Period Equity and Tax Averaging Schemes

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The tax differential caused by variability of taxable income across tax thresholds is estimated for broadacre family farmers using individual taxable income data. Estimates of the tax differential without income averaging are compared with the tax differential under a number of alternative averaging schemes, including the current averaging scheme, modified averaging, block averaging and carry forward tax credits.

Only limited evidence is available to indicate the potential tax differential borne by non-primary producers. The availability of such information would assist future analysis of comparative period inequity of farmers and others in the community subject to variable pre-tax incomes.

1. Introduction

Under a progressive tax schedule and an annual tax assessment period, income variation can increase the total tax paid over time unless there are special provisions. When compared with income that is constant or on a constant trend, income variability across tax thresholds may increase total tax burden. This tax differential is known as period inequity (Jeffery; Curran, Minnis and Freeman).

There are a number of tax instruments specific to primary producers which assist them in smoothing their taxable incomes and thereby reduce their tax burden. These instruments include income averaging, livestock elections, Income Equalisation Deposits (IEDs) and Farm Management Bonds (FMBs).[1] However, previous research provides little evidence of the extent to which primary producers would suffer from this tax differential in the absence of these provisions relative to other taxpayers.

Use of the taxation system to discriminate arbitrarily in favour of some forms of economic activity over others can have important efficiency implications. Individuals will shift labour and mobile capital resources away from the industries with lower post-tax rates of return until these returns are equated. In other words, reducing taxation inequities may result in efficiency gains by changing the pattern of allocation of mobile

resources. The cost of fixed factors (land) are also likely to be affected by tax differentials.

Period inequity also has implications for risk management. In agriculture, as in other industries, income can be stabilised at the cost of lower overall returns. The interaction of a progressive income tax schedule with variable incomes reduces an individual's willingness to accept variable income streams as these income streams attract higher rates of taxation on average. In other words, a tax penalty for fluctuating incomes may shift resources into activities with more stable income streams.

The objective of this research is to examine the level and distribution of additional tax burden that farmers may potentially experience and to draw some limited comparisons with other sectors of the economy. The uncompensated tax differential resulting from a number of averaging schemes is also examined. These schemes include the current income averaging scheme as well as modified averaging, block averaging and carry forward tax credits.

In the first section of the paper the variability of primary producers' income is compared with that of taxpayers deriving their primary source of income from other sectors. Following this are details on the data and method used for the analysis of tax differential resulting from variable incomes and a description of the averaging schemes examined. The results of the analysis, including distributional information across income groups, are then presented.

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[1] IEDs and FMBs are only available to primary producers (Div 16C of the *Income Tax Assessment Act 1936*). A form of tax averaging is available to primary producers (Div 16). A less advantageous form of tax averaging is available to a limited number of other taxpayers (authors, sportspersons, inventors, performing artists and associates, writers and composers) (Div 16A).

2. Comparison of Farm and Non-farm Sectors

Although Australian farm incomes do vary considerably from year to year partly due to large weather variations, other taxpayers may also have a large degree of income variability. For example, people in sports, arts and entertainment businesses may suffer large income changes, as may people moving in and out of employment, those with trending incomes such as younger adults and those near retirement age. Variability of business or taxable income is a necessary but not sufficient condition for period inequity since it is only variability across tax thresholds that is important. For example, individuals with taxable incomes which fluctuate but which always remain within a tax bracket do not experience the tax differential. A brief summary of the available evidence about the degree of income variability for taxpayers in agriculture and other sectors is presented in this section.

2.1 Variability of Business Income

Little evidence is available to indicate the income variability of non-farm sectors of the economy. One early study analysed the income streams of 9000 taxpayers and compared the year-on-year net income variability of primary producers, other businesses and salary and wages earners from 1967-68 to 1970-71 (Commonwealth of Australia 1974). The results are presented in table 1.

It can be seen that the percentage of primary producers experiencing large (over 50 per cent change compared with the previous year) income fluctuations was higher than for the other classifications. However, it should be noted that the number of primary producers (esti-

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Table 1: Income Variability of Different Groups of Taxpayers: 1967-68 to 1970-71

	Relatively Stable Incomes[a] %	Proportion with:	Very Unstable Incomes[b] %
1967-68			
Primary producers	4.9		46.3
Other businesses	29.2		20.6
1968-69			
Primary producers	13.4		52.2
Other businesses	26.9		23.1
1969-70			
Primary producers	13.5		45.6
Other businesses	27.3		22.7
1970-71			
Primary producers	15.6		40.8
Other businesses	25.3		22.7
Salary and wage earners	31.1		17.0

[a] 'Relatively stable' is defined as taxpayers with incomes in the current year within 10 per cent of the previous year.

[b] 'Very unstable' is defined as taxpayers with incomes in the current year varying by more than 50 per cent from the previous year.

Source: Commonwealth of Australia (1974).

mated to be between 100 000 and 150 000 a year) experiencing large income fluctuations was substantially less than the number of salary wage earners (estimated to be between 650 000 and 700 000 a year) experiencing large income fructuations because of the different population sizes (Industries Assistance Commission).

There are several problems with this analysis. The first relates to the use of year-on-year variability over a short time period. Aggregate real farm income in 1970-71 was the lowest in real terms since 1944-45 (Chisholm), and the period surveyed included the wool slump and rural recession of the late 1960s. If incomes have declined sharply because of a major commodity price decline, such variation can be expected, but this level of variability may not continue.

A second problem is that the survey did not examine if there were subgroups within the other classifications which may also experience wide income fluctuations (Industries Assistance Commission). Pos- sible examples include small agribusinesses, the tourism industry, architects, exporters subject to currency fluctuations (Commonwealth of Australia 1990), and women of child- bearing age (Grbich). Further, the survey did not consider the income variability of different agricultural industries. The Industries Assistance Commission cited findings of Motha, Sheales and Saad which showed that variability of gross receipts of different agricultural industries had significant differences.

A third issue is that farm income is not a good indicator of taxable income. At the time the survey was conducted, primary producers could claim 100 per cent tax write-offs for, among other things, clearing land, erection of fences, and construction of buildings for the purposes of conserving fodder. Investment allowances were available for purchase of new plant. Accordingly, capital expenditures could cause significant changes in taxable income.

Finally, the measure of variability used in this study, the percentage change from the previous year, only measures variability over a two year period. This may not give an adequate indication of the underlying income variability, as it will highlight short term variations. A better measure would be the coefficient of variation calculated over the entire period of analysis. The coefficient of variation is defined as the standard deviation divided by the mean.

A similar analysis was made of the taxable incomes of a sample of 455 primary producers obtained for a *Review of the Income Equalisation Deposit Scheme* (Douglas and Davenport). The results are summarised in table 2.

From table 2 it can be seen that the proportion of primary producers with very unstable incomes may be less than that observed in table 1. This could be partly explained by the years sampled. Between 1986-87 and 1989-90, the average taxable income of taxpayers included in the sample increased from $13 357 in

Table 2:   Income Variability for Sample of 455 Primary Producers: 1986-87 to 1989-90

	Proportion with:	
	Relatively Stable Incomes[a] %	Very Unstable Incomes[b] %
1986-87	11	35
1987-88	11	63
1988-89	16	26
1989-90	17	16

[a]   'Relatively stable' is defined as taxpayers with incomes in the current year within 10 per cent of the pervious year.

[b]   'Very unstable' is defined as taxpayers with incomes in the current year varying by more than 50 per cent from the previous year.

Source: Douglas and Davenport (1993).

1985-86 to $33 078 in 1989-90, with the largest increase occurring between 1986-87 and 1987-88.

2.2 Variability of Taxable Income

Data from the Australian Taxation Office (ATO) are presented which suggest that taxable income in other industries varies considerably at an industry level. The variability of the annual average taxable income levels for each group is examined here. The measure of variability used is the coefficient of variation, which is equal to the standard deviation divided by the mean. This gives a relative measure of the degree of variation around the mean. High coefficients of variation imply that incomes of individual farmers fluctuate significantly from their average.

The following statistics are sourced from ATO *Taxation Statistics* for the years 1980-81 to 1991-92 (table 3). Several caveats apply. First, the categories mentioned here were not objectively derived by the ATO, but rather are in most cases what the individual taxpayers or their tax agents considered their business enterprise to be. Main categories (for example, the manufacturing industry) are aggregates of smaller enterprises (for example, metal products, transport, equipment, machinery, textiles, clothing, footwear, etc.). Second, the statistics were calculated from the published tables for taxable individuals, and do not include details from those taxpayers incurring losses or whose income was below the taxable threshold.[2] Third, the sample does not include corporate taxpayers, but is limited to those taxpayers whose primary business structure is a sole trader, partnership or trust.[3] Fourth, the population size of the industries varied over the time period, with some classifications such as primary production and mining having fluctuating population, while others such as health and entertainment show steady growth.

From table 3 it can be seen that the average taxable income of individuals in the mining industry appear to have extremely variable taxable incomes relative to individuals in other sectors. Other industries have similar levels of variability to agricultural industries. However, it must be recalled that high variability of taxable income does not necessarily imply high levels of period inequity. For example, the legal services industry has high variability of taxable income, but as mean income levels are substantially above the top marginal threshold it is unlikely that the legal services

industry has significant problems with this tax differential.

Thus although in aggregate agriculture has relatively high levels of variation of taxable income, variability is also high in some other industries. The usefulness of the ATO taxation statistics for examining period inequity across industries is limited because the tax differential arises from variability in individual taxpayer's taxable income, whereas the data presented in table 3 consider only the variability of an average taxable income within an industry.

3. Tax Averaging Schemes Examined

In this analysis, a number of averaging schemes and their effect on broadacre farmers' levels of period inequity are examined.[4] This section briefly outlines the alternative schemes being examined, and considers adjustment for outstanding tax liabilities and credits at the end of the analysis period.

3.1 Income Averaging

A special form of income averaging is currently available to primary producers (Div 16 of the *Income Tax Assessment Act 1936*).[5] Under this scheme an average tax rate is calculated from the average taxable income over the previous four years and the current year. Tax payable is the product of this average rate and the current year's taxable income, with special shading in

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[2] Primary producers using the averaging system may be subject to tax if their taxable income is below the tax free threshold, but their average income is above the threshold. Conversely, primary producers on averaging whose taxable income exceeds the tax free threshold will not be subject to tax if their average income is below the threshold.

[3] Over 80 per cent of Australian businesses were unincorporated in 1990-91, with agriculture and fisheries enterprises comprising 15 per cent of the total (OECD 1994).

[4] Further research is currently being undertaken at the Australian Bureau of Agricultural and Resource Economics (ABARE) to examine the tax differential under the IED scheme and the interaction between IEDs and averaging.

[5] A different and less advantageous form of tax averaging (Div 16A of the *Income Tax Assessment Act 1936*) is available to a limited number of other taxpayers (including sportspersons, inventors, performing artists and associates, writers and composers).

Table 3:   Summary Statistics of Average Taxable Income for Taxpayers in Various Industry Groupings: 1980-81 to 1991-92[a]

	Average $	Standard deviation $	Coefficient of variation %
Main industry sectors			
Mining	42 600	12 200	28.7
Primary production	29 000	3 100	10.8
Health, education and welfare	50 300	4 900	9.8
Wholesale trade	28 900	2 200	7.5
Finance, insurance, real estate and business services	37 600	2,300	6.2
Entertainment, recreation, restaurants, hotels and personal services	26 200	1 600	6.1
Manufacturing	24 500	1 100	4.3
Retail trade	26 700	900	3.5
All individuals	27 900	700	2.4
Selected industry groups			
Pharmacies	45 000	6 700	14.8
Sheep grazing	32 600	4 500	13.8
Grain growing	30 400	4 100	13.4
Legal services	72 600	9 600	13.2
Hotels and motels	33 500	3 100	9.4
Cattle grazing	33 200	2 500	7.5
Cafes and restaurants	22 500	1 600	7.3

[a]   Statistics calculated over the eleven year time period.

Source: Taxation statistics, Australian Taxation Office, 1980-81 to 1991-92.

provisions to restrict the benefits as off-farm income for the taxpayer exceeds $5000.[6] That is, over time, the tax rate is calculated on a five year moving average of taxable income. This reduces the tax paid over timeon variable incomes by reducing the amount of tax paid at the higher marginal tax rates. Tax that would have been paid on taxable income in the current year is adjusted by paying an averaging rebate when average taxable income is greater than the current taxable income, and imposing a complementary tax when average taxable income is less than the current taxable income.

The income averaging scheme has the property that in low income years, tax paid is higher than under normal rates, while tax paid in high income years is lower than using normal rates. In other words, the current income averaging scheme destabilises after-tax incomes. A

further property of the existing averaging provisions is that when incomes rise at a stable rate, over that time tax paid under averaging is less than with no special provisions. For example, averaging tends to provide unintended tax savings in periods of inflation.

Primary producers may calculate their tax payable either with or without income averaging (s157 of the *Income Tax Assessment Act 1936*). However, if primary producers chooses to opt out of the scheme, they cannot use the scheme again. An estimated 85 per cent of broadacre family farm operators and spouses

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[6]   Under income averaging, the first $5000 earned off-farm by an individual is included in the averaging calculations. For off-farm income above this amount, this eligibility is phased out until off-farm income earned over $10 000 is not eligible to be included under the current income averaging scheme.

were using income averaging in 1993-94. Depending on the taxable income stream of a taxpayer over a particular period of time, it is possible to be worse off under the current income averaging scheme than when not participating in the scheme. For example, this may occur if taxable income for an individual is continually decreasing throughout the analysis period. From the data used in this analysis, it is estimated that 3.4 per cent of broadacre family farm operators and spouses would be worse off if they used the current income averaging scheme over this analysis period.

3.2 Modified Averaging

This scheme, suggested by the National Farmers' Federation (NFF), would operate in a similar way to income averaging, except that any complementary tax would be carried over and offset against future averaging rebates. This formulation would ensure that tax liabilities in years when taxable income was below average were the same as without income averaging, and tax payments would continue to be less than or equal to the case without income averaging in years when taxable income was above average. Thus modified averaging, unlike the current income averaging scheme, acts to stabilise after-tax incomes. Under this scheme, there is the potential for outstanding tax to never be paid. In particular, if taxable income is declining over a period of several years, there is potential for the taxpayer to build up significant tax liabilities. For the purposes of this analysis, off-farm income is treated in the same manner as under the current income averaging scheme.

3.3 Block Averaging

Block averaging is also similar to income averaging, with tax being linked to the average taxable income over a fixed block of years. Under block averaging, adjustment to tax payments is made at the end of each block, instead of at the end of each year. For this analysis a five year block is considered. Tax is assumed to be paid at normal rates for four years, and then in the fifth year either a rebate is paid or extra tax is payable depending on the average taxable income for that block. To make this adjustment, the tax payable on the average taxable income is computed. If more than five times this amount has already been paid over the previous four years, the difference is refunded. Otherwise the difference between total tax on the average taxable income and total tax already paid is due. Block averaging reduces the problem under in-

come averaging of higher tax being paid in low taxable income years.

The form of block averaging examined here is fixed block averaging — adjustment is made on the five year block and then a new block is commenced. Fixed block averaging was in operation in Canada for a number of years. In some circumstances, five years may be seen as a long time to wait for adjustment. This wait could be minimised by making progressive adjustments during the five year period. Earlier examination of moving block averaging indicated that in some circumstances tax payable may be higher than the individual's taxable income (Douglas, R., Economic Services Unit, NSW Agriculture, *pers. comm.*, February 1995). For this reason, no subsequent analysis was carried out on the moving block averaging scheme.

If this scheme was to be implemented, the treatment of off-farm income would need to be considered. For this analysis, income earned by an individual both on and off-farm is used in the averaging calculations. This differs from the averaging schemes described above, where there is a phasing out of eligibility under the scheme for off-farm income.

3.4 Carry Forward Tax Credits

This scheme was developed for the NFF by G. Goucher as a proposal to replace the current income averaging scheme. Under this scheme, taxpayers accumulate credits for unused portions of marginal tax brackets. These credits may be used to reduce the tax paid in future years when taxable income moves into higher tax brackets. At any time, credits may only be accumulated up to the highest level of taxable income previously earned by the individual, and may not exceed ten times the tax bracket. A difficulty with this scheme may arise when tax rates or brackets change. Keeping a record over time for an individual taxpayer of tax credits carried forward at different tax rates are likely to be administratively complex. In particular, this would become more complex when tax rates and brackets were changed. In this report fixed tax rates were applied throughout the analysis period. Again, the treatment of off-farm income under this scheme is an issue needing further consideration. For this analysis, income earned by an individual both on and off-farm is used in the calculations.

4. Estimating Period Inequity in Broadacre Agriculture

The data and method used to examine period inequity in this report are described in this section. As actual comparisons cannot be made between individuals with variable and more stable taxable incomes, we have called our measures 'tax differentials'. These estimates give an indication of levels of period inequity between broadacre family farm operators and spouses compared with hypothetical individuals with perfectly stable real taxable incomes. In this analysis, farm level survey data are used to estimate the level and distribution of the potential tax differential that would be borne by broadacre family farm operators and spouses under the various schemes outlined in the previous section.

4.1 Data Description

ABARE's surveys of broadacre agriculture provide a unique farm level database which integrates detailed estimates of financial and physical information for around 65 per cent of Australian farm businesses. The Australian agricultural and grazing industries survey (AAGIS) is designed and samples selected using the Agricultural Census as the basis of a framework provided by the Australian Bureau of Statistics. Subcommercial properties (based on the estimated value of agricultural operations) are excluded from the sample.[7] Additional information about ABARE's surveys and collection procedures can be found in ABARE (1994).

Calculating taxable income as defined under the *Income Tax Assessment Act 1936* would require data on all sources of income for farmers as individuals and all allowable deductions, including deductions for eligible contributions to superannuation funds, donations to charities and other deductions. AAGIS survey data can be used in this analysis as the data contain farm level information including most receipts and all major deductible expenses.

Although these surveys have been operating annually since 1977-78, farms have participated in the survey for varying lengths of time. Individual farms usually remain in the survey for more than one year, although over time farms are rotated out of the sample. To enable the use of a complete time series in this analysis, spatial smoothing techniques are used which draw on data for neighbouring farms to derive a value for the farm of interest. Spatial smoothing is appropriate in

this case because the incomes on neighbouring farms are spatially correlated. The spatial correlations exist due to neighbouring farms tending to produce similar commodities, being of similar structure and experiencing similar weather conditions. The technique is described in more detail in Kokic, Moon, Wright and Chambers.

Only family farms are included in this analysis. These farms are defined as establishments which use at least 48 working weeks of family labour during the year and typically represent over 90 per cent of the sample in any given year. In this analysis it has been assumed that all taxpayers in the target group are unincorporated. This assumption is quite realistic as a high proportion of Australian farm businesses were unincorporated (OECD 1994). This finding is supported by ABARE's surveys from which it is estimated that at least 93 per cent of broadacre farms were unincorporated in 1992-93. Furthermore, as only family farms are used in the analysis, the degree of incorporation would be even lower.

To test the accuracy of these smoothing techniques, means and variances of the estimated temporal farm level income distributions were aggregated to the regional level. These were compared with average regional temporal means and variances of the raw survey data. In most cases the two estimates of mean and variance corresponded closely. In a few regions there were some differences but these could be explained by the difference in methods used to calculate the variances. For example, the method based on raw survey data loses accuracy because only farms that were in the survey for at least two years could contribute to the estimate of variance. However, in certain cases data from outside the region may have had an impact on the estimates of temporal farm income distributions. The only region where this may be a problem is in the Northern Territory. However, as only family farms were included in this study, most farms in this region have already been excluded.

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[7] The estimated value of agricultural operations (EVAO) cut-off for inclusion in the survey is determined by the Australian Bureau of Statistics through their coverage specification on the Agricultural Census. This cut-off has changed over time. In 1992-93 only farms with an EVAO of $22 500 or greater were included in the sample. For further information, see ABARE (1994) and previous editions.

4.2 Estimating Taxable Income

AAGIS data contain farm level information including all major receipts and deductible expenses including farm business running costs, interest expenses and depreciation. Data from which taxable income is estimated are derived from the farm accounts. These accounts are similar to those submitted by farmers to enable determination of the farm component of their individual taxable income.

Complete farm account information needed to calculate taxable income is currently available from 1980-81 to 1992-93. Information about the partnership allocation of farm income between operator and spouse and off-farm income earned by the operator and spouse is also collected, allowing estimates of taxable income for these individuals to be made. No definitive allocation of taxable income can be made for partners other than the operator and spouse. For this reason, only estimates of the potential tax differential for the operator and spouse are presented.

The estimation of an individual's taxable income involves a number of steps. Firstly, the business income of a farm is calculated by subtracting total farm business expenses from total business returns. These incomes and all other value variables are inflated into 1993-94 dollars. The spatial smoothing techniques described above are then used to estimate business income time series for each farm. Business income in each year is then divided among the partners according to partnership shares. Off-farm income series for the operator and spouse are estimated using expected values from the smoothing technique. Since off-farm incomes are much less variable than farm business income, such an approach should not introduce significant biases when estimating the overall time series of taxable income. Finally, taxable incomes for the operator and spouse are calculated as the sum of their share of business income and income earned off-farm.

The final sample contains taxable income streams over thirteen years between 1980-81 to 1992-93 for 6362 broadacre farm operators and spouses on 3491 farms.

4.3 Measures of Tax Differential

Potential tax differential is defined as the tax paid under the individual's actual taxable income stream minus tax paid assuming the individual had earned the same total amount of taxable income in a perfectly stable income stream over time. This 'flat' base income stream allows an estimate of potential tax differential to be made, but does not make any allowances for what may be a common level of tax differential experienced by taxpayers from other sectors.

In this report, the measure used to compare the various schemes is relative tax differential, which is potential tax differential as a percentage of the total taxable income earned over the analysis period. Calculations were made over a ten year period from 1983-84 to 1992-93, with data from the earlier years being used to initialise the averaging schemes. A discount rate of seven per cent is used in this analysis.

The concept of period inequity implies that the common assessment period for taxation, the financial year, is not a suitable period over which to assess equity (Jeffery; McIntyre). Choice of the financial year as the assessment period is essentially arbitrary — a shorter or longer period might also be appropriate. To examine the sensitivity of the analysis to the measurement period chosen, the analysis was repeated over shorter periods and, for each of these shorter periods, over blocks with different starting years. Shortening the time period tended to decrease estimates of relative tax differential by up to one and a half percentage points. Running the analysis over different block of years altered estimates of relative tax differential by up to two percentage points, with the choice of starting year being more influential for the shorter time periods. Shorter time periods will be more sensitive to peaks and troughs in the levels of incomes and may well be dominated by one good or bad year. That is, shorter periods may not be able to capture the full cycles associated with primary production.

4.4 Outstanding Tax Liabilities and Credits

It should be noted that potential tax differential only measures tax differences up to the end of the ten year analysis period. It does not account for any outstanding tax liabilities or credits remaining at the end of the period. Under the modified averaging scheme a taxpayer may have complementary tax liabilities still to be paid, while in the carry forward tax credit scheme the taxpayer may have tax credits still to be claimed. The value of accumulated tax liabilities and credits at any given point in time varies depending on the preceding years' taxable income pattern. Discounting affects the value of the outstanding tax or credit according to the time the liability is paid or the benefit claimed. It is possible that outstanding tax may be

deferred for a long time or indeed may never be paid, and similarly outstanding credits may never be used.

It is difficult to determine how to account for these outstanding balances. Clearly individuals with higher valued outstanding credits or lower valued outstanding taxes are in a relatively better position at the end of the analysis period than other individuals, other things being equal. However, the credits will only be used and taxes only paid if taxable income reaches a sufficiently high level. For this reason, outstanding balances are reported, but no attempt has been made to adjust the estimates of the tax differential to reflect these balances.

The current income averaging scheme and the modified averaging scheme also have some residual effects beyond the end of the analysis period: the tax payable in the four years after the end of the analysis period will be affected by the taxable incomes from the previous four years. Since valuation of this effect would require forecasts of taxable incomes, this residual effect is not determined in the analysis.

4.5 Tax Rates and Brackets

Estimates are made using constant tax rates and brackets — those applied in 1992-93. It should be noted that changing marginal tax rates may increase the tax differential even when taxable incomes were perfectly constant over time. Historical incomes are adjusted using the consumer price index (CPI) to make them compatible with the current tax brackets.

4.6 Provisional Tax, Medicare Levy and Carry Forward of Losses

Provisional tax is not included in the calculations as it affects the timing of tax payments rather than the total amount of tax paid.[8] As Medicare levy rates have been less than 1.25 per cent of taxable income over the period of the study, they have also been ignored for simplicity. Dependent rebates, medical expenses rebates, charitable gifts, personal superannuation deductions and similar tax concessions are also ignored for the purposes of simplicity. Carry forward of losses is included in the analysis because it affects the amount of tax paid, and hence the level and distribution of period inequity, by ongoing farms.[9] As carry forward of losses is available to all tax payers, it is incorporated into the base income stream.

5. Tax Differential for Broadacre Farmers

In this section, results of the analysis comparing different tax averaging schemes are presented. First a summary of results at the aggregate level are supplied. Following this, distributions of tax differential and the relationship between the tax differential and taxable income levels are examined.

5.1 Aggregate Results

Assuming no special provisions and constant tax rates and brackets, the average potential tax differential for broadacre family farm operators and spouses is estimated to be $1140 per person a year over the ten year simulation period (table 4). This represents 4.4 per cent of average taxable income. The current income averaging scheme is estimated to reduce the potential tax differential by $700 a year on average to $440 per person a year. Of the schemes examined, the modified averaging scheme is estimated to result in the lowest level of uncompensated tax differential at $320 per taxpayer a year.

The carry forward tax credits scheme is estimated to result in the highest average unadjusted tax differential of the schemes examined. Due to the sizable value of outstanding credits, it is difficult to assess this scheme since the true impact of this outstanding balance depends on the amount of and when the outstanding credits are used. Similarly, although the modified averaging scheme has the lowest level of the unadjusted tax differential, there are still outstanding taxes being carried forward into the future. The magnitude of these taxes is small on average compared to the magnitude of outstanding credits under the carry forward tax credits scheme.

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[8] Upon lodgement, a provisional tax for the current financial year is imposed based on the taxpayers taxable income in the previous year incremented by the provisional tax uplift factor of 8 per cent. Taxpayers have an option to have this tax varied by self assessing their provisional income. The penalties for underestimating provisional income are high.

[9] The OECD reports that the tax systems of all member countries provide mechanisms for transferring losses inter-temporally (OECD 1993).

Table 4: **Potential and Relative Tax Differential : For broadacre family farm operators and spouses, average per individual a year, in 1993-94 dollars**

	Unadjusted potential tax differential $	Unadjusted relative tax differential %	Outstanding tax liability $
No special provisions	1,140	4.4	0
Averaging schemes			
Income averaging	440	1.7	0
Modified averaging	320	1.2	60
Block averaging	380	1.5	0
Carry forward tax credits	670	2.6	−780

Simulation period = 1983-84 to 1992-93
Unadjusted relative tax differential = potential tax differential as a percentage of taxable income.

Apart from the carry forward tax credits scheme, there appears to be little differences in unadjusted relative tax differential between the schemes examined, with the corresponding levels estimated to range between 1.2 and 1.7 per cent.

5.2 Distribution of Tax Differential

The distributions of adjusted relative tax differential under different schemes are summarised in boxplots in figure 1.

The white line in the middle of the box indicates the median (or centre) of the distribution. The upper and lower ends of the box indicate the upper and lower quartiles. Thus 25 per cent of the observations are below and 25 per cent are above the box. The distance between the upper and lower quartiles is the interquartile range, which is a measure of the spread of the distribution. Fifty per cent of the observations lie within the box. Therefore, the middle half of the data is relatively close to the median when the interquartile range is small. Ten per cent of the data lie beyond each dashed line. The 10 per cent of observations at each end of the distribution are not plotted on these graphs to allow closer examination of the middle 80 per cent of observations.

From figure 1, it estimated that the middle 50 per cent of individuals would have relative tax differential between 3 and just over 6 per cent of taxable income if no special schemes aimed at reducing the tax differential were available. The distributions of unadjusted

relative tax differential shown do not differ greatly between income, block and modified averaging. It is estimated that these three schemes all reduce unadjusted relative tax differential for the middle 50 per cent of individuals to below 3 per cent. The estimated distribution for carry forward tax credits does not reduce unadjusted relative tax differential to the same degree as the other schemes examined, nor is the spread of the distribution as low.
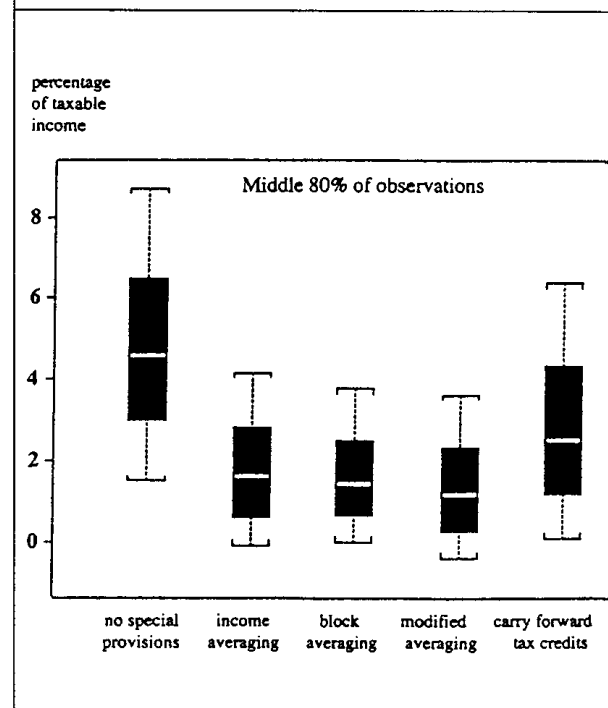

Figure 1: Unadjusted Relative Tax Differential

Table 5:   Unadjusted Relative Tax Differential, by Taxable Income: For broadacre family farm operators and spouses, average per individual per year, in 1993-94 dollars

	Taxable income groups					
	Under $5,400 %	$5,400– $15,000 %	$15,000– $20,700 %	$20,700– $36,000 %	$36,000– $50,000 %	Over $50,000 %
No special provisions	7.2	5.4	5.3	4.5	2.5	0.6
Averaging schemes						
Income averaging	3.4	1.9	2.0	1.9	1.0	–0.1
Modified averaging	2.9	1.4	1.5	1.4	0.6	–0.4
Block averaging	2.6	1.8	1.7	1.6	0.7	–0.2
Carry forward tax credits	5.0	3.4	3.1	2.7	1.2	0.0

Simulation period = 1983-84 to 1992-93. Unadjusted relative tax differential = potential tax differential as a percentage of taxable income.

5.3 Relationship of the Tax Differential to Taxable Income Level

The unadjusted relative tax differential by taxable income groups is shown in table 5. These groups are based on the taxable income brackets as set out in the 1993-94 taxation schedule. An individual was assigned to a group based on their average taxable income over the ten year period examined.

The magnitude of the outstanding tax liabilities under modified averaging ranges from 0.1 to 0.3 per cent of taxable income, with the distribution being fairly even across taxable income groups. In contrast, the distribution of outstanding tax credits under the carry forward tax credits scheme at the end of the period is skewed, with taxpayers in the lower income groups having much larger outstanding credits in relative terms than those in higher income groups. Since credits are accumulated up to the highest taxable income previously earned, if a taxpayer has one unusually good income year, but income is normally low, credits will tend to build up. Unless the average taxable income of taxpayers in the lower taxable income groups increases by a substantial amount, the full value of these credits may not be used.

Block averaging results in the most even distribution of relative tax differential across taxable income groups. This is highlighted by block averaging having the lowest difference between the unadjusted relative

tax differential for the lowest and highest income groups — 2.8 per cent. In contrast, this difference is 3.5 per cent for the current income averaging scheme, and 5 per cent for carry forward tax credits.

6. Conclusions

Assuming constant tax rates and brackets it is estimated that broadacre family farm operators and spouses would face an additional potential tax burden of 4.4 per cent of taxable income on average if there was no scheme available to reduce the tax differential. It is estimated that the current income averaging scheme reduces potential tax differential for these taxpayers by an average of $700 per person a year to 1.7 per cent of taxable income. Block averaging compares favourably with the other schemes examined in terms of adjusted relative tax differential. This scheme is also estimated to have the most uniform distribution of uncompensated tax differential across taxable income groups. It is difficult to evaluate the carry forward tax credits scheme due to the large number of credits remaining at the end of the analysis period.

Excluding carry forward tax credits, the difference between the estimated unadjusted relative tax differential from the current scheme and the alternative schemes examined is small — around 0.5 per cent on average. On this basis, there may be no reason to change the current taxation provisions aimed at reducing the tax differential. However, some of these alter-

nate schemes have properties that may be preferred to current schemes, such as stabilising post-tax income and being less regressive in their distribution of tax savings. In addition the current income averaging scheme breeches the efficiency criteria by providing differing marginal tax rates for different sources of income.

Caution must be exercised in interpreting the results presented. First, estimates are made assuming current tax rates and brackets. Second, the analysis is static and only relates to the period studied. Third, no account is taken of the extent to which primary producers may have used other measures to reduce variability in taxable income, either by use of tax provisions such as livestock elections, or by altering the timing of receipts and expenditure. Fourth, no account is taken of the behavioural changes that may result from removal of special taxation provisions. Fifth, as noted earlier, a flat base income stream is used for comparison resulting in measures of potential tax differential, with no account given to the variability of taxable incomes that may be faced by other sectors of the economy.

Several important questions remain unanswered. Perhaps the most important is the extent of period inequity experienced by other taxpayers. On the basis of the evidence in this report, it cannot be concluded that individuals deriving their primary source of income from agricultural businesses would have unique taxation burdens due to the tax differential relative to other taxpayers if special provisions were to be removed. This would depend on the full range of tax concessions available, and the level of the tax differential experienced by other individuals. The availability of such information would assist future analysis of comparative period inequity of farmers and others in the community subject to variable pre-tax incomes.

In addition, there is no evidence available to judge to what extent farmers may have used other measures to reduce variability in taxable income. For example, livestock producers have several elections available to spread the profits from the forced disposal of livestock over time.

Possible methods of removing or alleviating the tax differential include changing from progressive to proportional tax rates, changes to the assessment period, methods of moving income intertemporally (for example, superannuation and Income Equalisation Deposits), or the introduction of tax averaging measures. A

decision to remove or alleviate the tax differential should only be made after a full assessment of the impact of all taxation provisions has been made.

In order to be able to fully comprehend the effects of these schemes, several alternative assumptions appear to be especially important issues for further research. First, as this analysis has used constant tax rates and brackets, the effect of varying tax rates and brackets throughout the analysis period needs to be analysed.

Second, the effects of inflation have not yet been determined. There are a number of situations where these further analyses could be important. In particular, when taxable incomes are rising and tax rates are falling, there could be substantial changes in period inequity.

Third, the analysis for this report has not assessed the impact that these schemes may have on investment decisions, and particularly the timing of investments. Favourable schemes from this analysis need to be run in conjunction with the depreciation analysis currently being conducted at ABARE. Fourth, the interaction between these favourable schemes and IED schemes needs to be assessed. Finally, the interaction between any favourable schemes and provisional tax needs to be determined. Farm level analysis is needed to assess whether any unintended side-effects exist.

If an alternate scheme was to be considered several further issues would need to be considered. These include the administrative complexity of the scheme, the potential for tax avoidance and the treatment of off-farm income.

This report has been able to estimate period inequity under a number of possible taxation schemes, assuming constant tax rates and brackets, and no inflation. However, prior to any policy changes being considered, further analysis is required to identify any unintended side-effects.

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