The Effect of a Reduced Allowance and Pension Taper Rate: Policy Simulations Using the Melbourne Institute Tax and Transfer Simulator *

Guyonne Kalb and Hsein Kew
Melbourne Institute of Applied Economic and Social Research
The University of Melbourne

Melbourne Institute Working Paper No. 25/02

ISSN 1328-4991 (Print)
ISSN 1447-5863 (Online)
ISBN 0 7340 3108 4

November 2002

*We would like to thank the Department of Family and Community Services for funding this research and providing comments on an earlier version of the paper. The views expressed in this paper are those of the authors and do not represent the views of the Minister for Family and Community Services, the Department of Family and Community Services or the Commonwealth Government.

Melbourne Institute of Applied Economic and Social Research
The University of Melbourne
Victoria 3010 Australia
***Telephone* (03) 8344 3701**
***Fax* (03) 8344 5630**
***Email* melb-inst@unimelb.edu.au**
***WWW Address* http://www.melbourneinstitute.com**

Abstract

This paper presents the results of two policy simulations for couples with and without children. The first policy involves a reduction of the highest withdrawal rate from 70 to 60 per cent. The second policy reduces all withdrawal rates of 70 and 50 per cent to 30 per cent. A comparison is made between the two policies to determine the magnitude of the impact on government expenditure and labour supply responses.

Both policies have the effect of increasing the net income of those who are either partly relying on benefit payments or whose pre-reform income is just above the pre-reform cut-out points. Other people are unaffected, which means that overall government expenditure will increase.

Behavioural simulations show that married men and women seem to be relatively unresponsive to the first policy. This implies that minor changes in the withdrawal rate do not seem to be effective. The second policy induces larger behavioural changes. The transition matrices suggest that married women are more responsive to a reduction in the taper rate than men. Overall, women are working less on average whereas men tend to work more on average. These results are similar to the effects found in the US and UK literature.

1. Introduction

This paper examines the impact of the hypothetical policy change of reducing withdrawal rates on government expenditure and on the choice of hours worked and the labour force participation rates among couples of all ages with and without children[1]. To perform this task, we use the Melbourne Institute Tax and Transfer Simulator (MITTS)[2], which is a microsimulation model. MITTS consists of two components called MITTS-A and MITTS-B. MITTS-A provides information about the expected revenue and expenditure before and after the policy reform based on the assumption that individuals do not change their hours worked. This assumption is relaxed in MITTS-B where individuals are allowed to react to a hypothetical policy reform through choosing an optimal level of hours worked. The behavioural changes are predicted through the use of labour supply models. One purpose of this paper is to illustrate the behavioural effects implied by the newly implemented wage and labour supply results in MITTS (Kalb and Scutella, 2002 and Kalb, 2002a respectively). Another aim is to explore the potential effect of policy changes and compare the effect of smaller and larger changes.

Two separate simulations referred to as policy A and B are carried out with the base system set to the March 1998 tax and transfer system. Policy A reduces the highest withdrawal (taper) rate from 70 to 60 per cent and policy B reduces all withdrawal rates of 50 and 70 per cent to 30 per cent. The only exception is the Parental Income withdrawal rate for Youth Allowances and the Special Benefit withdrawal rate, which remain at 25 per cent and 100 per cent respectively. A comparison is made between the two policies to determine the magnitude of the impact on labour supply if taper rates are reduced to a smaller or larger extent. Note that policy A only affects allowances, because the highest taper rate for pensions is 50 per cent only, whereas policy B affects both allowances and pensions.

The database used as the basis for the simulations is the 1997/1998 Survey of Income and Housing Cost (SIHC) and so weekly incomes are based on the financial year 1997-1998. Reported revenue and expenditure are expressed in 1998 dollars. All tables use weighted

---

[1] In the behavioural simulations, men and women over 65 are assumed to remain at their current labour supply. Changes are only simulated for people of work age, who are not full-time students or self employed. The latter two groups also remain at their current labour supply.

[2] See Creedy et al. (2001, 2002) for detailed information and a guide to the use of the MITTS model.

results to represent the population, unless otherwise indicated, and simulated revenue and expenditure are expressed in 1998 dollars.

Expenditure and revenue in the before reform situation are calculated using MITTS, rather than being based on observed benefit payments in the SIHC. The following section discusses some assumptions that are made in the MITTS model, which result in the base case in the simulations having a higher level of expenditure than was observed in the actual pre-reform situation. The next stage of development of the MITTS model is to include the welfare participation "choice" in the labour supply model, which models the household's behaviour regarding labour supply and take up of benefits jointly. This allows for non-take-up of benefit payments.

The plan of the paper is as follows. The next section briefly addresses the main qualifications and assumptions underlying the MITTS model. Section 3 discusses the results from MITTS-A and the findings from MITTS-B are presented in Section 4. Section 5 concludes the paper.

2. Methodology

The simulation of the effects on costings and labour supply, resulting from the introduction of the Australian New Tax System, is carried out through MITTS. MITTS calculates net incomes for each household in the 1997/1998 Survey of Income and Housing Cost based on the wage rates of individuals (either observed in the data or imputed using the estimated wage equations as described in Kalb and Scutella (2002)), hours worked, other income, and some individual and household characteristics. The net incomes can be calculated using different tax and transfer systems, allowing hypothetical and real policy changes to be analysed. In this paper we compare results using the March 1998 tax and transfer system with results obtained by applying two hypothetical changes to the March 1998 system. In these calculations several issues need to be addressed. We discuss a few of the more important aspects of MITTS in this section[3].

These are, first the issue of eligibility and take up of benefits; second the need to combine information from different years; and third the use of labour supply modelling to estimate behavioural responses.

---

[3] More information on MITTS can be found in Creedy et al. (2002).

2.1. Eligibility

The information in the Survey of Income and Housing Cost (SIHC) is used to calculate eligibility for the different social security payments. Detailed information on the different sources of income are available that help in determining this eligibility. However, we cannot check all requirements for eligibility with the available data. For example, information on assets is not available and the amount of assets may also influence eligibility. Fortunately, the group of households that would not be eligible based on their level of assets (which excludes the home), but would be deemed eligible based on their level of income is relatively small. Particularly, because the SIHC records income from investments (like dividends or interest) and superannuation income, which are incorporated in the calculations, this is unlikely to be a major problem. Other requirements for eligibility, which we cannot check, are whether someone has been a resident for at least two years and is actively looking for work (one of the requirements for this may be that the unemployment benefit recipient is not working more than a certain number of hours[4]).

At the moment, MITTS does not allow for individuals who decide not to take up the benefits for which they are eligible. This is likely to cause some overestimation of expenditure on the different payments. Although the current receipt of benefits as recorded in the SIHC could be used to get an amount closer to the actual amount, this cannot help us to decide whether after a reform someone will take up a benefit. To simulate changes, we would need to make assumptions or estimate a model that accounts for take up of benefits.

Thus, we assume a 100 per cent take up. This may overestimate the effect of the policy, especially in the second reform where all taper rates are reduced to 30 per cent, which is a rather extreme policy change and which would draw in a large number of newly eligible households. This in turn could lead to a large overestimate of the increase in expenditure, particularly if in the real world there is a maximum number of hours one can work while remaining eligible for unemployment-related payments. However, if these results were to be used for policy purposes, alternative simulations could be run cutting off eligibility for people

---

[4] From discussion with FaCS, we learnt that the number of hours of work someone has, may preclude them from unemployment-related benefit receipt, if this level of labour supply precludes effective job search. However, there seems no particular hours level available that could be seen as the cut-off point above which no one would receive benefit payments.

working over a certain number of hours. Several scenarios, using different hours cut-off points could be used to explore sensitivity of the results to this cut-off point.

2.2. Combining different years of data

The simulation procedure involves data from several years of the Survey of Income and Housing Cost and information on the taxation and social security regimes of several years. A few transformation steps are needed to combine these years in the analysis.

First of all, the behavioural part of the simulation procedure is based on labour supply models. These models are estimated using the Survey of Income and Housing Cost from 1994/95, 1995/96, 1996/97 and 1997/98 with the corresponding taxation and social security rules. Combining several years of data actually helps to identify the model, since slightly different tax regimes were operational in the four years. This provides more variation in net incomes at different hours of labour supply than would otherwise be the case. To estimate one model combining the four years, the net incomes calculated over a range of different possible hours have to be made comparable over the four years. This can be achieved by expressing the calculated net incomes in each of the years in the dollar value of one year. That is, we have to account for the change in the real value of the dollar. We choose to express all net incomes in 1997/1998 dollars and use the Consumer Price Index to inflate the other years' net incomes to the corresponding 1997/1998 level, before using them in the labour supply model.

In the simulation, all income and wage information is expressed in March 1998 values to match the social security and tax system in the pre-reform situation. The simulated policy changes in this paper are hypothetical, so we keep the system date at March 1998 and only change the required parameters. The costings in the tables are all expressed in March 1998 dollars.

2.3. The labour supply response

The estimation of the expected labour supply changes is based on the labour supply model estimated in Kalb (2002a). The model is neoclassical and based on one common utility function for the household. Although alternative models, incorporating more realistic assumptions on utility maximization in the household or allowing for home production to

enter the model independently, are available, these models would introduce additional complications[5] and as a result keeping all the current detail of the tax and transfer system would be impossible. Given the aim of MITTS to simulate policy changes with regard to the tax and transfer system and to assess its effect on labour supply, priority is given to incorporating all possible detail on taxes and transfers.

A discrete model specification is chosen to enable us to deal with the full detail of the tax and transfer system, both for single person households and for couples. A relatively large number of labour supply points is chosen. Households are assumed to choose from 0, 5, 10, 15,…., 50 hours of labour supply. However, fewer points are allowed for married men given the low number of married men working part-time hours (which can be caused by factors on both the supply and the demand side). They are assumed to choose from 0, 10, 20, 30, 40 or 50 hours. However, given the probability approach of simulating changes, small changes in labour supply can still be captured even in a ten-hour interval labour supply specification. A small change in labour supply means they may have a small probability of moving from 30 to 40 hours, for example.

Given the choice for this particular type of labour supply model, simple simulations of a change in all taper rates to 30 per cent show that the model seems quite robust to alternative specifications (Kalb, 2002b). The alternative specifications assessed in that paper included a reduction in the number of labour supply points, an alternative specification of the utility function and an alternative specification of the cost of working. Notwithstanding the reassuring result with regard to alternative specifications, when analysing the results one needs to keep in mind that the behavioural responses are based on a statistical model with the uncertainty that is always associated with modelling complex behaviour. A model is a simplified representation of reality, however, it is based on observed patterns of behaviour and it helps us to think about the possible effects of changes in a structured framework. Further work is planned on improving the model by incorporating welfare participation, an

---

[5] To estimate a model where each household member has their own utility function, information is needed on the private consumption of individuals or on the amount of income allocated to them. No data set combines information on consumption or home production, income sources, and labour supply, so strong assumptions are often needed on how income is shared to allow estimation of collective utility models or on the value and amount of home produced goods to estimate models that explicitly allow for home production, instead of implicitly as in the unitary utility models.

alternative approach to the imputation of wages for non-workers and including childcare costs.

To reduce the impact of prediction errors in the labour supply model on the simulation results, the starting point of the behavioural simulations carried out by the MITTS model is based on the actual working hours in the data[6]. That is, labour supply before the reform is fixed on observed labour supply. This prevents prediction errors in the model from impacting on the distribution of working hours in the base situation. The labour supply model includes an error term to account for optimisation errors and this error term is used to calibrate the model in such a way that observed labour supply is the starting point. Basically the procedure is that we draw from the possible values for the error term and only use those draws in calculating the expected labour supply that places the individual at the observed labour supply in the pre-reform situation. This approach uses the unobserved characteristics (that is the value of the error term) as well as the observed characteristics, on which the calculation of expected utility levels derived from each labour supply level is based. The two components jointly determine which labour supply point an individual prefers.

In 517 cases, the labour supply model could not generate 100 draws at the observed labour supply within a total of 5000 draws. This indicates that for these cases the model does not do so well and the predicted level of labour supply is far from the observed level of labour supply. For these households, labour supply after the reform is kept at the same level as before the reform, thus possibly underestimating the total number of changes as a result of the reform.

The approach taken ensures that the results before the reform from MITTS-A (the part of MITTS without behavioural changes) and from MITTS-B (with behavioural changes) are quite similar. The difference between the two is the rounding to quintuples in MITTS-B and the dropping of a few observations, which have wages under $4.00 or over $100 per hour (only 69 observations out of about 5900 observations drop out because of this selection).

Labour supply is kept constant for some groups who are expected to be different in their responses compared to the average working-age individuals. These groups are the self-

[6] A possible future improvement to MITTS would be to look into providing confidence intervals with predicted changes. This is however not straightforward like in a simple regression model, but would require a simulated approach.

employed (644 cases), those on disability payments (235 cases), full-time students (67 cases) and people over 65 years of age (715 cases). This leaves us with 3618 households for whom we simulate the effect of the policy reform on labour supply. This is the group for which we allow a behavioural change to occur.

When simulating the effect of a reform, the error terms that are accepted in the base case are used to predict the changed labour supply. This provides us with the probabilities of changing from the observed labour supply point to any of the other labour supply points and the probability of remaining at the same labour supply level. These probabilities can then be used to calculate an expected value of labour supply or percentages of individuals moving from one category to another.

Finally, it should be noted that the behavioural changes do not account for the demand side of the labour market. The model only reflects the supply side of the labour market. If individuals prefer to work more hours after a reform then they can only do so if there is a demand for their labour. In MITTS, it is assumed that all additional labour supply is met by a sufficient demand for labour.

3. Non-behavioural Simulation Results (MITTS-A)

This section presents the 'morning-after' effects of making a series of reforms to withdrawal rates associated with allowances and pensions available to households satisfying various eligibility criteria. To generate these results the non-behavioural version of MITTS (MITTS-A) is used. It is important to note that the pre-reform system in MITTS relies on the information provided by the SIHC in terms of population characteristics and all non-benefit income, however, receipt of benefits in the base system is imputed based on observable characteristics rather than relying on the reported information on benefit income in the data[7]. Thus it is assumed that any individual in the labour force (either employed or unemployed) is eligible for unemployment related benefits subject only to the means test (see the previous section for more discussion). For these reasons, expenditure on payments, particularly on unemployment benefits, is likely to be overestimated in the model.

---

[7] Certain payments such as Disability Support Pension, Sickness Allowance, Carer Payment, and the Department of Veterans Affairs pensions do rely on observed receipt in the base data, as no other information is available to help us identify eligible recipients.

Reducing the taper rate has the effect of increasing the cut-out points for couples who are eligible for allowances or pensions. An increase in cut-out point means that couples whose income is just above the pre-reform cut-out points, making them ineligible for income support, will now become eligible for allowances or pensions. In addition, couples whose pre-reform income falls in the relevant taper rate range will have an increased net income after the reform. Thus, policy A and B increase the net income for those who are working a low number of hours and/or those who work for low wages. Non-working individuals are not affected by these reforms.

Assuming constant labour supply and a 100 per cent take-up rate, the number of benefit recipients (couples relying on income support) is expected to increase as a result of the higher cut-out point.

Figures 1 and 2 show the respective effects of policy A on the net income and effective marginal tax rate schedules for a hypothetical couple with 2 children aged between 5 and 12 years. Figures 3 and 4 show the effects of policy B on the net income and the effective marginal tax rate. To illustrate the impact of both reforms, it is assumed that the reference person in this family earns a relatively high wage of $22.42 per hour, so the full effect of both changes can be observed. The figures are created conditional on the partner not working.

Figure 1: Net income schedule of a hypothetical couple with two dependent children, the reference person is on a hourly wage rate of $22.42 and the spouse is not working under the March 98 system and under policy A

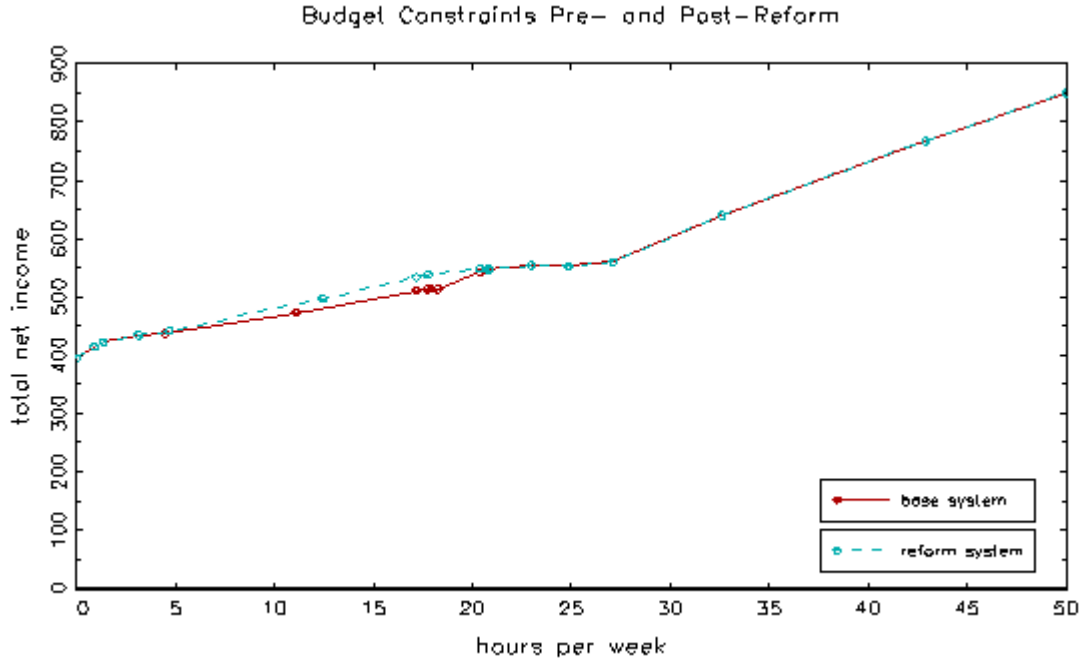
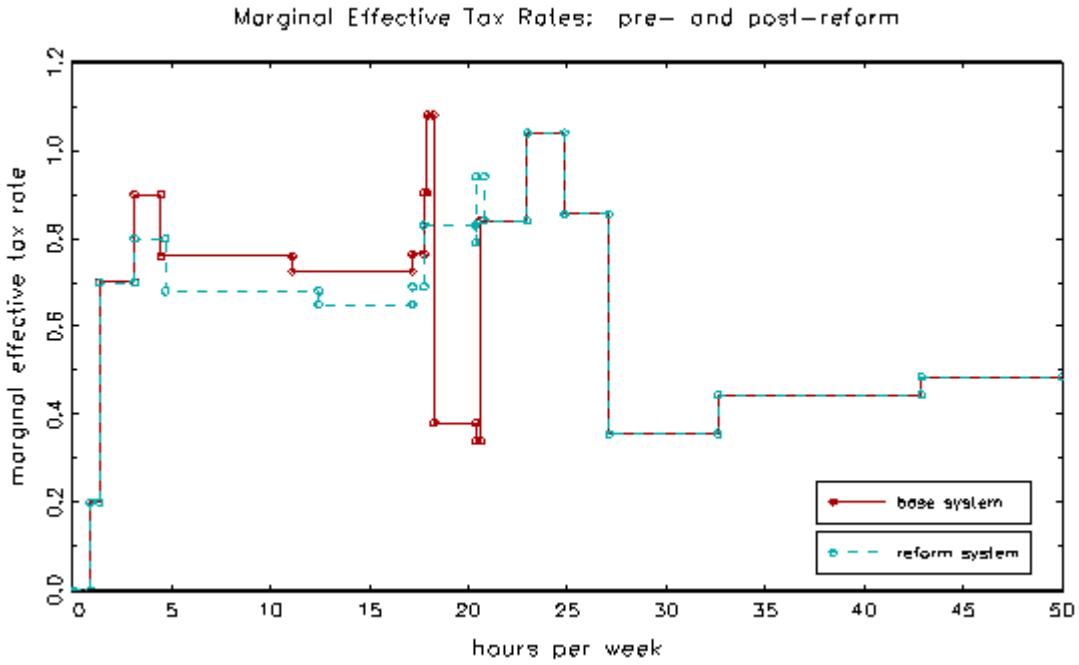


Figure 1 shows that the reduction in the highest withdrawal rate from 70 to 60 per cent increases net income for this household in the range from 5 to 21 hours of labour supply[8]. METRs are lower than before from 3 to 18 hours and higher than before from 18 to 21 hours of labour supply (the point at which the original maximum family payment would have been completely tapered out).

Figure 2: Marginal effective tax rate of hypothetical couple with two dependent children, reference person is on a hourly wage rate of $22.42, spouse is not working under the March 98 system and under policy A



The effect of policy B is shown in Figures 3 and 4. As expected the change to an overall 30 per cent withdrawal rate has an enormous effect on net income. For this household, net income has increased from about 2 to 39 hours of labour supply[9]. METRs are mostly lower than before from 2 to 27 hours and higher than before from 27 to 39 hours of labour supply (the point at which the original maximum family payment would have been completely tapered out). At the point where benefit payments are completely tapered out (at about 39

[8] Families on lower wages would see a similar flattening of their budget constraint, but it would affect a wider range of hours.

[9] Families on lower wages would see a similar flattening of their budget constraint, but it would affect a wider range of hours.

hours), net income makes a sudden drop. This is caused by the income test on Family

Figure 3: Net income schedule of hypothetical couple with two dependent children, reference person is on a hourly wage rate of $22.42, spouse is not working under the March 98 system and under policy B

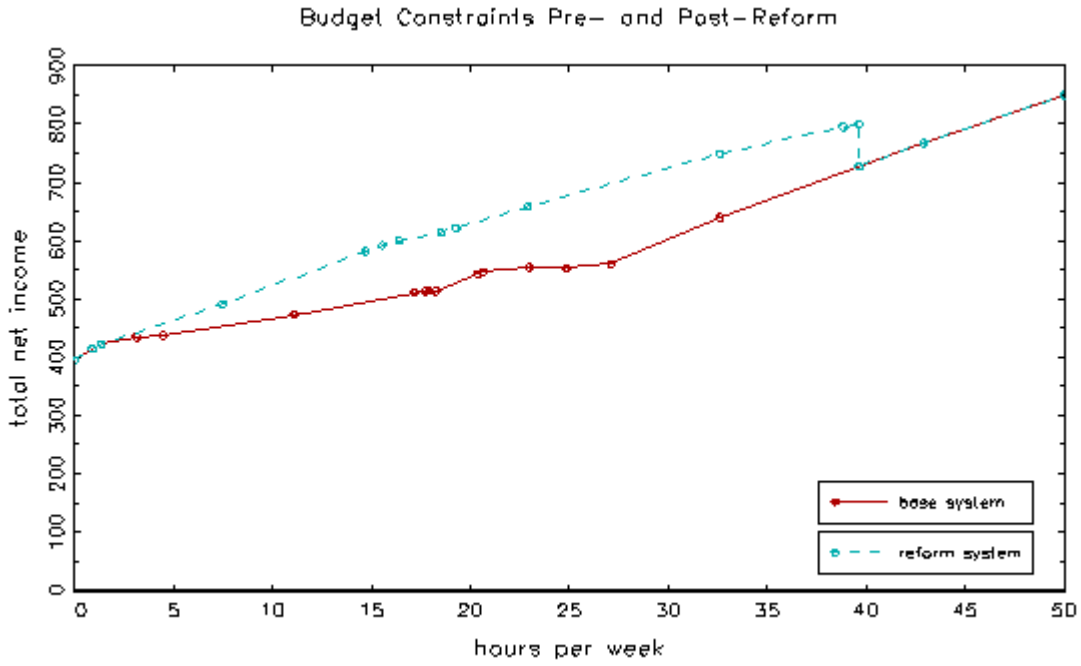
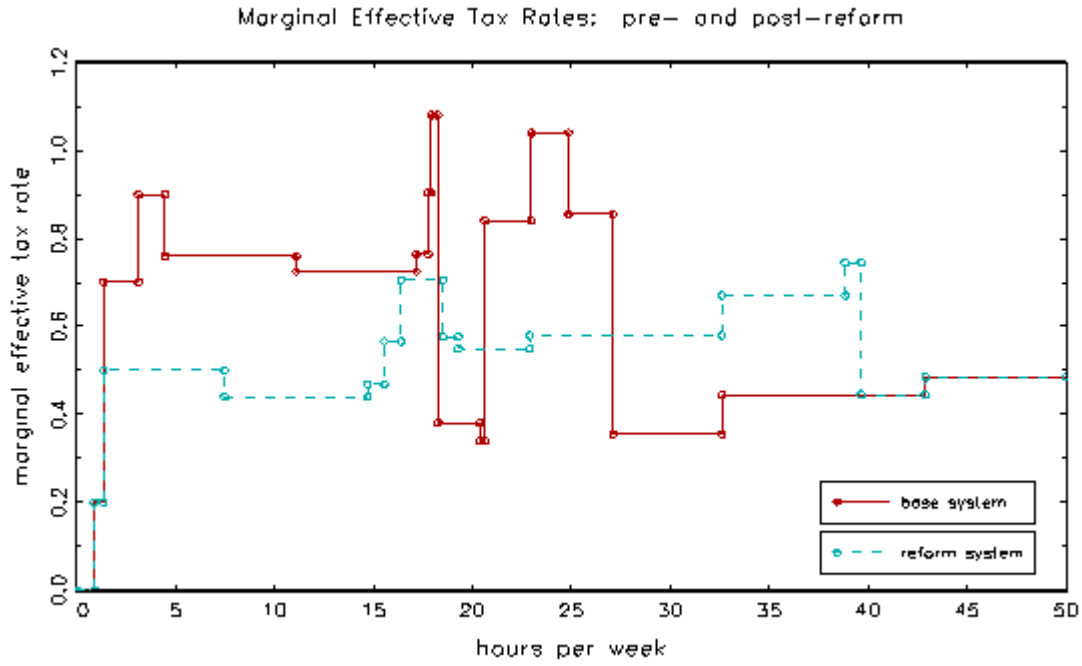


Figure 4: Marginal effective tax rate of a hypothetical couple with two dependent children, reference person is on a hourly wage rate of $22.42, spouse is not working under the March 98 system and under policy B



Payments coming into effect at that point. In the current system and in that of March 1998, everyone who is eligible for an allowance or a pension is not subject to the income test for Family Payments, but is automatically eligible for the maximum rate of payment. Thus, in addition to the larger amount of earned income that recipients may keep in the reform system, they also remain eligible for the maximum rate of Family Payment while they are on relatively high income levels.

Subsection 3.1 presents the expected cost to the government if policy A and B were to be implemented. Subsection 3.2 categorises the changes in income-unit income in terms of individuals' characteristics. The distribution of marginal effective tax rates is reported in Subsection 3.3.

3.1. Effects on Government Revenue and Expenditure

For the tables throughout the paper, the letters "a" and "b" are used to refer to the results from policy A and B respectively. Tables 1a and 1b present the amount of various components of government revenue and expenditure before and after the reform under the assumption that individuals do not vary their number of hours worked.

Table 1a: Main Revenue and Expenditure

Tax or Transfer	Cost ($m)		Numbers (thousands)	
	Before reform	Net change	Before reform	Net change
Government Revenue				
Income Tax	50177.4	43.2	7014	29
Medicare Levy	3087.4	10.4	4482	43
Total	53264.8	53.6		
Government Expenditure				
Tax Rebates	2497.4	-42.8	4397	29
Family Payment	4065.6	20.2	1380	0
FTP/FTB	398.4	0.0	591	0
Allowances	6823.6	455.0	1531	123
Pensions	10881.8	0.0	1617	0
Pharm Allow	117.8	0.3	1678	4
Rent Allowance	531.2	17.9	407	7
Total	25315.9	450.5		
Net Expenditure	-27949.0	397.0		

Table 1b: Main Revenue and Expenditure

Tax or Transfer	Cost ($m)		Numbers (thousands)	
	Before reform	**Net change**	**Before reform**	**Net change**
Government Revenue				
Income Tax	50177.4	1057.0	7014	378
Medicare Levy	3087.4	132.2	4482	380
Total	53264.8	1189.2		
Government Expenditure				
Tax Rebates	2497.4	-555.5	4397	150
Family Payment	4065.6	1662.3	1380	0
FTP/FTB	398.4	178.9	591	370
Allowances	6823.6	6011.5	1531	1460
Pensions	10881.8	816.5	1617	103
Pharm Allow	117.8	10.8	1678	154
Rent Allowance	531.2	251.4	407	194
Total	25315.9	8376.0		
Net Expenditure	-27949.0	7186.8		

The first column under the heading "before reform" in Tables 1a and 1b shows the amount of government revenue and expenditure based on the March 1998 tax system. The second column provides an estimate of the net change in revenue and expenditure resulting from the policy reform. The third column shows the number of persons in Australia who pay taxes and receive various government payments. The last column presents the estimated net change in the number of persons receiving government payments as a result of the policy reform. These values are weighted to reflect the Australian population in 1998. As noted earlier, the majority of benefits and taxes are calculated based on entitlements and not on actual receipt. It therefore presumes that everyone who is entitled to a particular form of benefits will receive these payments. In addition, these entitlements are calculated based on income tests only and assets are not taken into account.

As expected with an increased generosity in benefit payments, the overall net expenditure of the government increases. Comparing Tables 1a and 1b, it is obvious that reducing all taper rates to 30 percent (policy B) has a much larger effect on the government revenue and expenditure as well as the number of benefit recipients than a reduction in the highest taper rate only (policy A). For example, an estimated 1,531,000 recipients receive allowances, which after the reform increases by an additional 123,000 (Policy A) compared to 1,460,000

(Policy B). This is because in policy B, the cut-out income is higher than in policy A after the reform, drawing in a larger number of formerly ineligible households. As mentioned earlier, pension costs are not affected by policy A since the taper rate for pension payments does not change under Policy A.

The increase in family payments occurs because of the link between social security payments and family payments. Everyone who is eligible for one of the social security payments is not subject to the income test for family payments. Therefore, the increased number of people eligible for social security payments means more families receive the full family payment. However, these additional families on social security payments were already in the lower income ranges before the reform, so that they were eligible for at least part of the family payment. As a result, the number of people on family benefits has not changed after the reform. The interaction between allowance or pension receipt and the Family Payment income test means the large positive effect on net income of a reduced taper rate is reinforced for families with children because of this link between allowance/pension receipt and family payment income tests. However, as a result there may now be a larger discontinuity in net income when benefit eligibility ceases, since the family payment will drop considerably when the allowance or pension is completely tapered out. This effect can be seen in Figure 3 at the 39 hours point.

Lowering the withdrawal rates for couples increases the net incomes of a substantial number of benefit recipients. Allowances contribute the most to the increase in government expenditure for both policies. However, allowances are taxable and therefore government revenue is also expected to rise. Table 1b shows that the cost increase of allowances is substantially higher than the cost increase of pensions. Compared to pension recipients, allowance recipients are much more likely to work at least a few hours and as a result are more likely to be affected since the changes in withdrawal rates only have an effect on people who are working.

A more detailed breakdown of the payments for allowances, pensions (only for Policy B) and rebates are shown in Table 2a and Table 2b. A large proportion of the increased allowance costs is associated with Newstart and Parenting Payment for couples. These are the largest groups of payments and recipients are more likely to work than recipients of other payments.

By definition, Sickness Allowance recipients do not work, which is why there is no change after the reform.

Table 2a: Allowances

Tax or Transfer	Cost ($m)		Numbers (thousands)	
	Before reform	Net change	Before reform	Net change
Allowance Costs				
Parenting Pmnt (cpl)	2520.8	152.4	792	23
Sickness Allowance	145.9	0.0	19	0
AUSTUDY/ABSTUDY	189.1	0.0	30	0
Newstart Allowance	2311.9	209.2	415	72
Mature Age Allowance	166.8	19.0	39	4
Youth Allowance	12.4	0.5	3	0
Special Benefit	222.1	0.0	34	0
Partner Allowance	1254.7	74.0	199	24
Total Allowance Cost	6823.6	455.0		
Rebate Costs				
Beneficiary Rebate	208.0	9.1	667	39
Pension Rebate	982.7	0.0	1229	0
Low Income Rebate	710.8	-0.4	4995	-2
Dep Spouse Rebate	1470.0	-51.4	1376	-23
Total Rebate Cost	3371.5	-42.8		

The total amount of tax rebates shown in Tables 1a and 1b does not match the total amount of tax rebates shown in Tables 2a and 2b. The reason for this is that the different components of tax rebate presented in Tables 2a and 2b show the potential tax rebates that people are eligible for, without considering the amount of tax paid. To determine the total actual rebate this potential rebate is compared to the total amount of tax paid and the minimum of these two amounts is the actual rebate. The actual rebate can only be determined for the total amount of rebate and not for the separate components. The total amount of tax rebates presented in Tables 1a and 1b represent the actual total amount of tax rebates received.

The largest change in rebates occurs in the Dependent Spouse Rebate. The amount has decreased as a result of the increase in the spouse's incomes through an increase in parenting payments. An increase in the amount of beneficiary rebates arises from the additional couples who are eligible for a benefit payment after the reform and were not eligible before the reform.

Table 2b: Allowances

Tax or Transfer	Cost ($m)		Numbers (thousands)	
	Before reform	Net change	Before reform	Net change
Allowance Costs				
Parenting Pmnt (cpl)	2520.8	2328.6	792	331
Sickness Allowance	145.9	0.0	19	0
AUSTUDY/ABSTUDY	189.1	29.2	30	6
Newstart Allowance	2311.9	2554.5	415	909
Mature Age Allowance	166.8	200.2	39	52
Youth Allowance	12.4	2.3	3	0
Special Benefit	222.1	0.0	34	0
Partner Allowance	1254.7	896.8	199	162
Total Allowance Cost	6823.6	6011.5		
Pension Costs				
Age Pension	7132.5	666.5	1082	95
Dis.Support Pension	1540.9	0.0	217	1
Wife's Pension	722.5	31.0	103	2
Carer's Payment	69.4	1.3	9	0
Veteran Pension	959.7	65.0	143	5
Veterans Dis.Pension	443.8	0.0	62	0
War Widows Pension	13.0	0.0	1	0
Total Pension Cost	10881.8	816.5		
Rebate Costs				
Beneficiary Rebate	208.0	91.9	667	422
Pension Rebate	982.7	0.0	1229	0
Low Income Rebate	710.8	-20.4	4995	-116
Dep Spouse Rebate	1470.0	-611.7	1376	-246
Total Rebate Cost	3371.5	-567.4		

3.2. Changes in the Individual's Income-Unit Income

Tables 4a, 4b, 5a and 5b present the distribution of changes in weekly net income-unit income experienced by individuals resulting from the change in taper rates. First individuals are categorised in terms of income deciles (see Tables 4a and 4b), then by age, employment status, and number of children (see Tables 5a and 5b). The income measure is net weekly non-equivalised income-unit income[10]. For example in Table 4a, 0.2 per cent out of the 844

[10] This means that each person in the couple is assigned the total income of the income unit to which they belong, without taking into account the number of adults and children in the income unit who have to share this income.

individuals in Decile 1 experience an increase in their income-unit income by an amount ranging from $5 to $10 per week after the reform. Tables 4a and 4b represent the number of individuals in the SIHC 1997/98 sample whereas the individuals in Table 5a and 5b are weighted to reflect the Australian population in 1997/1998.

Table 4a: Income Gainers/Losers by Household Income deciles (unweighted results)

Individual level per capita non equivalised income-unit income									
	Decrease in $				Increase in $				
	<10	5-10	1-5	none	1-5	5-10	>10	Average	Count
Decile01	-	-	-	98.8	0.9	0.2	-	0.1	844
Decile02	-	-	-	80.2	4.5	2.9	12.4	2.7	838
Decile03	-	-	-	59.6	3.3	9.5	27.6	6.6	842
Decile04	-	-	-	64.3	2.4	6.2	27.1	6.7	840
Decile05	-	-	-	88.6	1.2	2.4	7.9	2.0	840
Decile06	-	-	-	97.4	0.7	0.5	1.4	0.3	842
Decile07	-	-	-	98.8	0.2	0.5	0.5	0.1	840
Decile08	-	-	-	100.0	-	-	-	0.0	842
Decile09	-	-	-	100.0	-	-	-	0.0	840
Decile10	-	-	-	100.0	-	-	-	0.0	840
Total	-	-	-	88.8	1.3	2.2	7.7	1.9	8408

Table 4b: Income Gainers/Losers by Household Income deciles (unweighted results)

Individual level per capita non equivalised income-unit income									
	Decrease in $				Increase in $				
	<10	5-10	1-5	none	1-5	5-10	>10	Average	Count
Decile01	-	-	-	98.1	0.2	-	1.7	0.65	844
Decile02	-	-	-	66.3	8.4	2.6	22.7	13.43	838
Decile03	-	-	-	19.7	1.0	7.4	72.0	49.71	842
Decile04	-	-	-	7.4	0.7	0.2	91.7	83.80	840
Decile05	-	-	-	6.2	-	-	93.8	93.01	840
Decile06	-	-	-	9.3	0.5	1.0	89.3	71.52	842
Decile07	-	-	-	57.6	6.0	7.6	28.8	15.20	840
Decile08	-	-	-	95.7	1.2	0.7	2.4	1.33	842
Decile09	-	-	-	98.1	0.7	1.0	0.2	0.12	840
Decile10	-	-	-	97.6	0.7	1.0	0.7	0.18	840
Total	-	-	-	55.6	1.9	2.1	40.3	32.89	8408

The tables clearly show that there are no losers, with a large group of individuals in the lower income deciles experiencing an increase in their income greater than $10 per week after the reform. Table 4a indicates that a substantial change in the average income can be found in

Deciles 2 to 5. Table 4b shows that the substantial change in the case of policy B stretches even further to Deciles 6 and 7. This is consistent with the expected effect of the hypothetical welfare reform since it draws people who are working and earning a low-to-medium income into social security payments.

The results in Tables 5a and 5b show that the income gain is highest for those who are unemployed or employed (that is have an attachment to the labour market), those who have children and those who are younger than 44 years old. The increase in income unit income for unemployed individuals and non-participants may be the result of the own person's unearned income being withdrawn more slowly or because a partner's income is withdrawn more slowly, thus increasing overall income unit income.

Table 5a: Income Gainers/Losers by employment status, number of children and age

Individual level per capita non equivalised income unit income

	Decrease in $				Increase in $				
	<10	5-10	1-5	none	1-5	5-10	>10	Average	Count
Employment Status									
Employed	-	-	-	88.9	0.9	2.1	8.1	2.0	5345.3
Non-part	-	-	-	90.6	1.9	2.4	5.0	1.2	2923.3
Unemplyd	-	-	-	78.1	2.2	4.1	15.6	3.8	299.7
Number of children									
None	-	-	-	90.2	1.4	2.5	5.9	1.5	4432.9
One dep	-	-	-	90.2	1.6	0.8	7.4	1.7	1416.6
Two deps	-	-	-	87.3	0.9	2.3	9.4	2.3	1708.2
Three deps	-	-	-	87.6	1.3	3.1	8.1	2.2	747.4
Four deps	-	-	-	80.4	-	5.4	14.2	3.1	189.7
Five deps	-	-	-	78.8	-	5.6	15.6	3.2	46.4
Six deps	-	-	-	90.0	-	-	10.0	1.8	27.2
Age									
15 to 19	-	-	-	72.4	-	11.1	16.6	5.2	19.5
20 to 24	-	-	-	84.9	0.3	1.3	13.5	3.0	297.9
25 to 29	-	-	-	89.0	0.8	1.5	8.8	2.1	692.9
30 to 34	-	-	-	89.7	0.5	1.8	8.0	1.9	976.8
35 to 39	-	-	-	90.4	0.8	2.2	6.6	1.6	1115.6
40 to 44	-	-	-	86.9	1.5	2.5	9.1	2.5	1086.3
45 to 49	-	-	-	88.6	0.6	2.6	8.2	1.9	1029.7
50 to 54	-	-	-	87.2	1.8	2.7	8.4	2.0	906.6
55 to 59	-	-	-	84.3	3.6	2.8	9.3	2.1	675.8
60 to 64	-	-	-	83.1	3.3	6.1	7.5	2.0	542.2
65 plus	-	-	-	98.3	0.7	0.6	0.4	0.1	1225.1
Total	-	-	-	89.2	1.3	2.3	7.3	1.8	-
Count	-	-	-	7638.6	108.5	196.6	624.6	-	8568.3

Table 5b: Income Gainers/Losers by employment status, number of children and age

Individual level per capita non equivalised income unit income									
	Decrease in $				Increase in $				
	<10	5-10	1-5	none	1-5	5-10	>10	Average	Count
Employment Status									
Employed	-	-	-	54.7	1.8	2.0	41.5	35.6	5345.3
Non-part	-	-	-	58.3	2.1	2.5	37.1	25.8	2923.3
Unemplyd	-	-	-	56.7	3.1	0.2	40.1	35.8	299.7
Number of children									
None	-	-	-	58.4	2.6	2.8	36.2	22.0	4432.9
One dep	-	-	-	54.6	1.2	0.5	43.7	37.0	1416.6
Two deps	-	-	-	54.8	1.1	1.8	42.2	42.7	1708.2
Three deps	-	-	-	48.4	1.5	2.1	48.0	54.9	747.4
Four deps	-	-	-	55.9	2.3	-	41.8	43.0	189.7
Five deps	-	-	-	50.8	-	4.7	44.4	56.7	46.4
Six deps	-	-	-	34.1	-	-	65.9	64.1	27.2
Age									
15 to 19	-	-	-	36.3	-	-	63.7	59.2	19.5
20 to 24	-	-	-	45.0	2.2	1.3	51.5	40.1	297.9
25 to 29	-	-	-	52.1	1.6	1.3	45.0	38.7	692.9
30 to 34	-	-	-	55.4	1.4	1.2	41.9	41.1	976.8
35 to 39	-	-	-	56.1	1.2	1.8	40.8	43.2	1115.6
40 to 44	-	-	-	57.6	0.9	1.9	39.6	37.9	1086.3
45 to 49	-	-	-	56.1	2.5	2.0	39.5	31.3	1029.7
50 to 54	-	-	-	58.1	1.3	2.3	38.3	27.7	906.6
55 to 59	-	-	-	54.1	1.2	1.7	43.0	29.2	675.8
60 to 64	-	-	-	52.7	2.9	2.9	41.5	26.3	542.2
65 plus	-	-	-	61.1	4.0	3.7	31.2	12.8	1225.1
Total	-	-	-	56.0	1.9	2.1	40.0	32.3	-
Count	-	-	-	4799.2	165.3	180.3	3423.5	-	8568.3

3.3. Effect on the Marginal Effective Tax Rate

The Marginal Effective Tax Rate (METR) measures the percentage of additional income that would be paid in taxes or withdrawn from benefit payments. Thus, for example, a METR of 90 per cent means that for one extra dollar of income earned, the individual only keeps 10 cents with the other 90 cents paid in taxes or through loss of benefits.

Table 6 presents the METRs before the welfare reform for couples with and without children, ranging from 0 per cent to over 100 per cent. In this table, only the METRs of income unit heads are represented. For example, in the first row, 27 per cent out of 2216 couples without dependents face a METR of zero per cent. High METR levels can create employment disincentives. Tables 7a and 7b show METRs after the policy change.

The average METR before and after the reform are roughly similar for policy A. There is a clear difference in the change in distribution of METRs between policy A (a shift of around 5 per cent) and policy B (a shift of around 20 per cent). This is as expected when looking at Figures 1 and 3. A much wider range of income is affected by policy B than by policy A. For policy B, the METRs ranging from 40 to 70 per cent increased quite substantially for couples with and without children, with the largest decrease in the 30 to 40 per cent category. This shift is most likely caused by drawing previously ineligible households into the benefit system.

The average METR after implementation of Policy B has increased more than after implementation of Policy A. The increase is higher for couples with children than for couples without children in Policy B, possibly because of the difference in their levels of income. The METR increases because people who previously were ineligible for benefits are eligible after the reform and additional earnings are now withdrawn from the benefits increasing the METR of these individuals. Thus, the implementation of policy B can create work disincentives for a substantial group.

Table 6: Distribution of METRs under March 1998 system (row percentages)

	0	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	>100	Ave	Count
couple	27	-	2	4	23	27	2	6	5	2	2	0	35.14	2216
cpl&dep	12	0	1	4	26	41	0	1	6	6	0	2	45.20	2068
All	20	-	2	4	24	34	1	4	5	4	1	1	40.00	

Table 7a: Distribution of METRs after reform (row percentages)

	0	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	>100	Ave	Count
Couple	27	-	2	4	22	27	1	9	5	2	2	0	35.80	2216
cpl&dep	12	0	1	4	25	41	0	7	1	6	1	2	45.52	2068
All	20	-	2	4	23	34	1	8	3	4	2	1	40.49	-

Table 7b: Distribution of METRs after reform (row percentages)

	0	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	>100	Ave	Count
couple	27	0	1	4	10	29	20	8	1	0	1	0	36.31	2216
cpl&dep	13	0	1	1	10	43	22	8	2	0	0	0	48.82	2068
All	20	-	1	3	10	36	21	8	1	0	1	0	42.35	-

4. Behavioural Simulation Results (MITTS-B)

Policy A is unlikely to affect non-working couples since it only reduces the higher taper rates. These taper rates are only relevant for income over 70 dollars per week. Therefore, this reform is probably not going to induce non-working couples to participate in the labour market. However, policy B may encourage non-working couples to work because they find that their benefits are only withdrawn at 30 per cent instead of 50 per cent in the lower income range (over 30 dollars per week). The case for working couples is different. The likely direction of working couples' labour supply in response to policy A and B is not clear a priori. On the one hand, the increased generosity of social security payments after the reform may induce couples to reduce their labour supply because net income has increased at lower hours of work relative to net income at higher hours. On the other hand, working couples, especially those working a lower number of hours, may take advantage of increased net wage rates after the reform by increasing their labour supply. The net wage rate increases for those who already were eligible before the reform. Those who have only become eligible after the reform face a decreased net wage rate (but still a higher net income).

Duncan and Harris (2002) study the effects of welfare reform on the labour market behaviour of sole parents. They found a positive effect for sole parents as a result of a reduction in the withdrawal rates for Single Parenting Payment and Family Payment on average hours worked and participation in the labour market. Creedy, Kalb and Kew (2001) examine the behavioural impact of reducing all withdrawal rates to 30 per cent for all demographic groups, namely single men and women, couples and sole parents. In their simulation, sole parents are found to have a higher probability of responding to changes in taper rates than other demographic groups, where the effects are quite small. This paper focuses of the behavioural responses to a change in withdrawal rates for married men and women.

In a two-adult household, there is a tendency for individuals to behave in a manner that is consistent with the idea of a main and secondary earner. This is especially so in households with children. In many instances, women are seen as secondary earners while their male partners act as primary earners. Secondary earners place more emphasis on "non-work" time such as taking care of their children, housekeeping, etc. Given these responsibilities, they are more likely to prefer part-time work or non-participation and appear to be relatively flexible when choosing the number of hours worked. Their labour supply is distributed over a wide range of hours. On the contrary, primary earners tend to be less diverse when choosing their hours worked. Their decision seems to be either working full time or not working at all. As a result, they seem less sensitive to changes in social security policies.

Labour supply transition matrices showing the probability of increasing, decreasing or unchanged number of hours worked for married men and women are presented in the first subsection. The extent of changes in work probabilities and predicted hours by gender are discussed in Subsection 4.2. Finally, Subsection 4.3 presents the effect of labour supply responses on the government revenue and expenditure.

4.1. Labour Supply Transition Matrices

Tables 8a, 8b, 9a and 9b show the labour supply transition matrices for married men and women. These matrices show the probability of moving between discrete hours levels resulting from a policy reform. The probabilities on the diagonal represent the individuals who were not induced to vary their number of hours worked. The lower triangular (below the diagonal) represents the individuals who are expected to work less whereas the upper triangular (above the diagonal) represents those expected to work more. For example, the fourth row and first column of Table 8a shows that the probability of moving from 30 to 0 hours worked is 0.1 per cent. The '-' denotes an empty cell. Fewer labour supply points are included for men than for women because the number of men working part-time hours is lower than the number of women. Distinguishing five-hour intervals for men would result in cells with very few observations at the lower end of labour supply.

In the transition matrices for married men and women, the probabilities are mostly concentrated in the lower triangular. Policy A has little effect on labour supply as can be seen from the diagonal elements, which are all close to 100 per cent. The expected labour supply

after introducing policy B shows a higher probability of a change in hours. The difference in the number of men increasing and decreasing their labour supply is not so large. For example, the probability of moving from 0 to 40 hours is 1.6 per cent and for moving from 40 to 0 hours, it is 1.1 per cent (see Table 8b). Post reform, fewer men are non-participants or working 50 hours (compare the last row with the last column of table 8b). These men seem to have moved to the 30-hours category. For married women, the probabilities are much higher in the lower triangular than the upper triangular, indicating that this reform encourages married women to decrease the number of hours they work. The largest proportion of women changing their labour supply are expected to move from positive hours to zero hours (leaving the labour force). As a result, more women do not work or work a low number of part-time hours after the reform. Compared to men, women seem more likely to change their hours following the reform.

Table 8a: Married men's labour supply transitions (row percentages)

From pre to post reform: rows to columns							
	0	10	20	30	40	50	Pre reform
0	99.8	-	0.0	0.1	0.0	0.0	42.0
10	-	100.0	-	-	-	-	1.3
20	-	-	100.0	-	-	-	1.3
30	0.1	-	-	99.9	0.1	-	2.9
40	0.2	0.0	0.0	0.2	99.6	0.0	32.2
50	0.2	0.0	0.0	0.1	0.1	99.5	20.3
Post reform	42.0	1.3	1.3	3.0	32.1	20.2	100.0

Table 8b: Married men's labour supply transitions (row percentages)

From pre to post reform: rows to columns							
	0	10	20	30	40	50	Pre reform
0	96.8	0.0	0.1	0.7	1.6	0.9	42.0
10	-	100.0	-	-	-	-	1.3
20	-	-	100.0	-	-	-	1.3
30	0.3	-	0.0	99.0	0.5	0.2	2.9
40	1.1	0.0	0.2	1.6	96.2	0.9	32.2
50	1.1	0.0	0.2	1.9	3.1	93.7	20.3
Post reform	41.2	1.3	1.4	4.1	32.3	19.7	100.0

Table 9a: Married women's labour supply transitions (row percentages)

From pre to post reform: rows to columns												
	0	5	10	15	20	25	30	35	40	45	50	Pre reform
0	99.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.1
5	-	100.0	-	-	-	-	-	-	-	-	-	1.5
10	-	-	100.0	-	-	-	-	-	-	-	-	2.5
15	0.0	0.0	0.0	99.9	-	-	0.0	0.0	-	-	-	3.7
20	0.2	0.0	0.0	0.0	99.6	0.0	0.0	0.0	0.0	0.0	-	4.9
25	0.2	0.0	0.0	-	0.0	99.7	0.0	0.0	0.0	-	-	4.1
30	0.3	0.0	0.0	0.0	0.0	0.0	99.6	0.0	-	-	-	4.0
35	0.2	0.0	0.0	0.0	0.0	0.0	0.1	99.6	0.0	-	-	5.2
40	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	99.4	0.0	0.0	13.0
45	0.2	0.0	0.0	-	0.0	-	0.0	-	-	99.7	-	2.2
50	0.1	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	99.7	3.8
Post reform	55.2	1.5	2.5	3.7	4.9	4.1	4.0	5.2	12.9	2.2	3.8	100.0

Table 9b: Married women's labour supply transitions (row percentages)

From pre to post reform: rows to columns												
	0	5	10	15	20	25	30	35	40	45	50	Pre reform
0	98.5	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	55.1
5	0.0	100.0	-	0.0	-	-	-	-	-	-	-	1.5
10	0.6	0.0	99.3	0.0	0.0	0.0	-	-	0.0	-	-	2.5
15	2.5	0.1	0.2	96.8	0.1	0.1	0.1	0.1	0.0	0.0	0.0	3.7
20	4.2	0.2	0.4	0.3	93.9	0.3	0.3	0.2	0.1	0.1	0.0	4.9
25	3.1	0.2	0.2	0.3	0.3	95.0	0.3	0.2	0.1	0.1	0.0	4.1
30	5.1	0.3	0.4	0.4	0.4	0.4	92.4	0.2	0.1	0.1	0.0	4.0
35	3.9	0.3	0.3	0.4	0.5	0.5	0.5	93.2	0.3	0.2	0.1	5.2
40	4.9	0.3	0.4	0.5	0.6	0.6	0.6	0.5	91.2	0.2	0.1	13.0
45	3.5	0.2	0.3	0.4	0.5	0.5	0.4	0.2	0.2	93.8	0.1	2.2
50	2.5	0.1	0.2	0.3	0.4	0.4	0.4	0.4	0.2	0.2	94.7	3.8
Post reform	55.9	1.6	2.7	3.9	4.9	4.2	3.9	5.1	12.0	2.2	3.6	100.0

The above information is summarized in Tables 10a and 10b. The first two rows in the Tables show the percentage of people working before and after the reform. The third row shows the percentage of people who move from not working (0 hours worked) before the reform to working after the reform and vice versa for the percentage recorded in the fourth row. The fifth row shows the percentages of workers working more hours whilst those reducing

worked hours are shown in the sixth row. The last row shows the average change in hours worked.

Table 10a: Behavioural responses: change in labour supply

Behavioural Response	Couples:	
	Men	**Women**
workers (%,base)	58.66	45.73
workers (%,reform)	58.62	45.70
non-work-->work (%)	0.06	0.06
work-->non-work (%)	0.10	0.09
workers working more (%)	0.00	0.01
workers working less (%)	0.12	0.06
average hours change	-0.04	-0.02

Table 10b: Behavioural responses: change in labour supply

Behavioural Response	Couples:	
	Men	**Women**
workers (%,base)	58.66	45.73
workers (%,reform)	59.41	44.94
non-work-->work (%)	1.33	0.84
work-->non-work (%)	0.58	1.64
workers working more (%)	0.29	0.19
workers working less (%)	1.61	0.91
average hours change	0.10	-0.50

Table 10a shows that the simulated participation responses for married men and women are similar, but men are somewhat more likely to change the number of hours worked. Overall, the expected changes in labour supply are quite small. This is as expected since the reform only affects the highest taper rate and is thus unlikely to increase labour force participation (that is non-workers moving into work). The percentage of workers going from work to non-work is slightly higher than non-work to work. There are virtually no workers working more hours and there is a positive but small percentage of workers working fewer hours. Altogether, this implies that married men and women seem relatively unresponsive to policy A.

Labour supply behaviour is, however, quite different after the implementation of policy B. For married men, the percentage moving into work is higher than the percentage moving out of the work force. This indicates the reduction of the lowest taper rate seems to provide an

incentive for some non-working men to move into the labour force. The opposite is true for married women, with 1.64 per cent leaving the labour force compared to only 0.84 per cent moving into the work force. These results indicate that for married women the income effect of the policy change seems more important than the substitution effect. Both policies tend to reduce the number of hours worked for those already in employment. However, in policy B the average hours change is positive although close to zero for married men. This indicates that the increased participation and the small proportion that has increased work hours outweigh the reduction of work hours by 2.2 per cent of married men.

The above effects are consistent with effects simulated by other researchers, such as Blundell et al. (2000), Blundell and Hoynes (2000), Eissa and Hoynes (1999). These articles also found negative effects on female labour supply with increased earnings credits and small effects (close to zero) on married men's labour supply.

4.2. Effect of the reforms on work probability and hours worked

The effects of the reform on the extent of the change in probability of working more or less are presented in Tables 11a and 11b by gender. For example, 3 per cent of females experience a decrease in the probability of working between 2 and 10 percentage points. For women, the probability of working less exceeds the probability of working more. The number of men experiencing an increase in their work probability is equal to the number of men experiencing a decrease. As a result of policy A, only a few people are experiencing changes in their work probability. Policy B has a much larger impact, particularly for women. Larger changes occur and a larger number of men and women experience a change.

Table 11a: Change in work probability by gender (row percentages)

	Decrease in %-points				**Increase in %-points**				
Gender	**>50**	**10-50**	**2-10**	**none**	**2-10**	**10-50**	**>50**	**average**	**count**
Female	-	-	3	96	1	-	-	0	4217.4
Male	-	0	2	97	2	-	-	0	4217.4
Total	-	0.0	2.1	96.5	1.4	-	-	0.0	8434.7

Table 11b: Change in work probability by gender (row percentages)

	Decrease in %-points				Increase in %-points				
Gender	**>50**	**10-50**	**2-10**	**none**	**2-10**	**10-50**	**>50**	**average**	**count**
Female	-	7	11	71	9	3	-	-0.8	4217.4
Male	-	0	13	82	1	4	0	0.8	4217.4
Total	-	3.6	11.9	76.5	4.6	3.4	0.1	0.0	8434.7

The predicted changes in the number of hours worked for females and males are shown in Tables 12a and 12b. For example, 1.0 per cent of females are predicted to decrease their preferred hours between 1 to 5 hours. It is clear that the impact of policy B is greater than the impact of policy A as more females and males are changing their predicted hours and the changes are larger as well.

Table 12a: Change in predicted hours by gender (row percentages)

	Decrease in hours				Increase in hours				
Gender	**>10**	**5-10**	**1-5**	**none**	**1-5**	**5-10**	**>10**	**average**	**count**
female	-	-	1.0	98.0	0.0	-	-	0.0	4217.4
male	-	0.0	1.0	98.0	0.0	-	-	0.0	4217.4
Total	-	0.0	1.3	98.3	0.3	-	-	0.0	8434.7

Table 12b: Change in predicted hours by gender (row percentages)

	Decrease in hours				Increase in hours				
Gender	**>10**	**5-10**	**1-5**	**none**	**1-5**	**5-10**	**>10**	**average**	**count**
female	1.0	4.0	10.0	79.0	5.0	1.0	-	-0.5	4217.4
male	0.0	1.0	15.0	80.0	1.0	1.0	3.0	0.1	4217.4
Total	0.4	2.6	12.6	79.2	3.0	0.9	1.4	-0.2	8434.7

4.3. Effect of Behavioural Responses on Government Revenue and Expenditure

The first column under the heading “Pre-Reform” in Tables 13a and 13b gives the amount of income taxes and transfer payments under the March 1998 tax system. These values are weighted to reflect the Australian population. The second column provides an estimate of net change in revenue and expenditure as a result of the policy reform by allowing individuals to respond to the policy changes through changing their number of hours worked. The third column expresses the net change to percentages. The last two columns under the heading “fixed LS” assume fixed labour supply.

Table 13a: Behavioural responses: change in tax and transfer costs

	Pre-Reform	Net change after reform			
		LS		Fixed	
	Abs. Value($m)	Abs. ($m)	%	Abs. ($m)	%
Couple					
Government Revenue					
Income Tax	48005.5	-19.5	0.0	41.3	0.1
Medicare	2955.3	5.3	0.2	10.8	0.4
Total Revenue	50960.8	-14.1	0.0	52.1	0.1
Government Expenditure					
Tax Rebates	2472.7	-43.6	-1.8	-47.0	-1.9
Fam Payment	4001.7	26.7	0.7	11.8	0.3
FTP/FTB	394.1	1.7	0.4	0.0	0.0
Allowances	6717.6	468.9	7.0	461.1	6.9
Pensions	10850.8	0.0	0.0	0.0	0.0
Pharm Allow	117.5	0.3	0.3	0.3	0.3
Rent Allow	524.7	18.6	3.5	15.3	2.9
Total Expenditure	25079.0	471.4	1.9	441.4	1.8
Net Expenditure	**-25881.8**	**485.6**	**-1.9**	**389.3**	**-1.5**

Notes:
LS refers to changes taking into account labour supply.
Fixed refers to changes without accounting for labour supply responses.

The amount of government revenue and expenditure in the pre reform column of Tables 13a and 13b does not match the amount presented in Table 1 exactly because of the discrete nature of modelling and predicting labour supply. For example, for an individual who actually worked 19 hours, all the calculations would be done as if 20 hours were worked in the MITTS-B module. Consequently, the amounts shown in Tables 13a and 13b are less accurate as income taxes and payments are not evaluated at the actual hours but at the closest quintuple for women and the closest decuple for men. In addition, a few observations are dropped in the MITTS-B simulation because of unrealistic wages. Considering these two differences between MITTS-A and MITTS-B, the calculated expenditures and revenues in MITTS-B are close to those calculated in MITTS-A.

For policy A, income tax revenues (Table 13a) are expected to increase by $41.3 million following the reform if labour supply is kept constant. However, income taxes decrease if labour supply responses are taken into account. Allowance costs are somewhat higher if we

take into account the changes in hours worked. This is as expected since the results from Table 10a confirm that some working individuals are moving out of the labour market while others are likely to work less following the reform.

Table 13b: Behavioural responses: change in tax and transfer costs

	Pre-Reform	**Net change after reform**			
		LS		**Fixed**	
	Abs. Value($m)	**Abs. ($m)**	**%**	**Abs. ($m)**	**%**
Couple					
Government Revenue					
Income Tax	48005.5	442.0	0.9	1022.9	2.1
Medicare	2955.3	96.9	3.3	128.4	4.3
Total Revenue	50960.8	539.0	1.1	1151.3	2.3
Government Expenditure					
Tax Rebates	2472.7	-532.4	-21.5	-556.2	-22.5
Fam Payment	4001.7	1942.3	48.5	1652.8	41.3
FTP/FTB	394.1	207.0	52.5	177.6	45.1
Allowances	6717.6	6091.1	90.7	5848.5	87.1
Pensions	10850.8	784.2	7.2	806.6	7.4
Pharm Allow	117.5	10.2	8.7	10.4	8.9
Rent Allow	524.7	281.7	53.7	244.9	46.7
Total Expenditure	25079.0	8784.1	35.0	8184.6	32.6
Net Expenditure	**-25881.8**	**8245.2**	**-31.9**	**7033.3**	**-27.2**

Notes:
LS refers to changes taking into account labour supply.
Fixed refers to changes without accounting for labour supply responses.

In Table 13b, the allowance costs are also higher in the "LS" column than in the "Fixed" column. This is supported by the results from Table 10b that the increase of married men's labour supply seems lower than the decrease for married women, thus only partly offsetting its negative effect. The net change of income tax revenue after the reform is somewhat lower if labour supply responses are taken into account. This is due to the fact that working couples are reducing their number of hours worked and therefore taxable income does not rise as much as it would under fixed labour supply.

These hypothetical reforms demonstrate the potential importance of accounting for employment responses when considering the budgetary implications of a reform.

5. Conclusions

This paper uses the MITTS model to examine the effects of a policy reform on couples' labour supply decisions. Couples of all ages are included in the simulations, although behavioural changes are only calculated for those younger than 65. The MITTS model provides information about the changes to the various components of government revenue and expenditure. It also simulates the potential labour supply responses as a result of a change in the tax and transfer system. The first policy referred to as Policy A involves a reduction of the highest withdrawal rate from 70 to 60 per cent. The second policy referred to as Policy B reduces all withdrawal rates of 70 and 50 per cent to 30 per cent. A comparison is made between the two policies to determine the magnitude of the impact on government expenditure and labour supply responses.

It is important to note that the results of the simulations presented here are predicted values and have uncertainty associated with them. Microsimulation models such as MITTS have their limitations and are based on some assumptions. For example, the behavioural part of MITTS only represents the supply side of the labour market and thus an assumption underlying the MITTS results is that anyone who wants to work can find a job and that everyone can choose the number of hours they wish to work. Another assumption underlying MITTS is that everyone eligible for benefit payments takes up these payments. Finally, a lack of observable characteristics in the SIHC relating to job search, residence requirements and value of assets, which have been discussed in more detail in Section 2 of this paper, means that some eligibility criteria cannot be checked which may result in an overprediction of the number of people who are eligible.

Both policies have the effect of increasing the net income of those who are either partly relying on benefit payments or whose pre-reform income is just above the pre-reform cut-out points and who become eligible for benefits after the reform. This is confirmed in the non-behavioural simulations carried out using the MITTS-A, which show an increase in government expenditure.

The labour supply responses found in this paper are similar to those found in the literature in the UK and the US on the effect of changes in taper rates for income tax credits. Behavioural simulations show that married men and women seem to be relatively unresponsive to policy A. Policy A affects people already in work slightly more than those who are not working before the reform. However, all effects are very small. This implies that minor changes in the higher withdrawal rate do not seem to be effective for couples.

Policy B induces larger behavioural changes. Men are somewhat more likely to participate in the labour market and they work on average slightly more whereas women are more likely to move out of the labour force or reduce their hours of labour supply. The transition matrices suggest that married women are more responsive to a reduction in the taper rate than men. Overall, women are working less on average whereas men tend to work more on average after the reform. These effects are similar to the effects found in the US and the UK.

References

Blundell, R., A. Duncan, J. McCrae and C. Meghir (2000), "The Labour Market Impact of the Working Families' Tax Credit", *Fiscal Studies* 21(1), 75-104.

Blundell, R. and H. Hoynes (2000), "Has 'In-Work' Benefit Reform Helped the Labour Market", preliminary paper prepared for the CEP-IFS-NBER Premier League Meeting, December 8-9, 2000.

Creedy, J., A.S. Duncan, M. Harris, R. Scutella (2002). *Microsimulation Modelling of Taxation and The Labour Market: The Melbourne Institute Tax and Transfer Simulator*. Cheltenham: Edward Elgar.

Creedy, J., Duncan, A.S., Kalb, G. and Kew, H. (2001) The Melbourne Institute Tax and Transfer Simulator (MITTS). Melbourne Institute Working Paper Series, WP No. 16/01, Melbourne Institute of Applied Economic and Social Research, The University of Melbourne.

Creedy, J., Kalb, G. and Kew, H. (2001) The Effects of Flattening the Effective Marginal Rate Structure in Australia: Policy Simulations Using the Melbourne Institute Tax and

Transfer Simulator. Melbourne Institute Working Paper Series, WP No. 10/01, Melbourne Institute of Applied Economic and Social Research, The University of Melbourne (forthcoming in the *Australian Economic Review*).

Duncan, A. and M.N. Harris (2002). Simulating the Effect of Welfare Reforms among Sole Parents in Australia. *Economic Record*, 78, 249-263.

Eissa, N. and H.W. Hoynes (1999), "The earned Income Tax Credit and the Labor Supply of Married Couples", Discussion Paper no. 1194-99, Institute for Research on Poverty, University of Wisconsin-Madison.

Kalb, G. (2002a), "Estimation of Labour Supply Models for Four Separate Groups in the Australian Population", Melbourne Institute Working Paper Series, WP No. 24/02, Melbourne Institute of Applied Economic and Social Research, The University of Melbourne.

Kalb, G. (2002b), "Estimation of Alternative Labour Supply Model Specifications for the Australian Population", Draft report prepared for the Department of Family and Community Services.

Kalb, G. and Scutella. R. (2002), "Estimation of Wage Equations in Australia: Allowing for Censored Observations of Labour Supply", Melbourne Institute Working Paper Series, WP No. 8/02, Melbourne Institute of Applied Economic and Social Research, The University of Melbourne.