Children's Goods and Expenditure-Dependent Equivalence Scales

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Abstract

This note is to correct an error in Donaldson and Pendakur (2004) in this Journal. In "Equivalent-expenditure functions and expenditure-dependent equivalence scales", we propose equivalence scales which are log-linear in expenditure and show that they are identifiable from behaviour under the maintained assumption of log-linearity. In the empirical work, we find the equivalence scales for families in comparison with single childless adults to be declining in expenditure. Equivalence scales which vary with expenditure allow expenditure-shares for children's goods to depend on expenditure, and in the empirical work, we find the expenditure-share equation for children's clothing to be declining in expenditure.

In the empirical work, we estimated a 10-good quadratic almost ideal demand system over 60 price regimes to recover equivalence scales wherein one of the goods was children's clothing. Unfortunately, we have since discovered that the children's clothing data are only comparable for the first 45 price regimes in the data. In particular, in the data for the first 45 price regimes, children's clothing is defined as clothing for children aged less than 14, but in the data for the last 15 price regimes, it is defined as clothing for children aged less than 4. To assess the importance of this error, we estimated two new demand systems: (1) a 9-good demand system which is identical to the original except that clothing for adults and clothing for children are pooled into a single good called 'clothing';

and (2) a 10-good demand system which is identical to the original except that it is estimated on only cases facing the first 45 price regimes. We use the first new demand system to check and confirm equivalence scale estimates, and the second new demand system to check and confirm the slope of the children's clothing expenditure-share equation. Estimation is by nonlinear least squares, and in the tables, the symbol "@" indicates a parameter which is set rather than estimated, asymptotic standard errors are provided, and the notations "*", "**", and "***" indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table 1 presents coefficients coefficients from Donaldson and Pendakur (2004) and from the first new demand system.

Table 1: Equivalence scale parameters

	60 price regimes: 19276 cases			
	Donaldson and Pendakur 2004		New	
Parameter	Coefficient	Std error	Coefficient	Std error
a_0^r	4.837	@	4.837	@
a_0^{coup}	-0.276***	0.099	-0.271**	0.112
a_0^{nlhs}	0.759***	0.120	0.807***	0.136
a_0^{clhs}	0.484***	0.039	0.489***	0.038
a_0^{spar}	0.387***	0.083	0.317***	0.075
a_0^{nage}	0.016***	0.003	0.018***	0.003
a_0^{cage}	0.042***	0.003	0.038***	0.003
b_0^r	0.000	@	0.000	@
b_0^{coup}	-0.066	0.130	-0.139	0.124
b_0^{nlhs}	-0.053	0.158	0.078	0.150
b_0^{clhs}	-0.109*	0.059	-0.154**	0.070
b_0^{spar}	-0.275***	0.124	-0.225*	0.123
b_0^{nage}	-0.009***	0.003	-0.007**	0.003
b_0^{cage}	0.004	0.005	0.005	0.005

The parameter estimates are very similar across the columns. In particular, the equivalence scale is downward sloping if the appropriate b parameter is negative, and the pattern of significance for those parameters (indeed all parameters) is unchanged when moving to the uncontaminated 9-good system. The reason that the estimated equivalence scale does not change when there is no separate expenditure-share equation for children's clothing is straightforward: given the log-linearity of the equivalence scale, children's goods expenditure-shares are linear in log-expenditure, and equivalence scales are not identified from linear

expenditure-share equations (see Pendakur 1999). When included separately, children's good expenditure-share equations do not carry any of the weight in identifying equivalence scales, so it does not affected estimated scales to pool children's goods into other goods.

Table 2 presents estimated coefficients for the children's clothing expenditure-share equation from Donaldson and Pendakur 2004 and from the second new demand system. Here, the error in the children's clothing data is important. The slope of the children's clothing expenditure-share equation is greatly understated compared with the estimates from the uncontaminated data. However, the finding of declining expenditure shares shown by the significantly negative coefficient holds up in the smaller sample.

Table 2: Children's Clothing expenditure-share equation

	60 price regimes: 19276 cases		45 price regimes: 14079 cases	
	Donaldson and Pendakur 2004		New	
Parameter	Coefficient	Std error	Coefficient	Std error
b_0^{clhs}	-0.00045***	0.00004	-0.680***	0.267
b_0^{spar}	-0.00429***	0.00079	0.316	0.396
b_0^{cage}	0.00016	0.00004	0.003	0.023

The inclusion of an error in published work is troubling. We are comforted that the findings of the paper are essentially unaffected when we corrected the error.

References

[1] Donaldson, David and Krishna Pendakur, 2004, "Equivalent-expenditure functions and expenditure-dependent equivalence scales", Journal of Public Economics, January 2004, 88(1-2) pages 175-208.

[2] Pendakur, Krishna, 1999, "Semiparametric Estimates and Tests of Base-Independent Equivalence Scales". Journal of Econometrics 88(1), pp 1-40.