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## 5 Model estimation results

The results of the estimation of the four models described in chapter 3, for both specifications (reduced form and structural specification — chapter 4), are presented in this chapter. Comparison of the estimates allows the validity of various assumptions about labour supply decisions to be tested. Particular focus is given to the estimate for the lagged dependent variable, which measures state dependence of labour supply.

Moving from Model I to Model IV involves a gradual relaxation of the assumptions surrounding the estimation of the labour supply decision and requires additional parameters to be estimated. The significance of these additional parameters provides a guide as to whether the assumptions implied in the previous model hold, and therefore, whether the previous model is correctly specified. For example in Model II, unobserved heterogeneity (random effects) is introduced and the lagged dependent variable is treated as endogenous (by simultaneously estimating the dynamic model and the initial condition equation). The significance of the random effects term can be used to test the validity of the assumption made in Model I that unobserved heterogeneity influences labour supply. If the random effects term is found to be significant Model I is misspecified, and the parameter estimates from this model should be biased.

Moving from Model II to Model III, unobserved individual effects are allowed to be correlated with observed time variant variables through including the means of the variables in the model. If the coefficients on the mean variables are jointly statistically significant, the random effects assumption of Model II is not warranted in which case Model II is misspecified, again raising concerns of estimation bias.

Similarly, moving from Model III to Model IV allows for serial correlation of transitory errors. If the correlation parameter is statistically significant, the assumption of no serial correlation of transitory error is unwarranted, suggesting that Model III will be misspecified compared with Model IV.

Before comparing and discussing the model estimation results, it is useful to first illustrate how the coefficient estimates should be interpreted.

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## 5.1 Interpretation of the coefficient estimates

As illustrated in chapter 3, the Tobit model is formulated based on latent working hours  $y^*$ . Since  $E[y^* | X] = X'\beta$  in Tobit models,  $\beta_k (= \frac{\partial E[y^* | X]}{\partial X_k})$  measures the marginal effect of the variable  $X_k$  on latent working hours. An advantage of the Tobit model as a method of estimating a censored distribution, is that it allows examining the partial effect of observed variables on alternative outcomes of interest (Wooldridge 2002), such as:

- (a)  $Prob(y^* > 0 | X) = \Phi(X'\beta / \delta)$
- (b)  $E(y | X) = \Phi(X'\beta / \delta)(X'\beta) + \delta\phi(X'\beta / \delta)$
- (c)  $E(y | X, y > 0) = X'\beta + \delta[\phi(X'\beta / \delta) / \Phi(X'\beta / \delta)]$ .

In the above equations,  $\delta$  refers to the square root of the variance of the (composite) error term in the model. Equation (a) measures the probability of being employed (those with positive working hours); (b) measures the expected value of observed working hours (including both zero and positive hours); and (c) is the expected working hours of those who are employed (those with positive hours). Following these equations and by using the coefficient estimates, the marginal effects on each of the three outcomes can be calculated. Since latent working hours are not observed for those who do not work, the marginal effects on the three outcomes described in (a) to (c) are more meaningful than the coefficient estimates themselves.

## 5.2 Estimation results

In the following two sections the marginal effect estimates on the outcomes depicted in (a)  $Prob(y^* > 0 | X)$  and (b)  $E[y | X]$ , along with the coefficient estimates, are presented. Instead of calculating the marginal effects at the mean of the observed variables, the marginal effects for each observation in the sample are calculated with the mean of the individual marginal effects presented. The resulting marginal effects are often called mean marginal effects (MME).<sup>1</sup> To further facilitate inference, the standard errors of the MME estimates are calculated using the delta method (Greene 2000). The estimation results are presented separately for the reduced form and structural specifications of the four models.

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<sup>1</sup> The marginal effects evaluated at the mean of the sample are often called the marginal effects at the mean (MEM). The MME estimates are preferred to MEMs since no persons in the sample take the mean values of the variables.

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## Reduced form estimation

Table 5.1 presents the coefficient and MME estimates of the reduced form specification of the four models. The estimates of the random effects parameters in Models II to IV are all strongly significant, suggesting that ignoring unobserved individual heterogeneity (as in Model I) would lead to misspecification bias. In Models III and IV, the estimates of the parameters of the mean variables used to explain the random effects are jointly significant at the 5 per cent level, although they are not all individually significant. This indicates that a random effects assumption on unobserved individual effects, as assumed in Model II, may not hold and that a fixed effects approximation is better. In Model IV the estimate on serial correlation is strongly significant, suggesting that ignoring the correlation as in Models I to III would lead to a biased estimate on state dependence and possibly other control variables. All these together suggest that Model IV should be the preferred model among the four.

### *Evidence on state persistence*

In the first three models the coefficient and MME estimates for lagged working hours are positive, suggesting positive state dependence of labour supply for married women. However, the estimate on lagged working hours from the preferred model (Model IV) is insignificant. This, together with the positive and significant estimate for the correlation of transitory error, suggests that the evidence of state dependence inferred from Models I to III is largely due to positive correlation of transitory errors, and thus is spurious. That is, while state dependence is observed in the sample, it is a result of a range of unobserved transitory influences such as accumulation (loss) of human capital associated with the employment (unemployment) state.

Comparing the MME estimates between the models, the pooled model (Model I) produces the largest effect for lagged working hours (and thus the largest state dependence estimate). From this model, an additional hour worked in the previous year increases the probability of being employed in the current year by 1.2 percentage points, and increases current working hours by 0.69. The corresponding estimates from Model II are 0.46 percentage point and 0.27 respectively. The estimates from the correlated random effect model (Model III) are very similar to the estimates from Model II in terms of the marginal effects. The reduction of the MME estimate for state dependence from Model I to Models II and III suggests that unobserved individual effects play an important role in inter-temporal persistence of a married woman's labour supply.

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### *Evidence on non-labour income*

The effect of permanent non-labour income (as measured by the mean of non-labour income) on a married woman's labour supply is significant and negative. Transitory change in non-labour income (as measured by the deviation from mean of non-labour income), while having an expected negative sign, is not significant. These estimates suggest that permanent non-labour income, rather than the transitory non-labour income, has the greatest effect on labour supply.<sup>2</sup> The MME estimates from the preferred model (Model IV) indicate that a \$10 000 increase in a woman's permanent non-labour income would reduce the probability of her being employed by 0.75 percentage point and reduce working hours by 0.45 hour. To put these estimates in context, the mean non-labour income of the women in the sample is about \$58 000. Therefore, a woman who has permanent non-labour income at the sample mean would have a probability of being employed that is about 4.4 percentage points lower and working hours that are 2.6 hours less, compared with a woman without any non-labour income.

Evaluated at the sample mean, the elasticity of working hours with respect to permanent non-labour income is -0.12, and the elasticity of the probability of being employed is -0.06.<sup>3</sup> Comparing the estimates from the other three models, we see that the MME estimates from Model I for both working hours and the probability of being employed are less than a third of those estimated from Model IV. The estimates from Models II and III fall in between those of Models I and IV. That is, failure to adjust for unobserved heterogeneity leads to an underestimation of the importance of non-labour income on labour supply of married women.

### *Evidence on the effect of age*

Age also appears to influence the labour supply of married women. Note that the reference age group refers to those aged 26-35 years. While the coefficient estimates on the different age cohorts are not all individually statistically significant, they are jointly significant at the 1 per cent level in all the four models. The estimates from the preferred model indicate that, all else equal, older women tend to supply less labour than younger ones. For example, the MME estimates of the probability of being employed show that compared with women aged 26-35

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<sup>2</sup> The insignificance of transitory non-labour income may also be due to measurement errors in non-labour income. Measurement error leads to the estimate to be biased towards zeros. If non-labour income is measured with errors, the errors are more likely to be reflected in the deviation from mean than the mean itself.

<sup>3</sup> The sample mean of non-labour income is \$58 000; the sample mean of working hours is 21.61; and the sample mean of the probability of employment is 0.71.

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years, those aged 46-55 years have a probability of being employed that is 2.5 percentage points lower, with the probability of being employed for those aged 56 and over 11.2 percentage points lower. For observed working hours, compared to the 26-35 years age group, the MME estimates show that those aged 46-55 years are expected to work 1.5 hours less and those aged 56 and over 6 hours less. The estimates from Model III are qualitatively similar to those from Model IV, but the MME estimates are slightly smaller. The estimate on the age dummy aged 36-45 in Model I has an opposite sign to that from Model IV, and it is significant at the 10 per cent level. For the two older age groups, the MME estimates in Model I are also much smaller than those in Model IV, indicating that the pooled model might have provided misleading inferences regarding the effect of age alone on a woman's labour supply.

#### *Evidence on the effect of education*

As with other models of labour supply, education is found to have a significant effect (all variables in all models significant at the 1 per cent level). For the education variables, the reference group is those who did not complete year 12. In general the higher the education level, the greater is the labour supply. Focusing on the preferred model, the probability of being employed for those married women who completed year 12 is 10.1 percentage points higher compared to those who did not complete year 12. For other education levels the effect is also significant, with the probability of being employed 8.9 percentage points higher for those with a certificate; 14.3 percentage points higher for those with a diploma; and 20.7 percentage points higher for those with a degree compared to those married women who did not complete year 12.

As with the probability of being employed, increases education levels increase working hours. Those married women who completed year 12 are expected to work 5.1 hours more per week than those who did not, those with a certificate 4.4 hours more, diploma 7.7 hours more and degree 12.9 hours more. The corresponding MME estimates from the pooled model (Model I) are much smaller than those from Model IV. For example, the MME estimate for the degree variable on observed working hours in Model I is less than one fourth of that from Model IV. The MME estimates between Models II and III are similar, but both slightly smaller than those from Model IV.

#### *Evidence on the effect of health*

The specification of the health variables differed in Models III and IV compared with models I and II and thus may not be directly comparable. Despite this, the

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coefficient estimates in all the four models are significant and have the same sign. As expected, the results indicate that having a health condition reduces a married woman's labour supply.

In models III and IV, both the mean of health (over the six year data period for an individual) and its actual value are used, with only the actual value used in Models I and II. The estimate on mean health conditions can be interpreted as the effect of a woman's permanent health status on labour supply, while the estimate on the actual value can be seen as the effect of temporary health changes. The results of the preferred model indicates that a 'temporary' health deterioration (that is, a change from no condition to having a conditions) reduces the probability of being employed by 1.4 percentage points, and reduces working hours by 0.8.<sup>4</sup>

### *Evidence on the effect of young children*

As with other studies of labour supply, the impact of children, particularly young children, is found to be significant. Similar to the approach used to measure the effect of health status, the variables used to measure the influence of children vary between Models I and II and Models III and IV. The mean of the child variables were included in Models III and IV to account for correlation of observed variables and unobserved individual effects. Consequently, the MME estimates on these variables from Models III and IV cannot be compared with those from Models I and II.

Despite lack of comparability in results across the models, the coefficient estimates from all the four models show that children, particularly younger ones, have a negative effect on labour supply of married women. In all the four models, the estimates on the variables 'child 0-2' and 'child 3-5' are strongly significant. The MME estimates from the preferred model show that an additional child under two years would reduce the probability of being employed by 16.3 percentage points and reduce expected working hours by 9.7. An additional child aged 3-5 reduces the probability of being employed by 6.6 percentage points and reduces working hours by 3.9. Having an additional child aged 6-17 is also found to have a negative effect in the preferred model, but the estimate is statistically insignificant.

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<sup>4</sup> For the mean health variable, the MMEs was calculated by treating it as a continuous variable. While this may not be appropriate since the health condition variable is a dummy variable, there are no better options for calculating the MME for the mean variable. Without emphasis on the MME estimate of the mean health variable, the coefficient does suggest that permanent health might have a much larger impact on labour supply than temporary health deterioration.

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### *Evidence on the effect of country of birth*

All the models indicate that labour supply of overseas born women is lower than those born in Australia, but only the estimate for immigrants from non-English speaking countries is significantly lower (the omitted group for this variable refers to those women born in Australia). The MME estimates from the preferred model show that compared with Australian born women, the probability of those who immigrated from non-English speaking countries being employed is 7.4 percentage points lower, and working hours are expected to be 4 hours less. While this may be due to differences in cultural preferences, language difficulty is another possible explanation. It could also be caused by discrimination in employment and/or wages. The MME estimates from the other models are smaller than those from Model IV. In particular, the MME estimates from Model I are the smallest among all the four models, suggesting that standard estimation approaches may significantly underestimate this effect.

Living in a capital city is not found to have a significant effect on labour supply in any of the four models. Local unemployment has a positive sign, but it is also insignificant in all of the models.<sup>5</sup>

The estimates on the wave/year dummies indicate that women appear to supply more labour in the later years than in the earlier years, perhaps reflecting the booming of the economy during the period examined, and the general increasing trend of female labour supply.

### **Structural form estimation**

The estimation results for the structural form specification are presented in table 5.2. As for the reduced form specification, both unobserved heterogeneity and serial correlation of transitory error were found to have a significant effect, leading to the conclusion that Model IV was once again the preferred model.

The results for state dependence are also as observed for the reduced form specification — there is no evidence of state dependence of labour supply once

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<sup>5</sup> In theory the effect of the unemployment rate on married women's labour supply is ambiguous. On the one hand increases in the unemployment rate may reduce married women's labour supply through, for example, reducing wage offers. On the other hand, worsening labour market conditions may increase labour supply of married women as higher unemployment rates increase uncertainty of family income, an 'added worker' effect. This may explain why the unemployment rate variable is insignificant in the model. In addition, the unemployment rate is a measure at the ABS major statistical region level. As such, it may not reflect the labour market conditions an individual actually faces. This may be another reason for the insignificance.

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observed and unobserved heterogeneity and serially correlated transitory shocks to labour supply are controlled for. The MME estimates of the lagged working hours variable on both the probability of being employed and observed working hours are very similar in the reduced form and structural specifications.

### *Evidence of the effect of own-wages*

The structural form specification included a woman's own wage in two forms — a mean measure to represent permanent earnings capacity, and a deviation from the mean to measure transitory wage changes. The measure of a woman's permanent earning capacity is found to be significant in the preferred model (Model IV). The sign indicates that an increase in the mean of a woman's wages increases her labour supply. That is, for married Australian women the substitution effect of permanent wages dominates the income effect. The MME estimates show that a \$10 increase in a woman's mean (hourly) wage raises the probability of her being employed by 6.5 percentage points, and raises her expected working week by 3.8 hours.

Evaluated at the sample mean, the estimates for mean wages imply an elasticity of a woman's working hours with respect to her mean wages of 0.29, and an elasticity of the probability of being employed of 0.15.<sup>6</sup> The other three models suggest that these elasticities are smaller. In particular, the MME estimate from Model I is less than half the estimate from Model IV. For the other three models, the estimate on the deviation of wages is also significant and positive, but the size of the effect of transitory wages is much smaller than that of mean wages.

### *Evidence of the effect of the partner's wages and working hours*

Looking at the wages of a woman's partner, the results show that both the mean and the deviation of his wages are significant and negative. This indicates that both permanent and transitory earning capacities of a woman's partner have a negative effect on her labour supply. The MME estimates from our preferred model indicate that a \$10 increase in a partner's permanent wages reduces the probability of the woman being employed by 2.9 percentage points, and reduces her working hours by 1.7. Evaluated at the sample mean, the cross-elasticity of working hours of a woman with respect to her partner's permanent wages is -0.18, and the elasticity of the probability of the woman being employed is -0.09. The effects of transitory wages of the partner are statistically significant but much smaller in size than a partner's permanent wages. The estimated effects from the pooled model (Model I) are much

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<sup>6</sup> The sample mean of women's wages is \$16.54; the sample mean of working hours is 21.61; and the sample proportion employed 71.08 per cent.

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smaller than those from our preferred model, particularly for the partner's mean wage variable. The estimates from Models II and III fall in between those of Model I and Model IV.

Along with examining the effect of a partner's income, the effect of his working hours was also examined to test whether there was any complementarity in a couples labour supply. A partner's working hours, measured as working hours divided by 10, and its square (to capture possible non-linear effects) were added to all models. The results indicate some complementarity in labour supply, however, the square of working hours is only significant in the pooled model (Model I) and is found insignificant when unobserved heterogeneity is controlled (Models II to IV) suggesting the relationship is linear. The MME estimates from the preferred model (Model IV) show that a 10 hour increase in a partner's working hours raises the probability of a woman being employed by 1.4 percentage points, and raises their expected working hours by 0.83. The estimated effects from the other three models are larger than that from Model IV. The MME estimate from Model I is the largest.

There are a range of possible reasons to explain the observed complementarity in labour supply. One reason relates to leisure time. Partners may tend to share their leisure time, or they may share similar preferences between work and leisure (due to the 'marriage sorting process' which may lead to individuals with similar preferences being 'paired'). However, the exact explanations warrant further investigation.

In the structural specification, a woman's non-labour income was treated differently to the reduced form specification as it did not include her partner's wage. However, despite this difference the qualitative effect on labour supply was found to be similar. Permanent family non-labour income that has a significant negative effect on the labour supply of married women. For example, estimates from the preferred model (Model IV) show that a \$10 000 increase in permanent family non-labour income reduces the probability of a woman being employed by 0.9 percentage points, and reduces her working week by a 0.5 hours. The MME estimates from the other three models are smaller, with those from Model I being the smallest.

The estimates for all other variables in the structural specification are remarkably similar to those estimated from the reduced form specification with the exception of the education variables. The effect of education was found to be much smaller in the structural specification than in the reduced form specification. However, this was expected since education is the most important determinant of wages which are also included in the structural specification. The small change in the estimated effects of the other variables included in both the specifications suggests relatively little

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indirect effect of those variables on a woman's labour supply through their effect on wages.

There are a range of possible reasons to explain the observed complementarity in a married couple's labour supply. One reason relates to leisure time. Partners may tend to share their leisure time, or they may share similar preferences between work and leisure (due to the 'marriage sorting process' which may lead to individuals with similar preferences being 'paired'). However, the exact explanations warrant further investigation.

In the structural specification, non-labour income represents family non-labour income (for the woman and her partner). In the reduced form specification a woman's non-labour income was treated differently to the reduced form specification as it did not include her partner's earnings. However, despite this difference the qualitative effect on labour supply was found to be similar. Permanent family non-labour income is found to have a significant negative effect on the labour supply of married women. For example, estimates from the preferred model (Model IV) show that a \$10 000 increase in permanent family non-labour income reduces the probability of a woman being employed by 0.9 percentage points, and reduces her working week by a 0.5 hours. The MME estimates from the other three models are smaller, with those from Model I being the smallest.

The estimates for all other variables in the structural specification are remarkably similar to those estimated from the reduced form specification with the exception of the education variables. The effect of education was found to be much smaller in the structural specification than in the reduced form specification. However, this was expected since education is the most important determinant of wages which are also included in the structural specification. The small change in the estimated effects of the other variables included in both the specifications suggests relatively little indirect effect of those variables on a woman's labour supply through their effect on wages.

**Table 5.1 Coefficient and MME estimates of the reduced form specification**

	Model I: Pooled Tobit		Model II: RE Tobit		Model III: Cor. RE Tobit		Model IV: AR. Cor. RE Tobit			
	$E(Y^* x)$	$Pr(Y^*>0 x)$	$E(Y^* x)$	$Pr(Y^*>0 x)$	$E(Y^* x)$	$Pr(Y^*>0 x)$	$E(Y^* x)$	$Pr(Y^*>0 x)$		
Lagged hours	0.9013 <sup>C</sup>	0.0122 <sup>C</sup>	0.6919 <sup>C</sup>	0.0046 <sup>C</sup>	0.2712 <sup>C</sup>	0.0045 <sup>C</sup>	0.2639 <sup>C</sup>	0.0069	0.0001	0.0052
s.e.	0.0103	0.0001	0.0076	0.0002	0.0102	0.0002	0.0101	0.0321	0.0004	0.0242
Non-labour income: deviation	-0.0230	-0.0003	-0.0177	-0.0004	-0.0227	-0.0004	-0.0233	-0.0268	-0.0003	-0.0201
s.e.	0.0411	0.0006	0.0316	0.0004	0.0251	0.0004	0.0248	0.0296	0.0004	0.0223
Non-labour income: mean	-0.1692 <sup>C</sup>	-0.0023 <sup>C</sup>	-0.1299 <sup>C</sup>	-0.0058 <sup>C</sup>	-0.3420 <sup>C</sup>	-0.0061 <sup>C</sup>	-0.3617 <sup>C</sup>	-0.5951 <sup>C</sup>	-0.0075 <sup>C</sup>	-0.4476 <sup>C</sup>
s.e.	0.0418	0.0006	0.0321	0.0014	0.0806	0.0013	0.0790	0.1342	0.0017	0.1006
Aged 18-25	2.2506	0.0298	1.7719 <sup>a</sup>	0.0345	2.3036 <sup>a</sup>	0.0347 <sup>a</sup>	2.4258 <sup>a</sup>	2.6531	0.0305	2.0941
s.e.	1.5905	0.0205	1.0684	0.0215	1.2161	0.0209	1.2665	2.3134	0.0254	1.4144
Aged 36-45	0.9820 <sup>a</sup>	0.0132 <sup>a</sup>	0.7649 <sup>b</sup>	0.0010	0.0625	-0.5005	-0.3999	-0.8994	-0.0109	-0.6911
s.e.	0.5310	0.0072	0.3362	0.0088	0.4163	0.7070	0.4402	0.8043	0.0097	0.4603
Aged 46-55	-0.2464	-0.0034	-0.1899	-0.0103	-0.6203	-1.9239 <sup>a</sup>	-1.5195 <sup>b</sup>	-2.0172 <sup>a</sup>	-0.0249 <sup>a</sup>	-1.5361 <sup>b</sup>
s.e.	0.6227	0.0085	0.3886	0.0123	0.5707	1.0067	0.6153	1.1871	0.0145	0.6675
Aged 56 plus	-4.8570 <sup>C</sup>	-0.0689 <sup>C</sup>	-3.5859 <sup>C</sup>	-0.0849 <sup>C</sup>	-4.4703 <sup>C</sup>	-0.1045 <sup>C</sup>	-5.5635 <sup>C</sup>	-8.3707 <sup>C</sup>	-0.1122 <sup>C</sup>	-6.0236 <sup>C</sup>
s.e.	0.7107	0.0100	0.4085	0.0164	0.6330	0.0170	0.6744	1.4741	0.0197	0.7459
Degree	4.0718 <sup>C</sup>	0.0550 <sup>C</sup>	3.1510 <sup>C</sup>	0.1643 <sup>C</sup>	10.1072 <sup>C</sup>	0.1615 <sup>C</sup>	10.0023 <sup>C</sup>	16.8009 <sup>C</sup>	0.2068 <sup>C</sup>	12.8715 <sup>C</sup>
s.e.	0.4968	0.0066	0.3200	0.0132	0.7465	0.0129	0.7233	1.4291	0.0159	0.8763
Diploma	2.6090 <sup>C</sup>	0.0358 <sup>C</sup>	1.9933 <sup>C</sup>	0.1131 <sup>C</sup>	6.1035 <sup>C</sup>	0.1095 <sup>C</sup>	5.9661 <sup>C</sup>	10.5949 <sup>C</sup>	0.1430 <sup>C</sup>	7.7200 <sup>C</sup>
s.e.	0.5646	0.0076	0.3546	0.0184	0.8859	0.0181	0.8723	1.8181	0.0222	1.0396
Certificate	1.7718 <sup>C</sup>	0.0246 <sup>C</sup>	1.3435 <sup>C</sup>	0.0766 <sup>C</sup>	3.8273 <sup>C</sup>	0.0706 <sup>C</sup>	3.5580 <sup>C</sup>	6.2215 <sup>C</sup>	0.0888 <sup>C</sup>	4.3507 <sup>C</sup>
s.e.	0.5428	0.0074	0.3344	0.0139	0.5590	0.0138	0.5528	1.2124	0.0167	0.6228

(continued on next page)

Table 5.1 (continued)

	Model I: Pooled Tobit				Model II: RE Tobit				Model III: Cor. RE Tobit				Model IV: AR. Cor. RE Tobit				
	$E(y^* x)$	$Pr(y^*>0 x)$	$E(y x)$	$E(y^* x)$	$Pr(y^*>0 x)$	$E(y x)$	$E(y^* x)$	$Pr(y^*>0 x)$	$E(y x)$	$E(y^* x)$	$Pr(y^*>0 x)$	$E(y x)$	$E(y^* x)$	$Pr(y^*>0 x)$	$E(y x)$	$E(y^* x)$	$Pr(y^*>0 x)$
Year 12	2.0560 <sup>C</sup>	0.0284 <sup>C</sup>	1.5630 <sup>C</sup>	5.6239 <sup>C</sup>	0.0839 <sup>C</sup>	4.2573 <sup>C</sup>	5.4759 <sup>C</sup>	0.0801 <sup>C</sup>	4.1118 <sup>C</sup>	7.1595 <sup>C</sup>	0.1011 <sup>C</sup>	5.0531 <sup>C</sup>					
s.e.	0.5136	0.0070	0.3170	1.0807	0.0154	0.6278	1.0783	0.0151	0.6216	1.3450	0.0183	0.6947					
Health	-3.9283 <sup>C</sup>	-0.0547 <sup>C</sup>	-2.9565 <sup>C</sup>	-3.0928 <sup>C</sup>	-0.0430 <sup>C</sup>	-2.4014 <sup>C</sup>	-1.2152 <sup>a</sup>	-0.0163 <sup>a</sup>	-0.9457 <sup>b</sup>	-1.0963 <sup>a</sup>	-0.0141 <sup>a</sup>	-0.8203 <sup>b</sup>					
s.e.	0.4123	0.0058	0.2367	0.5330	0.0076	0.3077	0.6763	0.0092	0.3987	0.6065	0.0078	0.3290					
Child 0-2	-6.1477 <sup>C</sup>	-0.0830 <sup>C</sup>	-4.7194 <sup>C</sup>	-10.5131 <sup>C</sup>	-0.1410 <sup>C</sup>	-8.2966 <sup>C</sup>	-9.5885 <sup>C</sup>	-0.1266 <sup>C</sup>	-7.5037 <sup>C</sup>	-12.8591 <sup>C</sup>	-0.1631 <sup>C</sup>	-9.6715 <sup>C</sup>					
s.e.	0.4744	0.0062	0.3636	0.453	0.0063	0.3635	0.5251	0.0072	0.416	0.5392	0.0073	0.4186					
Child 3-5	-0.8459 <sup>a</sup>	-0.0114 <sup>a</sup>	-0.6494 <sup>a</sup>	-3.7566 <sup>C</sup>	-0.0504 <sup>C</sup>	-2.9646 <sup>C</sup>	-2.9959 <sup>C</sup>	-0.0396 <sup>C</sup>	-2.3445 <sup>C</sup>	-5.1697 <sup>C</sup>	-0.0656 <sup>C</sup>	-3.8882 <sup>C</sup>					
s.e.	0.4603	0.0062	0.3533	0.5144	0.0069	0.4071	0.6382	0.0085	0.4999	0.6852	0.0088	0.5173					
Child 6-17	-0.0859	-0.0012	-0.0659	-0.7507 <sup>b</sup>	-0.0101 <sup>b</sup>	-0.5924 <sup>b</sup>	-0.4328	-0.0057	-0.3387	-0.5417	-0.0069	-0.4074					
s.e.	0.1818	0.0025	0.1396	0.3073	0.0041	0.2424	0.4740	0.0063	0.3708	0.4737	0.006	0.3561					
Capital city	-0.0872	-0.0012	-0.067	-0.4997	-0.0067	-0.3946	0.0653	0.0009	0.0511	-0.7631	-0.0097	-0.5745					
s.e.	0.3782	0.0051	0.2345	0.6538	0.0087	0.3950	1.2733	0.0168	0.7623	1.2109	0.0153	0.6677					
ESC	-0.0853	-0.0011	-0.0658	-0.1232	-0.0016	-0.0979	-0.4493	-0.0058	-0.3538	-0.5231	-0.0065	-0.3965					
s.e.	0.5335	0.0072	0.3328	1.3419	0.0177	0.8170	1.3222	0.0173	0.7952	1.7501	0.0220	0.9667					
NESC	-1.9929 <sup>C</sup>	-0.0273 <sup>C</sup>	-1.5097 <sup>C</sup>	-3.9546 <sup>C</sup>	-0.0558 <sup>C</sup>	-3.0392 <sup>C</sup>	-4.4715 <sup>C</sup>	-0.0623 <sup>C</sup>	-3.3981 <sup>C</sup>	-5.5143 <sup>C</sup>	-0.0736 <sup>b</sup>	-3.9996 <sup>C</sup>					
s.e.	0.5125	0.0071	0.3015	1.1508	0.0169	0.6429	1.1592	0.0168	0.6311	1.5133	0.021	0.7446					
Unemployed rate	0.0335	0.0005	0.0257	0.0071	0.0001	0.0056	0.0350	0.0005	0.0274	-0.0103	-0.0001	-0.0077					
s.e.	0.2025	0.0027	0.1555	0.2103	0.0028	0.1660	0.2103	0.0028	0.1646	0.2235	0.0028	0.1681					
Health: mean							-12.6297 <sup>C</sup>	-0.1668 <sup>C</sup>	-9.8836 <sup>C</sup>	-17.3743 <sup>C</sup>	-0.2204 <sup>C</sup>	-13.0674 <sup>C</sup>					
s.e.							1.4233	0.0183	1.1173	1.8147	0.0223	1.3711					
Child 0-2: mean							-3.1861	-0.0421	-2.4933	-1.8129	-0.0230	-1.3635					
s.e.							2.3557	0.0310	1.8420	3.0228	0.0383	2.2722					
Child 3-5: mean							-6.2744 <sup>b</sup>	-0.0828 <sup>C</sup>	-4.9101 <sup>b</sup>	-10.1854 <sup>C</sup>	-0.1292 <sup>C</sup>	-7.6606 <sup>C</sup>					
s.e.							2.4455	0.0322	1.9157	3.1766	0.0400	2.3948					



**Table 5.2 Coefficient and MME estimates of the structural specification**

	Model I: Pooled simple			Model II: RE			Model III: Cor. RE			AR. Cor. RE		
	$E(y^* x)$	$Pr(y^*>0 x)$	$E(y x)$	$E(y^* x)$	$Pr(y^*>0 x)$	$E(y x)$	$E(y^* x)$	$Pr(y^*>0 x)$	$E(y x)$	$E(y^* x)$	$Pr(y^*>0 x)$	$E(y x)$
Lagged hours	0.8810 <sup>c</sup>	0.0115 <sup>c</sup>	0.6724 <sup>c</sup>	0.3442 <sup>c</sup>	0.0045 <sup>c</sup>	0.2697 <sup>c</sup>	0.3394 <sup>c</sup>	0.0044 <sup>c</sup>	0.2642 <sup>c</sup>	0.0446	0.0006	0.0336
s.e.	0.0098	0.0001	0.0069	0.0137	0.0002	0.0107	0.0137	0.0002	0.0106	0.0316	0.0004	0.0239
Own wages: deviation	0.0311 <sup>c</sup>	0.0004 <sup>c</sup>	0.0237 <sup>c</sup>	0.0180 <sup>b</sup>	0.0002 <sup>b</sup>	0.0141 <sup>b</sup>	0.0175 <sup>b</sup>	0.0002 <sup>b</sup>	0.0136 <sup>b</sup>	0.0110	0.0001	0.0083
s.e.	0.0100	0.0001	0.0077	0.0084	0.0001	0.0066	0.0085	0.0001	0.0066	0.0083	0.0001	0.0063
Own wages: mean	0.1951 <sup>c</sup>	0.0026 <sup>c</sup>	0.1489 <sup>c</sup>	0.4301 <sup>c</sup>	0.0057 <sup>c</sup>	0.3370 <sup>c</sup>	0.4014 <sup>c</sup>	0.0052 <sup>c</sup>	0.3125 <sup>c</sup>	0.5083 <sup>c</sup>	0.0065 <sup>c</sup>	0.3834 <sup>c</sup>
s.e.	0.0129	0.0002	0.0099	0.0296	0.0004	0.0232	0.0312	0.0004	0.0242	0.0415	0.0005	0.0313
Family non- labour income: deviation	-0.0099	-0.0001	-0.0076	0.0025	0.0000	0.0020	0.0014	0.0000	0.0011	-0.0045	-0.0001	-0.0034
s.e.	0.0472	0.0006	0.0360	0.0391	0.0005	0.0306	0.0391	0.0005	0.0304	0.0377	0.0005	0.0284
Family non- labour income: mean	-0.2461 <sup>c</sup>	-0.0032 <sup>c</sup>	-0.1879 <sup>c</sup>	-0.5239 <sup>c</sup>	-0.0069 <sup>c</sup>	-0.4105 <sup>c</sup>	-0.5194 <sup>c</sup>	-0.0068 <sup>c</sup>	-0.4043 <sup>c</sup>	-0.6688 <sup>c</sup>	-0.0085 <sup>c</sup>	-0.5044 <sup>c</sup>
s.e.	0.0769	0.0010	0.0586	0.1598	0.0021	0.1252	0.1529	0.002	0.1190	0.1956	0.0025	0.1475
Partner's wages: deviation	-0.0197	-0.0003	-0.0150	-0.0400 <sup>b</sup>	-0.0005 <sup>b</sup>	-0.0313 <sup>b</sup>	-0.0420 <sup>b</sup>	-0.0005 <sup>b</sup>	-0.0327 <sup>b</sup>	-0.0342 <sup>b</sup>	-0.0004 <sup>b</sup>	-0.0258 <sup>b</sup>
s.e.	0.0186	0.0002	0.0142	0.0178	0.0002	0.0139	0.0179	0.0002	0.0139	0.0149	0.0002	0.0112
Partner's wages: mean	-0.0657 <sup>c</sup>	-0.0009 <sup>c</sup>	-0.0502 <sup>c</sup>	-0.1755 <sup>c</sup>	-0.0023 <sup>c</sup>	-0.1375 <sup>c</sup>	-0.1726 <sup>c</sup>	-0.0022 <sup>c</sup>	-0.1343 <sup>c</sup>	-0.2300 <sup>c</sup>	-0.0029 <sup>c</sup>	-0.1735 <sup>c</sup>
s.e.	0.008	0.0001	0.0061	0.0252	0.0003	0.0198	0.0255	0.0003	0.0199	0.0333	0.0004	0.0252
Partner's working hours	1.5517 <sup>c</sup>	0.0203 <sup>c</sup>	1.1843 <sup>c</sup>	1.3611 <sup>c</sup>	0.0180 <sup>c</sup>	1.0665 <sup>c</sup>	1.2722 <sup>c</sup>	0.0166 <sup>c</sup>	0.9904 <sup>c</sup>	1.1391 <sup>c</sup>	0.0145 <sup>c</sup>	0.8591 <sup>c</sup>
s.e.	0.2324	0.0030	0.1775	0.2784	0.0036	0.2188	0.2774	0.0036	0.2166	0.2903	0.0037	0.2199

Partner's working hours squared	-0.1208 <sup>c</sup>	-0.0016 <sup>c</sup>	-0.0922 <sup>c</sup>	-0.0527	-0.0007	-0.0413	-0.0485	-0.0006	-0.0378	-0.0160	-0.0002	-0.0121
s.e.	0.0320	0.0004	0.0244	0.0361	0.0005	0.0283	0.0361	0.0005	0.0281	0.0371	0.0005	0.0280
Aged 18-25	2.2446	0.0288	1.7580	2.6263	0.0319	2.1340 <sup>a</sup>	2.8489	0.0330	2.3282 <sup>a</sup>	2.4427	0.0280	1.9364
s.e.	1.6310	0.0204	1.0829	1.8315	0.0211	1.2098	1.8742	0.0205	1.2636	2.2679	0.0249	1.4097
Aged 36-45	0.6198	0.0081	0.4790	-0.2734	-0.0035	-0.2173	-0.8834	-0.011	-0.7023	-1.1971	-0.0146	-0.9233 <sup>b</sup>
s.e.	0.5274	0.0069	0.3306	0.6780	0.0087	0.4198	0.7088	0.0087	0.4416	0.8006	0.0096	0.4661
Aged 46-55	-0.4320	-0.0057	-0.3309	-0.9001	-0.0117	-0.7115	-2.2254 <sup>b</sup>	-0.0283 <sup>b</sup>	-1.7501 <sup>c</sup>	-2.3442 <sup>b</sup>	-0.0291 <sup>b</sup>	-1.7914 <sup>c</sup>
s.e.	0.6202	0.0082	0.3838	0.9344	0.0121	0.5735	1.0065	0.0127	0.6153	1.1737	0.0144	0.6701
Aged 56 plus	-4.2788 <sup>c</sup>	-0.0583 <sup>c</sup>	-3.1659 <sup>c</sup>	-5.4445 <sup>c</sup>	-0.0765 <sup>c</sup>	-4.1332 <sup>c</sup>	-7.3422 <sup>c</sup>	-0.1015 <sup>c</sup>	-5.5180 <sup>c</sup>	-8.3392 <sup>c</sup>	-0.1120 <sup>c</sup>	-6.0416 <sup>c</sup>
s.e.	0.7209	0.0098	0.4160	1.1435	0.0163	0.6465	1.2299	0.0170	0.6864	1.4812	0.0199	0.7618
Degree	2.1298 <sup>c</sup>	0.0280 <sup>c</sup>	1.6271 <sup>c</sup>	8.2190 <sup>c</sup>	0.1090 <sup>c</sup>	6.4915 <sup>c</sup>	8.3345 <sup>c</sup>	0.1088 <sup>c</sup>	6.5455 <sup>c</sup>	11.3104 <sup>c</sup>	0.1441 <sup>c</sup>	8.6048 <sup>c</sup>
s.e.	0.4849	0.0064	0.3024	1.0680	0.0134	0.6772	1.0667	0.0132	0.6731	1.3743	0.0165	0.8154
Diploma	1.6671 <sup>c</sup>	0.0221 <sup>c</sup>	1.2686 <sup>c</sup>	6.0177 <sup>c</sup>	0.0831 <sup>c</sup>	4.6672 <sup>c</sup>	5.6970 <sup>c</sup>	0.0779 <sup>c</sup>	4.3778 <sup>c</sup>	7.7092 <sup>c</sup>	0.1037 <sup>c</sup>	5.6917 <sup>c</sup>
s.e.	0.5674	0.0074	0.3528	1.3511	0.0174	0.8428	1.3333	0.0171	0.8201	1.7186	0.0215	0.9861
Certificate	1.7210 <sup>c</sup>	0.0228 <sup>c</sup>	1.3102 <sup>c</sup>	4.7647 <sup>c</sup>	0.0673 <sup>c</sup>	3.6550 <sup>c</sup>	4.6297 <sup>c</sup>	0.0645 <sup>c</sup>	3.5245 <sup>c</sup>	6.1154 <sup>c</sup>	0.0842 <sup>c</sup>	4.4507 <sup>c</sup>
s.e.	0.5548	0.0073	0.3453	0.9715	0.0132	0.5834	0.9702	0.013	0.5769	1.1961	0.0158	0.6543
Year 12	1.4383 <sup>c</sup>	0.0191 <sup>c</sup>	1.0923 <sup>c</sup>	4.3824 <sup>c</sup>	0.0623 <sup>c</sup>	3.3501 <sup>c</sup>	4.3943 <sup>c</sup>	0.0615 <sup>c</sup>	3.3383 <sup>c</sup>	5.8324 <sup>c</sup>	0.0806 <sup>c</sup>	4.2337 <sup>c</sup>
s.e.	0.5228	0.0069	0.3225	1.0831	0.0149	0.6406	1.0826	0.0147	0.6366	1.3494	0.018	0.727
Health	-3.1564 <sup>c</sup>	-0.0424 <sup>c</sup>	-2.3721 <sup>c</sup>	-2.7175 <sup>c</sup>	-0.0370 <sup>c</sup>	-2.1005 <sup>c</sup>	-1.2068 <sup>a</sup>	-0.0159 <sup>a</sup>	-0.9343 <sup>b</sup>	-1.1201 <sup>a</sup>	-0.0144 <sup>a</sup>	-0.8403 <sup>b</sup>
s.e.	0.4324	0.0059	0.2499	0.5544	0.0078	0.3193	0.6918	0.0093	0.4057	0.629	0.0082	0.3444
Child 0-2	-6.4097 <sup>c</sup>	-0.0838 <sup>c</sup>	-4.8922 <sup>c</sup>	-10.5732 <sup>c</sup>	-0.1396 <sup>c</sup>	-8.2850 <sup>c</sup>	-9.6229 <sup>c</sup>	-0.1253 <sup>c</sup>	-7.4910 <sup>c</sup>	-12.5954 <sup>c</sup>	-0.1603 <sup>c</sup>	-9.4991 <sup>c</sup>
s.e.	0.4738	0.006	0.3610	0.4502	0.0061	0.3563	0.5222	0.0070	0.4099	0.5402	0.0074	0.4171
Child 3-5	-1.0221 <sup>b</sup>	-0.0134 <sup>b</sup>	-0.7801 <sup>b</sup>	-3.9057 <sup>c</sup>	-0.0516 <sup>c</sup>	-3.0604 <sup>c</sup>	-3.0417 <sup>c</sup>	-0.0396 <sup>c</sup>	-2.3679 <sup>c</sup>	-5.0039 <sup>c</sup>	-0.0637 <sup>c</sup>	-3.7738 <sup>c</sup>
s.e.	0.452	0.0059	0.345	0.5060	0.0067	0.3975	0.6363	0.0083	0.4958	0.6839	0.0088	0.5177
Child 6-17	-0.2632	-0.0034	-0.2009	-0.9639 <sup>c</sup>	-0.0127 <sup>c</sup>	-0.7553 <sup>c</sup>	-0.4279	-0.0056	-0.3331	-0.5674	-0.0072	-0.428
s.e.	0.1829	0.0024	0.1396	0.3021	0.0040	0.2366	0.4706	0.0061	0.3662	0.4706	0.006	0.3547
Capital city	-0.3430	-0.0045	-0.2619	-0.8161	-0.0108	-0.6401 <sup>a</sup>	-0.3535	-0.0046	-0.2753	-1.1490	-0.0146	-0.8679
s.e.	0.3747	0.0049	0.2315	0.6409	0.0084	0.3866	1.2870	0.0167	0.7699	1.2291	0.0156	0.6862

(continued on next page)

Table 5.2 (continued)

	Model I: Pooled simple				Model II: RE				Model III: Cor. RE				AR. Cor. RE	
	$E(y^* x)$	$Pr(y^*>0 x)$	$E(y x)$		$E(y^* x)$	$Pr(y^*>0 x)$	$E(y x)$		$E(y^* x)$	$Pr(y^*>0 x)$	$E(y x)$		$E(y^* x)$	$Pr(y^*>0 x)$
ESC	0.0213	0.0003	0.0163	0.2335	0.0030	0.1843	0.0474	0.0006	0.0371	0.1299	0.0016	0.0988		
s.e.	0.5430	0.0071	0.3368	1.3632	0.0177	0.8312	1.336	0.0172	0.8071	1.7357	0.0217	0.9782		
NESC	-1.2201 <sup>b</sup>	-0.0161 <sup>b</sup>	-0.9238 <sup>c</sup>	-2.5748 <sup>b</sup>	-0.0352 <sup>b</sup>	-1.9831 <sup>c</sup>	-2.8652 <sup>c</sup>	-0.0387 <sup>b</sup>	-2.1890 <sup>c</sup>	-3.6154 <sup>b</sup>	-0.0478 <sup>b</sup>	-2.6618 <sup>c</sup>		
s.e.	0.5148	0.0068	0.3079	1.1043	0.0155	0.6279	1.1059	0.0153	0.6225	1.4300	0.0194	0.7381		
Unem rate	0.1313	0.0017	0.1002	0.0343	0.0005	0.0269	0.0602	0.0008	0.0469	0.0273	0.0003	0.0206		
s.e.	0.2028	0.0027	0.1548	0.2092	0.0028	0.1639	0.209	0.0027	0.1627	0.2223	0.0028	0.1676		
Health: mean							-9.8383 <sup>c</sup>	-0.1281 <sup>c</sup>	-7.6587 <sup>c</sup>	-13.4628 <sup>c</sup>	-0.1714 <sup>c</sup>	-10.1532 <sup>c</sup>		
s.e.							1.4144	0.0181	1.1011	1.7688	0.022	1.3355		
Child 0-2: mean							-3.5508	-0.0462	-2.7641	-2.2207	-0.0283	-1.6748		
s.e.							2.2939	0.0298	1.7840	2.9155	0.0371	2.1973		
Child 3-5: mean							-5.4673 <sup>b</sup>	-0.0712 <sup>b</sup>	-4.2561 <sup>b</sup>	-8.8641 <sup>c</sup>	-0.1128 <sup>c</sup>	-6.6850 <sup>c</sup>		
s.e.							2.4026	0.0312	1.8717	3.1252	0.0396	2.3610		
Child 6-17: mean							-1.2406 <sup>b</sup>	-0.0161 <sup>b</sup>	-0.9657 <sup>b</sup>	-1.7737 <sup>b</sup>	-0.0226 <sup>b</sup>	-1.3377 <sup>b</sup>		
s.e.							0.6128	0.0079	0.4774	0.6978	0.0088	0.5271		
Capital city: mean							-0.7465	-0.0097	-0.5811	-0.3219	-0.0041	-0.2428		
s.e.							1.5289	0.0199	1.1901	1.6327	0.0208	1.2313		
Wave 3	0.0429	0.0006	0.0322	-0.3043	-0.0041	-0.2359	-0.3256	-0.0043	-0.2504	-0.4335	-0.0056	-0.3237		
s.e.	0.5412	0.0072	0.324	0.5285	0.0071	0.3124	0.5271	0.0070	0.3082	0.482	0.0062	0.2640		
Wave 4	1.2000 <sup>b</sup>	0.0158 <sup>b</sup>	0.9110 <sup>b</sup>	0.5134	0.0068	0.4009	0.5856	0.0077	0.4538	0.2539	0.0033	0.1907		
s.e.	0.5921	0.0078	0.3613	0.5309	0.0071	0.3172	0.5301	0.0070	0.3137	0.5629	0.0072	0.3109		
Wave 5	1.4960 <sup>b</sup>	0.0196 <sup>b</sup>	1.1386 <sup>c</sup>	0.8859	0.0117	0.6938 <sup>b</sup>	1.0254 <sup>a</sup>	0.0134 <sup>a</sup>	0.7976 <sup>b</sup>	0.7461	0.0095	0.5627 <sup>a</sup>		
s.e.	0.6604	0.0087	0.4054	0.5732	0.0076	0.3444	0.5706	0.0074	0.3400	0.5902	0.0075	0.3283		
Wave 6	1.8095 <sup>b</sup>	0.0237 <sup>b</sup>	1.3809 <sup>c</sup>	1.2606 <sup>b</sup>	0.0166 <sup>b</sup>	0.9904 <sup>c</sup>	1.4915 <sup>b</sup>	0.0193 <sup>b</sup>	1.1647 <sup>c</sup>	1.2639 <sup>b</sup>	0.0160 <sup>b</sup>	0.9574 <sup>c</sup>		
s.e.	0.7125	0.0093	0.4406	0.6261	0.0082	0.3789	0.6299	0.0081	0.3788	0.6363	0.0080	0.3570		

Cons	-6.5165 <sup>c</sup>	-0.0852 <sup>c</sup>	-4.9737 <sup>c</sup>	3.2401 <sup>a</sup>	0.0428 <sup>a</sup>	2.5389	8.1404 <sup>c</sup>	0.1060 <sup>c</sup>	6.3370 <sup>c</sup>	15.4697 <sup>c</sup>	0.1969 <sup>c</sup>	11.6668 <sup>c</sup>
s.e.	1.6712	0.0218	1.2741	1.9673	0.0259	1.5452	2.1158	0.0272	1.6554	2.5269	0.0315	1.9298
Variance of time variant error	2.6440 <sup>c</sup>			2.4862 <sup>c</sup>			2.4832 <sup>c</sup>			2.5056 <sup>c</sup>		
s.e.	0.0062			0.0054			0.0056			0.0079		
Ln(variance of random effects)				5.1633 <sup>c</sup>			5.1181 <sup>c</sup>			5.6879 <sup>c</sup>		
s.e.				0.0618			0.0614			0.0735		
Correlation of transitory error										0.2647		
s.e.										0.0261305		
Mean log-likelihood	-15,4305			-18.5024			-18.4721			-18.4498		

**a** 10 per cent level. **b** 5 per cent level. **c** Significant 1 per cent level.