction of low-skilled workers with an income between 150% and 180% of the minimum wage is relatively large. High-skilled workers typically earn an income of over 180% of the minimum wage. For partners and single persons, the wage distribution is more or less similar to that of breadwinners and elderly, albeit that they tend to earn somewhat lower wages.

8 For comparison with the US, note that one US\$ corresponds to approximately two Dutch guilders (DFL.).

9 The budget of the social security funds may change due to an EITC. In that case, we assume that the government balances the budget of the social security funds by means of a positive or negative transfer. This ensures that the social premium rates remain fixed *ex ante*. If the budget of these funds is affected endogenously due to behavioural responses, the social premium rates may change *ex post*.

10 The statutory minimum wage in the Netherlands in 1998 was slightly below DFL. 30,000 for a full-time job.

TABLE 3.1 – THE WAGE DISTRIBUTION IN MIMIC

Percentages per type ^a	< 115 ^b	115 ^b < x < 130 ^b	130 ^b < x < 150 ^b	150 ^b < x < 180 ^b	> 180 ^b
Breadwinners/elderly					
Unskilled	87.60	8.12	4.29	0.00	0.00
Low skilled	2.70	11.59	21.86	26.45	37.40
High skilled	0.00	0.02	4.97	14.82	80.18
Partners/singles					
Unskilled	93.11	5.00	1.89	0.01	0.00
Low skilled	0.67	7.82	12.00	44.12	35.40
High skilled	0.00	1.62	6.28	14.23	77.87

^a Based on hourly wage.

^b In percentages of minimum wage.

3.2 *The EITC Based on Annual Incomes*

This section discusses the simulation results with MIMIC of an EITC that is based on annual income. This EITC differs from the one implemented in the US tax system in two respects. First, it depends on individual income, rather than family income. Second, the EITC analyzed with MIMIC does not depend on the number of children. Although this alternative design makes it difficult to compare the effects of MIMIC with the US studies, it forms a benchmark for the simulations in the next section that involves an EITC based on hourly wages and which was recently proposed in the Netherlands.

In our experiment, the EITC amounts to 4% of annual labour income in the phase-in range. The maximum credit is DFL. 1,015 in a flat range between the statutory minimum wage (DFL. 30,000) and 115% of the minimum wage (DFL. 34,500). Subsequently, the EITC is phased out linearly up to 180% of the minimum wage (DFL. 54,000). Accordingly, the marginal tax rate in the phase-out range rises by more than 5%-points. The effects of the EITC based on annual incomes on replacement rates, average tax burden and marginal tax burden for different household types are given in the first column of Table 3.2. The first column of Table 3.3 presents the economic effects of the EITC.

Institutional changes

Table 3.2 shows that the EITC reduces the replacement rate for all skill types. In particular, the net income of workers in all skill types increases while unemployment benefits remain unchanged. The credit has the largest impact on the replacement rate of the unskilled since the credit is targeted at low annual incomes. The

replacement rate for the other skill types decreases less because a smaller number of households in these types benefit from the EITC (see the wage distribution in Table 3.1). This is also illustrated by the effects on the average employee's tax burden: the average tax burden for unskilled workers falls more substantially than that of skilled workers.

The marginal tax rate for the unskilled falls because a number of them are in the phase-in range (where the marginal tax rate drops), or in the flat range (where the marginal tax rate is unchanged). The high skilled and especially the low skilled face, on average, a higher marginal tax rate as a number of them fall in the phase-out range.

TABLE 3.2 – INSTITUTIONAL CHANGES DUE TO AN EITC IN THE NETHERLANDS ACCORDING TO MIMIC^a

	(1)	(2)	(3)	(4)	(5)
Replacement ratio	- 0.44	- 0.94	- 0.59	- 1.21	- 1.20
- unskilled	- 2.12	- 3.81	- 1.14	- 5.04	- 5.16
- low skilled	- 0.08	- 0.23	- 0.56	- 0.19	0.03
- high skilled	- 0.04	- 0.29	- 0.43	- 0.37	- 0.38
Average burden	- 0.71	- 0.66	- 0.74	- 0.67	- 0.67
- unskilled	- 2.68	- 4.63	- 1.47	- 6.64	- 8.22
- low skilled	- 1.15	- 0.95	- 0.99	- 0.73	- 0.51
- high skilled	- 0.55	- 0.32	- 0.71	- 0.21	- 0.14
Marginal burden ^b	0.81	1.24	- 0.10	1.01	0.64
- unskilled	- 1.08	- 1.26	- 0.83	- 1.83	- 2.38
- low skilled	1.96	4.18	- 0.07	4.23	4.15
- high skilled	1.02	1.36	0.04	1.10	0.62

^a Cumulated differences between simulation and base projection (effects in absolute changes).

^b Marginal burden on hourly wages for employees, measured by a weighted average for different workers in the income distribution.

(1) EITC based on annual income of DFL. 1,015 between 100-115% minimum wage, phased out at 180%

(2) EITC based on hourly wages of DFL. 1,890 between 100-115% minimum wage, phased out at 180%

(3) EITC of DFL. 500 not phased out

(4) EITC based on hourly wages of DFL. 2,775 between 100-115% minimum wage, phased out at 150%

(5) EITC based on hourly wages of DFL. 3,465 between 100-115% minimum wage, phased out at 130%

Economic effects

Table 3.3 indicates that an EITC in the Netherlands is an effective instrument to reduce the unemployment rate.¹¹ Indeed, the lower replacement rate induced by the EITC stimulates job search by the unemployed and reduces their reservation wage. Through both channels, the EITC facilitates job matching. Furthermore, the lower replacement rate weakens the bargaining position of the unions in collective bargaining. Hence, contractual wages fall. Through these channels, unemployment declines. Unemployment for the unskilled falls by 0.76 percentage points.¹²

Table 3.3 also reveals that the EITC increases the participation rate. Indeed, the lower average tax burden on small part-time jobs encourages partners who were previously voluntarily unemployed to join the labour force. In contrast, the average length of the work week falls. This reduction in labour supply in hours is the result of two opposing forces. On the one hand, secondary earners with small part-time jobs falling in the phase-in range raise their average labour supply in hours since their marginal tax burden decreases. On the other hand, primary earners and single persons reduce their labour 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, labour supply in hours drops.

According to MIMIC, the high marginal tax rate in the phase-out range also reduces the incentives for training. This is illustrated by the effect on the upgrading of skills through human capital accumulation. In particular, through adversely affecting training incentives, the EITC hampers the upgrading of skills, thereby raising unskilled labour supply at the expense of skilled labour supply. The underlying reason for the adverse effects on training is that a larger part of wage increases due to productivity gains accrue to the government in the form of a lower EITC, rather than to the worker. Accordingly, workers find it less attractive to enroll in on-the-job training.¹³ Through adverse productivity effects, this mitigates the positive effects on consumption. The higher marginal tax burden also induces substitution from labour supply in the formal sector towards the hidden economy. Hence, the informal sector expands at the expense of formal activities.

11 The effects on involuntary unemployment have been largely ignored in studies for the US since structural unemployment is typically a European phenomenon.

12 *Ex ante*, the after-tax income of workers increases due to the EITC, while the after-tax benefit level remains unchanged. As social benefits are indexed to gross wages, however, wage moderation causes a decline in the benefit level *ex post*. Hence, the price for the positive employment effects is a reduction in the income of those relying on social benefits. This illustrates the trade-off between equity and efficiency: tax reductions that are most favourable in raising employment typically harm equity.

13 Compared to Bovenberg, Graafland, and de Mooij (1998), the model used in this paper contains an alternative framework for on and off-the-job training. This alternative framework is described by de Mooij (1999).

The favourable economic consequences of the EITC render the *ex post* reduction in government consumption smaller than the *ex ante* reduction of 0.35% of GDP. Indeed, in the long run the budgetary cost of the EITC is about half of the *ex ante* cost.

3.3 An EITC Based on Hourly Wages

This section explores the implications of an EITC that depends on hourly wages rather than on annual income. In this experiment only workers who hold a full-time job and earn an hourly wage between the minimum wage and 115% of the minimum wage are eligible for the maximum EITC. The credit is reduced proportionally for workers who work less hours than a full-time job. Furthermore, it gradually drops with the level of the hourly wage rate between 115% and 180% of the minimum wage. This alternative form of EITC is better targeted at the low skilled than the EITC based on annual income. Indeed, with the same *ex ante* budget of 0.35% of GDP, the maximum credit that can be provided to low-skilled workers with a full-time job almost doubles to DFL. 1,890. The effects of this form of the EITC according to MIMIC are presented by the second column of Tables 3.2 and 3.3.¹⁴

Institutional variables

Replacement rates are calculated on the basis of a full-time job. A full time worker within the EITC range benefits more from this credit than from the EITC based on annual income because of the higher maximum credit. This holds especially for unskilled workers. Hence, the average tax burden and the replacement rate for the unskilled fall more substantially than in the previous experiment. However, the average tax for skilled workers drops less because skilled part-time workers who earn high hourly wages are no longer eligible for the credit.

The high marginal tax rates in the phase-out range only apply to hourly wages. Indeed, additional hours worked do not reduce the credit. The effects on the marginal tax rates on higher hourly wages for the different skill types have the same signs as in the previous experiment. The higher maximum credit makes this increase more pronounced, especially for the low skilled who primarily fall in the phase-out range (see Table 3.1).

14 Note that the minimum wage for people younger than 23 in the Netherlands is below the official minimum wage for regular workers. As MIMIC does not incorporate these minimum wages for young workers, a number of people in the income distribution receive wages below the official minimum wage. As the EITC proposals account for the minimum wage for youngsters, MIMIC thus overestimates the number of people in the phase-in range of the EITC.

TABLE 3.3 – ECONOMIC EFFECTS OF DIFFERENT FORMS OF EITC ACCORDING TO THE MIMIC MODEL^a

	(1)	(2)	(3)	(4)	(5)
	<i>percentage changes</i>				
Wage rate	-0.39	-0.61	-0.44	-0.68	-0.70
Private consumption	1.66	0.74	0.89	0.74	0.73
Labour supply (pers.)	0.72	0.15	0.3	0.19	0.25
– unskilled	0.74	1.19	0.3	1.75	2.17
– low skilled	1.14	0.04	0.48	-0.09	-0.10
– high skilled	0.6	-0.01	0.26	-0.01	0
Labour supply (hours)	-0.20	0	0.05	0.02	0.04
– unskilled	0.63	1.17	0.6	1.58	1.61
– low skilled	-0.12	-0.24	-0.10	-0.42	-0.43
– high skilled	-0.35	-0.12	-0.11	-0.11	-0.08
of which through human capital effect					
– unskilled	0.15	0.3	0.04	0.41	0.42
– low skilled	-0.05	-0.07	0	-0.10	-0.13
– high skilled	-0.01	-0.03	-0.01	-0.04	-0.03
Employment	0.48	0.83	0.67	0.91	0.92
– unskilled	1.74	2.84	1.25	3.63	3.9
– low skilled	0.64	0.64	0.79	0.47	0.38
– high skilled	0.22	0.54	0.54	0.58	0.57
Black labour supply	0.9	1.51	0.32	1.88	2.21
	<i>absolute changes</i>				
Unemployment rate	-0.47	-0.56	-0.41	-0.60	-0.58
– unskilled	-0.76	-1.13	-0.66	-1.37	-1.51
– low skilled	-0.54	-0.63	-0.48	-0.65	-0.59
– high skilled	-0.42	-0.46	-0.37	-0.48	-0.44
Employment ^c	28	49	40	54	54
– unskilled	12	19	9	25	27
– low skilled	7	7	9	5	4
– high skilled	9	22	22	24	23
Government consumption ^b	-0.16	-0.04	-0.13	-0.01	-0.01

^a Cumulated differences between simulation and base projection.

^b In percentage of GDP.

^c In 1000 labour years

(1) EITC based on annual income of DFL. 1,015 between 100-115% minimum wage, phased out at 180%.

(2) EITC based on hourly wages of DFL. 1,890 between 100-115% minimum wage, phased out at 180%.

(3) EITC of DFL. 500 not phased out

(4) EITC based on hourly wages of DFL. 2,775 between 100-115% minimum wage, phased out at 150%.

(5) EITC based on hourly wages of DFL. 3,465 between 100-115% minimum wage, phased out at 130%.

Economic effects

The second columns of Tables 3.2 and 3.3 show that the EITC based on hourly wages reduces the average tax burden and the replacement rate for unskilled workers more substantially than the EITC based on annual income. Through skill-specific wage formation, the lower average tax and the lower replacement rate for unskilled work reduces gross unskilled wages, thereby boosting demand for unskilled labour. Moreover, the lower replacement rate stimulates the search intensity and lowers the reservation wage of the unskilled, thereby facilitating the matching process for unskilled labour. Accordingly, the unemployment rate for the unskilled drops more substantially than under the EITC based on annual income.

The rise in the participation rate is smaller than in the previous experiment and more concentrated among the unskilled. This is because the EITC only reduces the average tax burden on part-time jobs with low hourly wages. Indeed, Table 3.3 reveals that the participation rate of unskilled persons increases substantially. However, as high-skilled persons are no longer eligible for the EITC, the participation rate of these persons falls. This latter effect partly reflects the lower transition of initially low-skilled workers into high-skilled jobs since on-the-job training is discouraged by the EITC (see below).

The negative effect on aggregate labour supply in hours is much smaller if the EITC is based on hourly wages. Indeed, the increase in the marginal tax rate in the phase-out range only applies to higher hourly wages and not to higher labour income on account of extra hours worked. Accordingly, labour supply in hours only drops on account of the income effect. Both the effects on participation and labour supply in hours are thus smaller (in absolute value) than in the previous experiment.

The marginal tax rate on higher hourly wages in the phase-out range rises more than in the previous experiment because the maximum credit is almost twice as large. This harms incentives to accumulate human capital. Hence, although an EITC depending on hourly wages does less harm to the quantity of labour supply it does more harm to the quality of labour supply. This adverse effect on the quality of labour supply is reflected in a smaller transition of workers from lower skill levels into higher skill levels. Accordingly, the labour supply of high-skilled labour falls relative to the base line and the labour supply of unskilled workers rises. Employment growth on account of the EITC is thus concentrated among unskilled jobs.

Table 3.3 also reveals that the higher marginal tax burden boosts the size of the underground economy because employers and workers have more incentives to pay part of the wage bill in an informal way, i.e. without reporting it to the tax authority.

3.4 Sensitivity Analysis

This section employs sensitivity analysis on the EITC based on hourly wages discussed in the previous section (i.e. the EITC presented in the second columns of Tables 3.2 and 3.3), which is referred to as the benchmark EITC. In particular, we explore the following three variations regarding the phase-out range of the EITC.¹⁵ First, no phase-out range and a maximum credit of DFL. 500. Second, a phase-out range between 115% and 150% of the minimum wage and a maximum credit of DFL. 2775. Finally, a phase-out range between 115% and 130% of the minimum wage and a maximum credit of DFL. 3465. The results of these simulations are given in the last three columns of Tables 3.2 and 3.3.

No phase-out range

If the EITC is not phased out, each worker with an hourly wage above the minimum wage who holds a full-time job receives a fixed credit of DFL. 500. For part-time workers the credit is reduced proportionally. In this experiment, the maximum credit for an unskilled worker is smaller than in the benchmark case, but more people receive a credit. Accordingly, the replacement rate for the unskilled declines less than in the benchmark, but the replacement rate for the high-skilled and low skilled drops more. Furthermore, without phasing out the EITC, the marginal tax rate does not increase.

The lower replacement rate increases the search effort of the unemployed, reduces their reservation wage, and reduces gross wages as it undermines the threat point of employees. Subsequently, unemployment falls. As the replacement rate drops less than in the benchmark, the reduction in unemployment is smaller, especially for the unskilled.

The participation effect for unskilled partners is smaller than in the benchmark since the credit for the unskilled is smaller. However, the credit also stimulates participation of low and high skilled partners on the labour market. Although labour supply in hours may drop slightly due to the income effect, this effect is dominated by the positive effect on total labour supply due to an increase in the participation rate.

The marginal tax rate does not rise if the EITC is not phased out. Indeed, Table 3.2 shows that the marginal tax burden even falls because part-time workers face a lower marginal tax burden on hours worked. This raises their labour supply, stimulates investments in human capital and reduces black labour supply compared to the benchmark. Accordingly, this design of the EITC yields more favourable effects on productivity and consumption, but is less effective in reducing unemployment.

¹⁵ Van Oers (1998) also employs sensitivity analysis on different phase-in ranges and flat ranges. The results tend to be rather robust with respect to these ranges, as compared to differences in the phase-out range.

Compared to the benchmark case, the effects on employment are less concentrated among the unskilled. Indeed, the fixed EITC does not seriously discourage training and does not hamper the upgrading of skills. The small decline in human capital is caused by the lower average tax burden. In particular, as for most people the marginal tax burden remains unchanged, lower incomes benefit relatively more from the credit than higher incomes. As training efforts are determined by relative income differentials between jobs with different skill levels, this slightly reduces the incentives for training.

Shorter phase-out range

In the benchmark case, the EITC is phased out between 115% and 180% of the minimum wage. The last two columns of Tables 3.2 and 3.3 show the effects of two EITCs with alternative, more rapid phase-out ranges, namely, between 115% and 150% of the minimum wage and between 115% and 130% of the minimum wage. The advantage of closer targeting is that the maximum credit for people who earn the minimum wage rate can be higher, thereby cutting the replacement rate of the unskilled more substantially. Indeed, the maximum credit rises to DFL. 2775 if the EITC is phased out at 150% of the minimum wage and to DFL. 3465 if it is phased out at 130% of the minimum wage. Closer targeting also implies, however, that less people are eligible for the EITC.

The larger reduction in the replacement rate for the unskilled implies a stronger decline in the unemployment rate among the unskilled. As the unemployment rate is highest among the unskilled, targeting is also effective in cutting the aggregate unemployment rate. Indeed, compared to the benchmark EITC, the moderately targeted EITC is more effective in reducing the aggregate unemployment rate. However, there tend to be decreasing returns with respect to targeting. In particular, a moderately targeted version of the EITC is slightly more effective in reducing the aggregate unemployment rate than the most heavily targeted EITC. This suggests that an inverse U-shaped curve describes how the effectiveness of the EITC in cutting unemployment varies with the degree of targeting. Hence, moderately targeting the EITC seems the most effective way to reduce the overall unemployment rate.

In case of a more strongly targeted version of the EITC, less people fall in the phase-out range where the marginal tax rate increases. However, those who do fall in the phase-out range feature an extremely high marginal tax rate since a higher credit is to be phased out over a smaller income range. The adverse effects on training are thus concentrated among a smaller group, namely the unskilled. This is reflected by the stronger increase in unskilled labour supply, which reflects the decrease in the transition of workers from unskilled to low-skilled jobs and from low-skilled into high-skilled jobs. Indeed, the reduced incentives for on-the-job training hamper the upgrading of skills. Accordingly, the boost in employment due to the targeted EITC's is concentrated among unskilled jobs while skilled employment expands only slightly.

Effectiveness of the EITC

Graafland and de Mooij (1999) have adopted the MIMIC model to compare the effectiveness of the EITC to a number of other instruments suggested in the literature aimed at reducing unemployment, including cuts in employers' social security premiums on low-skilled work, introducing wage subsidies for the long-term unemployed, and other types of inwork benefits (see Dreze and Malinvaud (1994), Snower and de la Dehesa (1996), Haveman (1996), and Sørensen (1997)). All these proposals aim to reduce low-skilled unemployment without seriously damaging the incomes of transfer recipients. Graafland and de Mooij (1999) show that, in general, targeting tax cuts at the low skilled or the long-term unemployed is more effective in reducing unemployment than across-the-board tax reductions. However, targeted tax cuts typically yield less favourable effects on the quality and quantity of labour supply and, therefore, on consumption. There seems to be a trade-off in designing tax reforms between cutting unemployment and stimulating the quality and quantity of labour supply.

4 CONCLUSIONS

This paper discusses the economic effects of an Earned Income Tax Credit. It starts with a survey of the literature on the EITC, which mainly originated in the United States. In the US, the EITC is primarily aimed at reducing poverty among low-income workers. Indeed, the EITC depends on the number of children in the household of the worker and annual family income. The literature suggests that the EITC is likely to have important effects on labour supply behaviour. In particular, people who did not participate on the labour market before an EITC was introduced, may be encouraged to start working as the average tax burden drops. Empirical studies suggest that this participation effect is indeed important. The effect of the EITC on labour supply in hours, however, is ambiguous. On the one hand, theory suggests that labour supply falls due to the income effect induced by the EITC. On the other hand, the EITC causes a positive substitution effect on labour supply in the phase-in range, but a negative substitution effect in the phase-out range. On balance, studies yield mixed results regarding the effect on aggregate labour supply in hours.

In the Netherlands the introduction of an EITC would aim at reducing the unemployment rate among low-skilled workers, rather than providing income support to poor working families. Indeed, unemployment among the unskilled is still a structural problem in the Netherlands. The proposals for an EITC in the Netherlands are based on individual hourly wages, rather than on annual family income. Furthermore, the credit does not depend on the number of children. These modifications make an EITC more effective as an instrument to reduce the replacement rate for low skilled full-time workers. Indeed, our MIMIC simulations reveal that this targeting principle makes the EITC based on hourly wages more effective in reducing the unemployment rate, although there tend to be decreasing

returns with respect to the targeting concept. Furthermore, the EITC based on hourly wages does not suffer from adverse incentive effects on the quantity of labour supply.

Apart from these positive effects, the EITC based on hourly wages also has some drawbacks. First of all, MIMIC reveals that the high marginal tax burden on hourly wages may have adverse effects on the incentives for training. This has negative effects on labour productivity. Furthermore, less training may slow down the upgrading of skills of those low-skilled people currently in the labour force, thereby reducing the opportunities for the low-skilled unemployed to find a job.

A second drawback of this type of EITC is that it relies on additional information about a worker, namely the number of hours worked in the formal sector. This information is currently not available to the tax authority in the Netherlands and seems rather vulnerable to fraud. MIMIC indeed shows that the high marginal tax burden due to the EITC stimulates workers to report a lower income to the tax authority than they actually earn. However, MIMIC does not include fraud related to the number of hours worked. As suggested by van Koesveld (1998), one way out of this problem is to provide the EITC to firms that employ workers with low hourly wages, instead of providing it to workers through the tax bill. Firms are then obliged to transfer the EITC to their employees. The advantage of this system is that the Dutch government has already introduced a special relief for social security contributions for those employers who employ workers with low hourly wages, the so-called SPAK. Hence, information about the number of hours worked is already available from firms that are eligible for the SPAK. Another advantage of the link between the EITC and the SPAK is that take up is automatic: if the employer applies for the SPAK, the EITC is automatically paid to the worker who is also eligible for the SPAK. This link also means that payment may occur throughout the year instead of a lump sum payment at the end of the year. A drawback of linking the SPAK and the EITC is that it might be especially vulnerable to fraud. Indeed, both the employer and the employee face an incentive to report more hours worked and lower hourly wages than is actually the case. Therefore, the combination of a SPAK and an EITC based on hourly wages is unlikely to be a permanent policy measure. Furthermore, it is by no means certain that the EITC is fully reaped by unskilled workers if it is provided to the employer. Indeed, the EITC may become subject to a bargaining game between the employer and the employee. In that case, the EITC may not add much compared to the existing SPAK.

A final drawback of the EITC is that most people receiving low hourly wages are young single persons or secondary earners who currently do not receive unemployment benefits (see CPB (1997)). This makes the EITC ill-targeted at the low-skilled primary earners who are looking for a full-time job. Indeed, most primary earners with low skills receive wages above 130% of the minimum wage.

These problems in the design of an EITC based on hourly wages have made the Dutch government reluctant to actually introduce it. Indeed, in its coalition agreement Parliament has decided upon the introduction of a fixed earned income tax credit that does not contain a phase-out range. This avoids problems associated with a high marginal tax rate in the phase-out range or with fraud concerning the number of hours worked. Part-time workers who receive an annual income below the minimum wage will receive a percentage tax credit, rather than the full credit. This makes the credit better targeted at workers with a full-time job.

REFERENCES

- Alstott, A.L. (1994), 'The Earned Income Tax Credit and Some Fundamental Institutional Dilemmas of Tax-Transfer Integration,' *National Tax Journal*, 47, pp. 609–619.
- Bovenberg, A.L., J.J. Graafland, and R.A. de Mooij (2000), 'Tax Reform and the Dutch Labor Market: An Applied General Equilibrium Approach', *Journal of Public Economics* (forthcoming).
- Browning, E.K. (1995), 'Effects of the Earned Income Tax Credit on Income and Welfare,' *National Tax Journal*, 48, pp. 23–43.
- CPB (1997), Economische verkenning voor de volgende kabinetsperiode.
- Dickert, S., S. Houser, and J.K. Scholz (1995), 'The Earned Income Tax Credit and Transfer Programs: A Study of Labor Market and Program Participation', in: J.M. Poterba (ed.), *Tax Policy and the Economy* (Vol. 9), pp. 1–50.
- Drèze, J.H. and E. Malinvaud (1994), 'Growth and Employment: The Scope for a European Initiative,' *European Economy* 1, Brussels.
- Eissa, N. and J.B. Liebman (1996), 'Labor Supply Response to the Earned Income Tax Credit', *Quarterly Journal of Economics* 111 (2), pp. 605–637.
- Graafland, J.J. and R.A. de Mooij (1999), 'Fiscal Policy and the Labour Market: An AGE Analysis', *Economic Modelling* 16, pp. 189–219.
- Hausman, J.A. (1981), 'Labour Supply', in: J.T. Poterba (ed.), *How Taxes Affect Economic Behavior*, pp. 27–72.
- Haveman, R. (1996), 'Reducing Poverty while Increasing Employment: A Primer on Alternative Strategies and a Blueprint', *OECD Economic Studies* 26, Paris.
- Koesveld, E.B.K. van (1998), 'Lastenverlichting met de Earned Income Tax Credit,' *ESB* 4146, pp. 264–268.
- MaCurdy, T, D. Green, and H. Paarsch (1990), 'Assessing Empirical Approaches for Analyzing Taxes and Labour Supply,' *Journal of Human Resources*, 25, pp. 415–490.
- Mooij, R.A. de (1999), 'Endogenizing (employ)ability in MIMIC,' Internal Memo I/99/06, CPB, The Hague.
- Oers, F.M. van (1998), 'In Search of an Optimal EITC,' Internal Memo I/98/11, CPB, The Hague.
- Parliament (1997), 'Belastingen in de 21e eeuw: Een verkenning,' The Hague.
- Scholz, J.K. (1994), 'The Earned Income Tax Credit: Participation, Compliance, and Antipoverty Effectiveness,' *National Tax Journal*, 47, pp. 63–85.
- Scholz, J.K. (1996), 'In-Work Benefits in the United States: The Earned Income Tax Credit,' *Economic Journal*, 106, pp. 156–169.

- Shapiro, I. and R. Greenstein (1993), *Making Work Pay: The Unfinished Agenda*, Center on Budget and Policy Priorities, Washington D.C.
- Snowder, D.J., and G. de la Dehesa (1996), 'Unemployment Policy: Government Options for the Labour Market,' CEPR and Cambridge University Press, Cambridge.
- Sørensen, P.B. (1997), 'Public Finance Solutions to the European Unemployment Problem,' *Economic Policy*, pp. 221–251.
- Triest, R.K. (1990), 'The Effect of Income Taxation on Labour Supply in the United States,' *Journal of Human Resources*, 25-3, pp. 491–516.
- Walker, R. and M. Wiseman (1997), 'The Possibility of a British Earned Income Tax Credit,' *Fiscal Studies* 18, pp. 401–425.
- Yin, G.K., J.K. Scholz, J.B. Forman, and M.J. Mazur (1994), 'Improving the Delivery of Benefits to the Working Poor: Proposals to Reform the Earned Income Tax Credit Program,' *American Journal of Tax Policy*, 11, pp. 225–298.

