

Earned Income Tax Credit

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Abstract

In recent policy discussions in the Netherlands, the Earned Income Tax Credit (EITC) has been put forward as an effective instrument to reduce the unemployment rate among low-skilled workers. Using the MIMIC model, this article shows that a targeted EITC at low incomes indeed seems effective in reducing unemployment. However, the targeting concept features decreasing returns. Furthermore, targeting typically harms the quantity and quality of labour supply. The EITC based on hourly wages, which has been proposed in the Netherlands, also suffers from serious problems related to tax design.

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Introduction

The Netherlands suffers from a relatively high structural unemployment rate among unskilled workers. In particular, the unemployment rate in 1996 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 unemployed. Indeed, the replacement rate for low-skilled workers, i.e. the net 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 employment. Recent tax proposals in the Netherlands focus, therefore, on reducing the replacement rate among the low skilled – e.g. through the introduction of a so-called Earned Income Tax Credit (EITC). Indeed, the recent White Paper on taxes in the 21st century in the Netherlands contains a proposal for an EITC.

The EITC has already been used in the United States for over 20 years. In the US, however, the primary goal of the EITC is to reduce poverty among low-income workers, rather than 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.

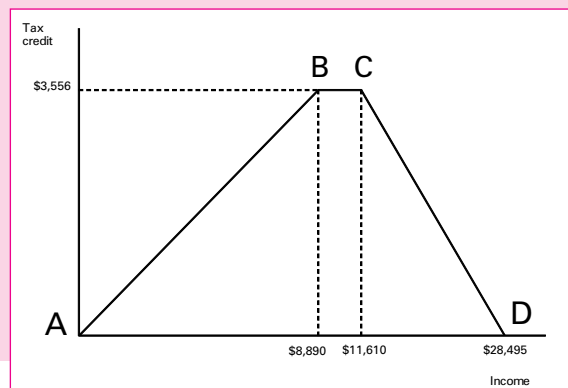
This paper discusses the optimal design of the EITC in the Netherlands in light of the goal of reducing unemployment. To that end, it adopts an applied general equilibrium model for the Netherlands, called MIMIC. This model has been developed to explore the labour-market effects of various tax policies and policies related to social security reforms.

The Earned Income Tax Credit in the US

The Earned Income Tax Credit (EITC) was introduced in the US in 1975. It started out as a small programme aimed at offsetting the social payroll tax for poor working families with children. Major expansions of the programme came later. The EITC is now the largest cash programme directed at low-income households.

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

Figure 1 The Earned Income Tax Credit in the US (household with two children in 1996)



The EITC contains three ranges. Figure 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 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 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 the line CD in figure 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.

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Table 1 The estimated labour supply effects of the EITC in the different studies

	Aggregate labor supply	Participation effect	Phase-in range	Flat range	Phase-out range
Dickert et al.	–	0	+	–	–
Eissa & Liebman	+	+	0	0	0
Browning	–	0/+	+	–	–

Studies on the economic effects of the American EITC

Research on the economic effects of the EITC in the US has focussed primarily on the effects on labour supply. In particular, standard economic theory suggests that the EITC affects labour supply through three main channels. First, it reduces the average tax burden on labour income. This may stimulate the participation of people who are currently (voluntarily) outside the labour force. Second, the lower average tax burden for households that are eligible for the EITC adversely affects the incentives to supply labour through the income effect. Finally, the EITC affects 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 the number of hours supplied by labour. 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 EITC’s effect on aggregate labour in the US. Table 1 provides an overview of the results from those studies. First, simulations by Dickert et al. (1995) suggest that the negative effects on labour supply, associated with the income effect and the negative substitution effect in the phase-out range, dominate the positive effects due to the lower marginal tax burden in the phase-in range. Hence, the EITC reduces aggregate labour supply. According to Eissa and Liebman (1996), however, this conclusion may be misleading since it ignores the potential effects of the EITC on the participation rate. In particular, since the EITC is provided only to households with an earned income, it may stimulate the labour supply of people who currently do not participate in the labour market. Indeed, Eissa and Liebman find that the participation effect is significantly positive for single women with children. Furthermore, estimates of Eissa and Liebman suggest that the effect of the EITC on hours worked does not significantly differ from zero. Accordingly, they conclude that there is no evidence that the EITC decreases the labour supply of people already

in the labour force. Browning (1995), however, argues that the positive effects on labour supply found by Eissa and Liebman may well be overestimated. In particular, a number of people in the phase-in range are likely to 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 counteracted if a large portion of the people in the phase-in range realise that they are in this range only temporarily.

Effects of a Dutch EITC based on annual incomes

We have adopted the MIMIC model to explore the economic impact of an 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 for 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 micro data. This micro approach paves the way for 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 Graafland and De Mooij (1998).¹

The EITC that has been analysed with MIMIC 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 that is analysed with MIMIC does not depend on the number of children. Although this alternative design of the EITC 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 that 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), which is around the median income in the Netherlands. The ex-ante (i.e. before behavioural responses to the credit are taken into account) reduction in tax revenue due to the introduction of the EITC is 0.35% of GDP (i.e. 2.5 billion guilders). The government budget is balanced ex-ante by an equivalent reduction in government consumption. If tax revenues increase due to behavioural responses, these

Table 2 Economic effects of five forms of an EITC according to MIMIC, financed by an ex-ante reduction in public consumption by 0.35% GDP.

	(1)	(2)	(3)	(4)	(5)
	Percentage Changes				
Production	0.4	0.8	0.9	1.0	0.9
Employment	0.6	1.0	0.7	1.1	1.1
Labour supply (pers.)	2.7	0.6	0.5	0.8	1.0
Labour (hours)	-0.2	0.1	0.1	0.1	0.1
Black labour (hours)	0.9	1.5	0.1	1.8	2.2
Human capital (index)	-0.2	-0.2	0.1	-0.1	-0.1
	absolute changes				
Ratios					
Unemployment	-0.5	-0.6	-0.4	-0.7	-0.6
– unskilled	-0.9	-1.3	-0.7	-1.5	-1.7
Replacement ratio	-0.5	-1.0	-0.6	-1.2	-1.2
Marginal burden ^a	0.7	1.1	-0.2	0.9	0.5

^a Weighted average of micro burdens on hours worked of employees

- (1) An EITC for low annual wage incomes, phased out between 115%-180% of minimum wage
(2) An EITC for low hourly wage rates, phased out between 115%-180% of the minimum wage
(3) An EITC for all households that is not phased out
(4) An EITC for low hourly wage rates, phased out between 115%-150% of the minimum wage
(5) An EITC for low hourly wage rates, phased out between 115%-130% of the minimum wage

are used to mitigate the reduction in public consumption. Hence, the experiment is budgetary neutral ex-post. The simulation results are presented in the first column of Table 2.

According to the MIMIC results, an EITC in the Netherlands is an effective instrument to reduce the unemployment rate.² Indeed, the EITC reduces the replacement rate, especially for low-paid work. Accordingly, the unemployed search more intensely for a job and 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 these channels, unemployment declines. Unemployment for the unskilled falls by 0.9 percentage points.

Table 2 reveals also that the EITC increases the participation rate. Indeed, the lower average tax burden on small part-time jobs encourages those partners to join the labour force who previously decided not to participate. In contrast to this, 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 declines. On the other hand, partners with substantial part-time jobs, 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 because more people fall in the phase-out range.

According to MIMIC, the high marginal tax rate in the phase-out range reduces also the incentives for training.

Indeed, the human capital index falls because a larger part of wage increases due to productivity gains accrues to the government in the form of a lower EITC. Accordingly, the positive effects on production are mitigated. The higher marginal tax burden also induces substitution from labour supply in the formal sector towards the hidden economy. Indeed, the informal sector expands.

Effects of a Dutch EITC based on hourly wages

The EITC that was analysed above is based on annual earned income. Hence, the EITC accrues also to part-time workers with high hourly wages but low annual incomes. 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. Indeed, for a given budget, each tax relief measure 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 benefits, a targeted EITC that depends on hourly wages, rather than annual incomes, seems more promising. Indeed, such an EITC has recently been proposed by the Dutch government in its White Paper on a tax-reform proposal.

We have employed MIMIC to explore the implications of this proposal of the EITC. In particular, in this experiment only workers who hold a full-time job and earn an hourly wage between the minimum and 115% of the minimum wage are eligible for the maximum EITC. The credit is reduced proportionally for workers who work less than full time. Furthermore, it gradually drops with the level of the hourly wage rate between 115% and 180% of the minimum wage. This alternative form of the EITC is better tar-

geted at the low skilled than the EITC based on annual incomes. Indeed, with the same ex-ante budget of 0.35% of GDP, the maximum credit that can be provided to low-skilled workers with full-time jobs almost doubles to f1,890. The effects of this form of the EITC according to MIMIC are presented by the second column of Table 2.

The EITC based on hourly wages reduces the replacement rate for unskilled workers more substantially than the EITC based on annual income. This decline in the replacement rate reduces wages, thereby boosting demand for labour, and especially for unskilled labour. Moreover, the lower replacement rate stimulates the search intensity and lowers the reservation wage of the low skilled, thereby facilitating the matching process for unskilled labour. Accordingly, the unemployment rate for the unskilled and the low skilled drops more substantially than under the EITC based on annual income.

The rise in the participation rate is smaller than in the previous experiment. This is because the EITC reduces the average tax burden only on part-time jobs with low hourly wages. The negative effect of the EITC on labour supply in hours has disappeared. Indeed, the increase in the marginal tax rate in the phase-out range applies only to higher hourly wages and not to higher labour incomes on account of more hours worked. Accordingly, labour supply in hours drops only 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. On balance, aggregate labour 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, although an EITC that depends on hourly wages does less harm to the quantity of labour supply, it still harms the quality of labour supply. Furthermore, we see that the higher marginal tax burden boosts the size of the hidden 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.

Sensitivity analysis: targeting the EITC

In the previous experiment, the EITC was phased out between 115% and 180% of the minimum wage. The last three columns of Table 2 show the effects of various EITCs (based on hourly wages) with alternative phase-out ranges.

No phase-out range

In the experiment in the third column, there is no phase-out range. In that case, the maximum EITC of DFL 435 is provided to all workers. Accordingly, the replacement rate for the unskilled declines less than in the previous experiments, but the replacement rate for high- and low-skilled workers drops more. 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. As the replacement rate drops less than in the previous experiment, the reduction in unemployment is smaller.

The participation effect for unskilled partners is smaller, 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, the third column of Table 2 reveals that the marginal tax burden even falls because some people may fall in the phase-in range. This may raise the investment in human capital and reduce labour supply on the black market. Accordingly, this design of the EITC yields more favourable effects for production, but is less effective in reducing unemployment.

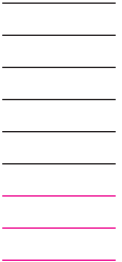
More targeting

In the fourth and fifth columns of Table 2, we show the results of an EITC that has a more rapid phase-out range, namely, between 115% and 150% of the minimum wage (the fourth column) or between 115% and 130% of the minimum wage (the fifth column). The advantage of more targeting is that the maximum credit for people who earn the minimum wage rate can be larger, thereby cutting the replacement rate of the unskilled more substantially. The disadvantage is that the marginal tax rate in the phase-out range increases more sharply and the (larger) decline in the replacement rate applies to fewer persons.

A moderately targeted version of the EITC (fourth column of Table 2) is slightly more effective in reducing the aggregate unemployment rate than the most targeted EITC (fifth column of Table 2). Also, compared to the less targeted EITC (second column of Table 2), the moderately targeted EITC is more effective in reducing the aggregate unemployment rate. 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 to be the most effective way to reduce the overall unemployment rate.³

Design of an EITC

The Dutch proposal for an EITC based on hourly wages thus seems better targeted at the low skilled than an EITC based on annual income. According to our MIMIC simulations, this targeting principle makes the EITC based on hourly wages more effective in reducing the unemployment rate. Furthermore, the EITC based on hourly wages



does not suffer from negative incentive effects on the quantity of the labour supply.

Apart from these positive effects, an 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 incentives for training. This has a negative effect on labour productivity. Furthermore, it 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. The qualitative notion about the effects on human capital is difficult to translate into a reliable quantitative effect, since empirical evidence on the impact of taxes on training is scarce. A second drawback of the EITC is that it relies on additional information concerning workers, 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. 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. Firms are then obliged to transfer the EITC to their employees. The advantage of this is that the Dutch government has already introduced a special relief programme for the social security contributions of 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 for a certain employee, then the EITC is automatically paid to that employee. This link also means that payment may occur throughout the year instead of in 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 not obvious that the incidence of the EITC is fully reaped by unskilled workers if it is provided to the employer. Indeed, the EITC may be 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 collect unemployment benefits (see CPB, 1997). Hence, this makes the EITC ill-targeted at the low-skilled primary earners who are looking for a full-time job. Indeed, most of 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 cabinet reluctant to actually introduce it. Indeed, the government's recent coalition agreement has decided upon the introduction of a fixed earned income tax credit of DFL 1,000 that does not contain a phase-out range. Part-time workers who receive an annual income below 70% of 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. Furthermore, it avoids problems associated with a high marginal tax rate in the phase-out range of the EITC. Indeed, our calculations with MIMIC suggest that this policy is somewhat less effective in reducing unemployment among the unskilled, but also less harmful for the quality and quantity of labour supply.

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Notes

- ¹ In MIMIC, labour-supply elasticities are taken from empirical studies for the Netherlands. In particular, the uncompensated labour supply elasticity for married women is set at 0.8, for single persons 0.25 and for married men 0.1. The income elasticities are 0.2 for women, 0.05 for single persons and almost zero for men.
- ² The effects on unemployment have been largely ignored in studies for the US, since structural unemployment is typically a European phenomenon.
- ³ 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.