Appendix 1
Abstract for ACIAR Project ASEM/1998/60

RECENT economic reforms and market developments pose major challenges for the viability of the vast majority of Chinese wool textile mills. To ensure their long-term future, Chinese mills must adapt to the changing market and policy environment and improve the efficiency of their operations.

The primary goal of this project, ASEM/98/60, is to improve the long-term viability of Chinese wool textile mills. Ways to improve viability are to be identified through an economic analysis of mill fibre-input/textile-product selection and effluent treatment technologies. The analysis will adopt a whole-mill approach that takes the entire operation of the mills into account including the source of their fibre inputs and the markets for their textile products. A modelling framework, designed to experiment with various alternative mill management strategies, will incorporate findings from the processing prediction and effluent treatment research of Projects AS1/97/70 and AS1/97/69. However, the modelling framework will also draw upon a detailed synthesis of other operations of the mills, and a thorough analysis of their cost and revenue structures.

Project ASEM/98/60 is structured around this whole-mill approach. The core of the analysis is the *development of an economic modelling framework that synthesises operations of the mill*, and this forms the basis of ***Sub-project 1***. The modelling framework will be of sufficient detail to determine the impact of fibre-input/textile-product selection, effluent treatment, and other management decisions on mill profitability. Specific mills will be used as case studies to develop the economic models. Mills associated with Projects AS1/97/70 and AS1/97/69 will first be considered to maximise the synergies between the suite of ACIAR wool textile projects. However, other mill case studies will be needed to generalise the models and analysis to a broad range of mill types in China.

Mill managers seeking to tailor their manufacturing systems to improve mill profitability *require a thorough understanding of what their users want in terms of the relative value and importance that they place on particular attributes of the mill's products*. This is the basis of Sub-project 2. The emphasis in ***Sub-project 2*** is on the derived demand for intermediate textile products (such as yarns and fabrics). Mills need to determine their immediate manufacturing strategies in the full knowledge of end-user requirements. However, in the longer term, the derived demand for intermediate textile products will reflect changes in consumer preferences for final textile products. A detailed survey of consumer preferences is beyond the scope of this project. Nevertheless, information about the long-term trends in final consumer tastes and preference is crucial to the long-term viability of the wool textile mills. Consequently, Sub-project 2 will include a detailed review of all available information on trends in consumer tastes and preferences.

Mill managers can use the processing prediction research embodied in projects such as AS1/97/70 to identify the fibre inputs best suited to manufacture the textile products that are in greatest demand or that attract the highest prices. However, the profitability for mills of these higher-value products depends on the relative cost of fibre-inputs used to manufacture them. Furthermore, to take advantage of the processing prediction research, mills must have access to sufficient supplies of accurately described fibre inputs. Project ASEM/98/60 will *examine the supply pathways to these mills*. ***Sub-project 3*** analyses the supply pathways for domestic wool, while ***Sub-project 4*** examines the pathways for imported wool.

Investigation of the supply pathways will reveal the costs and availabilities of particular fibre inputs to mills to feed information into the economic modelling to be conducted as part of Sub-project 1. Both the domestic and imported supply chains for wool have impediments to mills receiving accurately specified wool on a reliable basis at least cost, and in a form that they could take advantage of the processing prediction research. For instance, existing supply pathways for Chinese domestic wool mean that mills often receive heterogeneous, poorly sorted raw wool for a price averaged over the different qualities. The analysis, therefore, will also have a normative focus in examining how administrative structures and contractual arrangements can be improved to minimise the transaction costs of getting the appropriate type and form of wool from suppliers to the mills.

Thus Project ASEM/98/60 involves direct collaboration with managers of selected mills, as well as Australian and Chinese scientists involved in the

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ACIAR/CSIRO wool textile science projects. However, the project also calls for discussions and collaboration with many other groups in the wool textile marketing chain. The Research Centre for Rural Economy (RCRE) attached to the Ministry of Agriculture, as the Chinese collaborator on Project ASEM/98/60, will play a crucial role in facilitating and co-ordinating fieldwork and research across the various parts of the Project. The RCRE has a well-deserved reputation for academic excellence and the necessary connections to facilitate the fieldwork and to disseminate the findings. Agro-industrialisation, including natural fibre processing, is high on its research agenda.

Project ASEM/98/60 has had a long gestation, with many organisations such as the CSIRO Wool Technology Group, AFFA, IWS, Agriculture Victoria and the CRC for Premium Wool Production interested in some or all of the issues of the project. As the lead organisation on Project ASEM/98/60, the China Agricultural Economics Group at the University of Queensland has liaised, and will continue to liaise, extensively with these other interested parties. In addition, a 'China Wool Group' (involving researchers on projects AS1/97/70, AS1/97/69 and ASEM/98/60, the ACIAR program co-ordinators on these projects, as well as interested IWS and AFFA and other Australian government and wool industry officials) was established in September 1999. This forum provides a useful conduit for the exchange of information between the suite of ACIAR wool textile projects in China and associated organisations.

Australia is the main overseas supplier of wool to China, while China is Australia's largest wool export market. The long-term viability of Chinese mills is central to the interests of the wool and wool textile industries in both countries. The CSIRO/ACIAR wool textile science projects have the potential to improve the technical efficiency with which Chinese wool textile mills undertake particular operations. Project ASEM/98/60 takes the next two crucial steps of showing (a) how the output from these CSIRO/ACIAR projects can best be used to improve overall mill profitability; and (b) the measures needed in the textile-product and wool-supply chains to facilitate the application of these technologies and processes. Both a demonstration of how these technologies and processes can assist mill profitability and how the domestic and imported raw material supply chains can be improved, are important steps towards ensuring the adoption of these new technologies by Chinese wool mills.

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Appendix 2
Programs and regressions to estimate cost coefficients

Appendix 2.1 Macro to categorise orders and determine aggregate throughputs

```
Sub weavingcost3unit()
'
' weavingcost3unit Macro
' Macro recorded 5/28/2003 by Colin Brown
' sorts records into 3 weaving classes
' 1-pure wool (100%)
' 2-mid wool blend fabrics (70 to 99 % wool)
' 3-low wool blend fabrics (<70%)
'

 Dim wcount(800)
 Dim wwoolp(800)
 Dim wden(800)
 Dim wyield(800)
 Dim wtput(800)
 Dim wmonth(800) As Integer
 Dim class(800) As Integer
 Dim amount(12, 12)

 For i = 1 To 12
 For j = 1 To 6
 amount(i, j) = 0
 Next j
 Next i

 rcount = 2
 For i = 1 To 439
 wcount(i) = Cells(rcount, 4)
 wwoolp(i) = Cells(rcount, 8)
 wden(i) = Cells(rcount, 9)
 wtput(i) = Cells(rcount, 6)
 wmonth(i) = Cells(rcount, 1)
 wyield(i) = Cells(rcount, 7)
 If wwoolp(i) = 100 Then
 If wcount(i) > 69 Then
' If wden(i) > 299 Then
 class(i) = 1
 Else
 class(i) = 2
 End If
 Else
 If wwoolp(i) > 69 Then
 class(i) = 3
 Else
 class(i) = 4
 End If
 End If

' class(i) = 2
' End If
' Else
' class(i) = 2
' End If
' Else
' If wwoolp(i) > 56 Then
' class(i) = 3
' Else
' class(i) = 4
' End If
' End If
' If wcount(i) > 71 Then
' If wden(i) > 299 Then
' class(i) = 1
' Else
' class(i) = 5
' End If
' Else
' If wden(i) < 300 Then
' class(i) = 2
' Else
' class(i) = 5


' End If
' End If
' Else
' If wwoolp(i) < 56 Then
' If wden(i) < 300 Then
' class(i) = 4
' Else
' class(i) = 5
' End If
' Else
' If wcount(i) < 71 Then
' If wden(i) > 299 Then
' class(i) = 3
' Else
' class(i) = 5
' End If
' Else
' class(i) = 5
' End If
' End If
' End If
 Cells(rcount, 13) = class(i)
 Sum = amount(wmonth(i), class(i))
 amount(wmonth(i), class(i)) = amount(wmonth(i),
 class(i)) + wtput(i)
 amount(wmonth(i), 6 + class(i)) = amount(wmonth(i),
 6 + class(i)) + wtput(i) * wyield(i)
```


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```
  rcount = rcount + 1
  Next i

  For i = 1 To 12
  For j = 1 To 4
  amount(i, 6) = amount(i, 6) + amount(i, j)
  If (amount(i, j) = 0) Then
  Else
  amount(i, 6 + j) = amount(i, 6 + j) / amount(i, j)
  End If
  Next j
  Next i

  Sheets.Add.Name = 'summary7'
  Sheets('summary7').Select
  rcount = 5
  For i = 1 To 12
  Cells(rcount, 1) = i
  For j = 1 To 4
  Cells(rcount, j + 1) = amount(i, j)
  Cells(rcount + 14, j + 1) = amount(i, 6 + j)
  Next j
  Cells(rcount, 5) = amount(i, 6)
  rcount = rcount + 1
  Next i

  rcount = 5
  For i = 1 To 12
  For j = 1 To 4
  Cells(rcount, 6 + j) = amount(i, j) / amount(i, 6) * 100
  Next j
  rcount = rcount + 1
  Next i

'
End Sub
```

Appendix 2.2 2-Categorisation weaving regressions

Appendix Table 2.2.1 Total weaving cost (2-type)

Dependent Variable:	TCOST			
Method:	Least Squares			
Date:	11/12/04 Time: 23:08			
Sample:	1 48			
Included observations:	48			

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	166186.0	29639.46	5.606919	0.0000
PURE	1.072551	0.148193	7.237519	0.0000
BLEND	1.346794	0.113860	11.82854	0.0000

R-squared	0.769538	Mean dependent var	496700.6
Adjusted R-squared	0.759295	S.D. dependent var	112047.7
S.E. of regression	54972.50	Akaike info criterion	24.72751
Sum squared resid.	1.36E+11	Schwarz criterion	24.84447
Log likelihood	–590.4604	F-statistic	75.12993
Durbin-Watson stat.	1.459408	Prob(F-statistic)	0.000000

Appendix Table 2.2.2 Variable weaving cost (2-type)

Dependent Variable:	VNDCOST			
Method:	Least Squares			
Date:	11/12/04 Time: 23:14			
Sample:	1 48			
Included observations:	48			

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	102624.4	22202.03	4.622295	0.0000
PURE	0.842133	0.111007	7.586299	0.0000
BLEND	1.145320	0.085289	13.42872	0.0000

R-squared	0.807848	Mean dependent var	375526.9
Adjusted R-squared	0.799308	S.D. dependent var	91918.57
S.E. of regression	41178.26	Akaike info criterion	24.14967
Sum squared resid.	7.63E+10	Schwarz criterion	24.26662
Log likelihood	–576.5921	F-statistic	94.59504
Durbin-Watson stat.	1.519351	Prob(F-statistic)	0.000000

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Appendix Table 2.2.3 Labour weaving cost (2-type)

Dependent Variable:	LCOST
Method:	Least Squares
Date:	11/12/04 Time: 23:16
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	105593.1	17050.49	6.192962	0.0000
PURE	0.405683	0.085250	4.758733	0.0000
BLEND	0.524663	0.065499	8.010202	0.0000

R-squared	0.602706	Mean dependent var	
Adjusted R-squared	0.585049	S.D. dependent var	
S.E. of regression	31623.66	Akaike info criterion	
Sum squared resid.	4.50E+10	Schwarz criterion	
Log likelihood	–563.9198	F-statistic	
Durbin-Watson stat.	1.840320	Prob(F-statistic)	

Appendix Table 2.2.4 Electricity weaving cost (2-type)

Dependent Variable:	ELCOST
Method:	Least Squares
Date:	11/12/04 Time: 23:12
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–12843.55	14932.73	–0.860094	0.3943
PURE	0.444359	0.074662	5.951644	0.0000
BLEND	0.533594	0.057364	9.301913	0.0000

R-squared	0.677211	Mean dependent var	120372.0
Adjusted R-squared	0.662865	S.D. dependent var	47699.36
S.E. of regression	27695.83	Akaike info criterion	23.35641
Sum squared resid.	3.45E+10	Schwarz criterion	23.47336
Log likelihood	–557.5539	F-statistic	47.20506
Durbin-Watson stat.	0.622071	Prob(F-statistic)	0.000000

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Appendix 2.3 3-Categorisation weaving regressions

Appendix Table 2.3.1 Total weaving cost (3-type)

Dependent Variable:	TCOST			
Method:	Least Squares			
Date:	11/13/04 Time: 00:26			
Sample:	1 48			
Included observations:	48			

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	148113.5	29390.32	5.039533	0.0000
HIGH	1.203424	0.152604	7.885925	0.0000
MEDIUM	1.128251	0.144447	7.810816	0.0000
LOW	1.735011	0.200819	8.639691	0.0000

R-squared	0.794270	Mean dependent var	496700.6
Adjusted R-squared	0.780243	S.D. dependent var	112047.7
S.E. of regression	52525.98	Akaike info criterion	24.65566
Sum squared resid.	1.21E+11	Schwarz criterion	24.81159
Log likelihood	–587.7358	F-statistic	56.62427
Durbin-Watson stat.	1.221855	Prob(F-statistic)	0.000000

Appendix Table 2.3.2 Variable weaving cost (3-type)

Dependent Variable:	VNDCOST			
Method:	Least Squares			
Date:	11/13/04 Time: 00:28			
Sample:	1 48			
Included observations:	48			

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	92657.09	21540.56	4.301517	0.0001
HIGH	0.926898	0.111846	8.287303	0.0000
MEDIUM	0.955588	0.105867	9.026272	0.0000
LOW	1.414975	0.147183	9.613730	0.0000

R-squared	0.828965	Mean dependent var	373871.1
Adjusted R-squared	0.817303	S.D. dependent var	90066.18
S.E. of regression	38497.00	Akaike info criterion	24.03420
Sum squared resid.	6.52E+10	Schwarz criterion	24.19014
Log likelihood	–572.8209	F-statistic	71.08573
Durbin-Watson stat.	1.313346	Prob(F-statistic)	0.000000

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Appendix Table 2.3.3 Labour weaving cost (3-type)

Dependent Variable:	LCOST
Method:	Least Squares
Date:	11/13/04 Time: 00:30
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	93334.45	16505.75	5.654661	0.0000
HIGH	0.494454	0.085703	5.769372	0.0000
MEDIUM	0.376425	0.081122	4.640217	0.0000
LOW	0.787990	0.112781	6.986919	0.0000

R-squared	0.661983	Mean dependent var	232931.8
Adjusted R-squared	0.638937	S.D. dependent var	49092.32
S.E. of regression	29498.86	Akaike info criterion	23.50175
Sum squared resid.	3.83E+10	Schwarz criterion	23.65768
Log likelihood	–560.0419	F-statistic	28.72370
Durbin-Watson stat.	1.618754	Prob(F-statistic)	0.000000

Appendix Table 2.3.4 Electricity weaving cost (3-type)

Dependent Variable:	ELCOST
Method:	Least Squares
Date:	11/13/04 Time: 00:31
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–12551.34	15671.13	–0.800921	0.4275
HIGH	0.442243	0.081370	5.434992	0.0000
MEDIUM	0.537128	0.077020	6.973841	0.0000
LOW	0.527317	0.107078	4.924610	0.0000

R-squared	0.677247	Mean dependent var	120372.0
Adjusted R-squared	0.655241	S.D. dependent var	47699.36
S.E. of regression	28007.24	Akaike info criterion	23.39797
Sum squared resid.	3.45E+10	Schwarz criterion	23.55390
Log likelihood	–557.5513	F-statistic	30.77573
Durbin-Watson stat.	0.622967	Prob(F-statistic)	0.000000

Appendix 2.4. 4-categorisation (count) regressions

Appendix Table 2.4.1 Total weaving cost (4-type, count)

Dependent Variable:	TCOST
Method:	Least Squares
Date:	11/13/04 Time: 00:07
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	150306.0	29595.70	5.078644	0.0000
PWOOLHC	1.304314	0.193673	6.734605	0.0000
PWOOLLC	1.024911	0.259803	3.944960	0.0003
MWOOL	1.124283	0.144979	7.754803	0.0000
LWOOL	1.751103	0.202340	8.654263	0.0000

R-squared	0.797673	Mean dependent var	496700.6
Adjusted R-squared	0.778852	S.D. dependent var	112047.7
S.E. of regression	52691.96	Akaike info criterion	24.68065
Sum squared resid.	1.19E+11	Schwarz criterion	24.87556
Log likelihood	–587.3355	F-statistic	42.38188
Durbin-Watson stat.	1.230857	Prob(F-statistic)	0.000000

Appendix Table 2.4.2 Variable weaving cost (4-type, count)

Dependent Variable:	VNDCOST
Method:	Least Squares
Date:	11/13/04 Time: 00:10
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	94940.19	21504.49	4.414900	0.0001
PWOOLHC	1.031954	0.140725	7.333134	0.0000
PWOOLLC	0.741014	0.188775	3.925388	0.0003
MWOOL	0.951455	0.105343	9.031983	0.0000
LWOOL	1.431731	0.147022	9.738215	0.0000

R-squared	0.834676	Mean dependent var	373871.1
Adjusted R-squared	0.819297	S.D. dependent var	90066.18
S.E. of regression	38286.43	Akaike info criterion	24.04191
Sum squared resid.	6.30E+10	Schwarz criterion	24.23683
Log likelihood	–572.0059	F-statistic	54.27367
Durbin-Watson stat.	1.276941	Prob(F-statistic)	0.000000

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Appendix Table 2.4.3 Labour weaving cost (4-type, count)

Dependent Variable: LCOST
Method: Least Squares
Date: 11/13/04 Time: 00:12
Sample: 1 48
Included observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	94214.18	16689.39	5.645154	0.0000
PWOOLHC	0.534934	0.109215	4.897996	0.0000
PWOOLLC	0.422828	0.146506	2.886082	0.0061
MWOOL	0.374833	0.081755	4.584808	0.0000
LWOOL	0.794447	0.114102	6.962599	0.0000

R-squared	0.664837	Mean dependent var	232931.8
Adjusted R-squared	0.633659	S.D. dependent var	49092.32
S.E. of regression	29713.66	Akaike info criterion	23.53493
Sum squared resid.	3.80E+10	Schwarz criterion	23.72985
Log likelihood	–559.8384	F-statistic	21.32397
Durbin-Watson stat.	1.585825	Prob(F-statistic)	0.000000

Appendix Table 2.4.4 Electricity weaving cost (4-type, count)

Dependent Variable: ELCOST
Method: Least Squares
Date: 11/13/04 Time: 00:16
Sample: 1 48
Included observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–9898.333	15219.99	–0.650351	0.5189
PWOOLHC	0.564320	0.099599	5.665905	0.0000
PWOOLLC	0.226242	0.133607	1.693343	0.0976
MWOOL	0.532326	0.074557	7.139817	0.0000
LWOOL	0.546789	0.104056	5.254751	0.0000

R-squared	0.704739	Mean dependent var	120372.0
Adjusted R-squared	0.677273	S.D. dependent var	47699.36
S.E. of regression	27097.55	Akaike info criterion	23.35061
Sum squared resid.	3.16E+10	Schwarz criterion	23.54552
Log likelihood	–555.4146	F-statistic	25.65852
Durbin-Watson stat.	0.815537	Prob(F-statistic)	0.000000

Appendix 2.5 4-categorisation (density) regressions

Appendix Table 2.5.1 Total weaving cost (4-type, density)

Dependent Variable:	TCOST
Method:	Least Squares
Date:	11/13/04 Time: 00:17
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	149822.2	30120.17	4.974148	0.0000
PWOOLHD	1.152166	0.216501	5.321751	0.0000
PWOOLLD	1.267538	0.244777	5.178331	0.0000
MWOOL	1.117251	0.149526	7.471931	0.0000
LWOOL	1.729645	0.203495	8.499685	0.0000

R-squared	0.794813	Mean dependent var	496700.6
Adjusted R-squared	0.775726	S.D. dependent var	112047.7
S.E. of regression	53063.12	Akaike info criterion	24.69468
Sum squared resid.	1.21E+11	Schwarz criterion	24.88960
Log likelihood	–587.6724	F-statistic	41.64120
Durbin-Watson stat.	1.215746	Prob(F-statistic)	0.000000

Appendix Table 2.5.2 Variable weaving cost (4-type, density)

Dependent Variable:	VNDCOST
Method:	Least Squares
Date:	11/13/04 Time: 00:20
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	91458.85	22077.95	4.142543	0.0002
PWOOLHD	0.962843	0.158695	6.067274	0.0000
PWOOLLD	0.881939	0.179421	4.915482	0.0000
MWOOL	0.963302	0.109602	8.789077	0.0000
LWOOL	1.418737	0.149161	9.511443	0.0000

R-squared	0.829378	Mean dependent var	373871.1
Adjusted R-squared	0.813506	S.D. dependent var	90066.18
S.E. of regression	38895.03	Akaike info criterion	24.07345
Sum squared resid.	6.51E+10	Schwarz criterion	24.26837
Log likelihood	–572.7629	F-statistic	52.25473
Durbin-Watson stat.	1.316526	Prob(F-statistic)	0.000000

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Appendix Table 2.5.3 Labour weaving cost (4-type, density)

Dependent Variable:	LCOST
Method:	Least Squares
Date:	11/13/04 Time: 00:22
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	95300.34	16843.99	5.657824	0.0000
PWOOLHD	0.435481	0.121073	3.596838	0.0008
PWOOLLD	0.568217	0.136886	4.151026	0.0002
MWOOL	0.363769	0.083619	4.350313	0.0001
LWOOL	0.781817	0.113800	6.870104	0.0000

R-squared	0.665725	Mean dependent var	232931.8
Adjusted R-squared	0.634629	S.D. dependent var	49092.32
S.E. of regression	29674.29	Akaike info criterion	23.53228
Sum squared resid.	3.79E+10	Schwarz criterion	23.72720
Log likelihood	–559.7748	F-statistic	21.40913
Durbin-Watson stat.	1.626656	Prob(F-statistic)	0.000000

Appendix Table 2.5.4 Electricity weaving cost (4-type, density)

Dependent Variable:	ELCOST
Method:	Least Squares
Date:	11/13/04 Time: 00:23
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–18385.26	15187.15	–1.210580	0.2327
PWOOLHD	0.617249	0.109164	5.654329	0.0000
PWOOLLD	0.223347	0.123421	1.809629	0.0773
MWOOL	0.574686	0.075394	7.622433	0.0000
LWOOL	0.545636	0.102606	5.317775	0.0000

R-squared	0.712148	Mean dependent var	120372.0
Adjusted R-squared	0.685371	S.D. dependent var	47699.36
S.E. of regression	26755.41	Akaike info criterion	23.32519
Sum squared resid.	3.08E+10	Schwarz criterion	23.52011
Log likelihood	–554.8046	F-statistic	26.59563
Durbin-Watson stat.	0.780940	Prob(F-statistic)	0.000000

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Appendix 2.6 Weaving regressions — alternative approach

Appendix Table 2.6.1 Total weaving cost — alternative approach

Dependent Variable:	UTCOST
Method:	Least Squares
Date:	11/13/04 Time: 23:40
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.703461	99.88515	0.057100	0.9547
WARPCOUNT	0.070262	0.104577	0.671872	0.5054
WEFTCOUNT	–0.108846	0.047609	–2.286271	0.0275
WEFTDENSITY	0.018743	0.020748	0.903359	0.3716
WEIGHT	–0.001291	0.024185	–0.053386	0.9577
WOOLP	–0.053635	0.041993	–1.277219	0.2087
YIELD	–0.032418	1.003493	–0.032305	0.9744

R-squared	0.144277	Mean dependent var	2.178942
Adjusted R-squared	0.019050	S.D. dependent var	1.889735
S.E. of regression	1.871649	Akaike info criterion	4.225555
Sum squared resid.	143.6259	Schwarz criterion	4.498438
Log likelihood	–94.41332	F-statistic	1.152120
Durbin-Watson stat.	2.226963	Prob(F-statistic)	0.350380

Appendix Table 2.6.2 Variable weaving cost — alternative approach

Dependent Variable:	UVNDCOST
Method:	Least Squares
Date:	11/13/04 Time: 23:54
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.11064	81.27781	0.185913	0.8534
WARPCOUNT	0.030866	0.085095	0.362727	0.7187
WEFTCOUNT	–0.080677	0.038740	–2.082544	0.0436
WEFTDENSITY	0.019522	0.016883	1.156317	0.2542
WEIGHT	–0.005476	0.019680	–0.278230	0.7822
WOOLP	–0.047460	0.034170	–1.388926	0.1724
YIELD	–0.116660	0.816555	–0.142869	0.8871

R-squared	0.139002	Mean dependent var	1.733430
Adjusted R-squared	0.013002	S.D. dependent var	1.532983
S.E. of regression	1.522985	Akaike info criterion	3.813259
Sum squared resid.	95.09878	Schwarz criterion	4.086142
Log likelihood	–84.51821	F-statistic	1.103193
Durbin-Watson stat.	2.223160	Prob(F-statistic)	0.377079

Appendix Table 2.6.3 Labour weaving cost — alternative approach

Dependent Variable:	ULCOST
Method:	Least Squares
Date:	11/14/04 Time: 00:01
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.789177	50.16934	0.155258	0.8774
WARPCOUNT	0.037969	0.052526	0.722858	0.4739
WEFTCOUNT	–0.059386	0.023912	–2.483489	0.0172
WEFTDENSITY	0.010716	0.010421	1.028279	0.3098
WEIGHT	–0.000671	0.012148	–0.055269	0.9562
WOOLP	–0.029417	0.021092	–1.394693	0.1706
YIELD	–0.068487	0.504025	–0.135881	0.8926

R-squared	0.168905	Mean dependent var	1.038922
Adjusted R-squared	0.047281	S.D. dependent var	0.963118
S.E. of regression	0.940074	Akaike info criterion	2.848321
Sum squared resid.	36.23328	Schwarz criterion	3.121204
Log likelihood	–61.35970	F-statistic	1.388747
Durbin-Watson stat.	2.221661	Prob(F-statistic)	0.242233

Appendix Table 2.6.4 Electricity weaving cost — alternative approach

Dependent Variable:	UELCOST
Method:	Least Squares
Date:	11/13/04 Time: 23:57
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.015107	24.57906	0.285410	0.7768
WARPCOUNT	–0.010695	0.025734	–0.415618	0.6799
WEFTCOUNT	–0.013044	0.011715	–1.113450	0.2720
WEFTDENSITY	0.008523	0.005106	1.669362	0.1027
WEIGHT	–0.004646	0.005951	–0.780645	0.4395
WOOLP	–0.015370	0.010333	–1.487387	0.1446
YIELD	–0.051128	0.246933	–0.207054	0.8370

R-squared	0.104232	Mean dependent var	0.506445
Adjusted R-squared	–0.026856	S.D. dependent var	0.454500
S.E. of regression	0.460563	Akaike info criterion	1.421303
Sum squared resid.	8.696843	Schwarz criterion	1.694186
Log likelihood	–27.11127	F-statistic	0.795130
Durbin-Watson stat.	2.159147	Prob(F-statistic)	0.579176

Appendix 2.7 Spinning regressions

Appendix Table 2.7.1 Total spinning cost

Dependent Variable:	TCOST			
Method:	Least Squares			
Date:	11/16/04 Time: 14:47			
Sample:	1 48			
Included observations:	48			

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	111807.0	32208.73	3.471326	0.0012
LESS60	6.018358	1.048105	5.742135	0.0000
S60	6.178667	0.819196	7.542355	0.0000
S70	8.169573	0.902733	9.049820	0.0000
OVER80	8.780686	0.748319	11.73388	0.0000

R-squared	0.869290	Mean dependent var	621570.5
Adjusted R-squared	0.857131	S.D. dependent var	154108.4
S.E. of regression	58249.89	Akaike info criterion	24.88120
Sum squared resid.	1.46E+11	Schwarz criterion	25.07612
Log likelihood	–592.1489	F-statistic	71.49321
Durbin-Watson stat.	1.814161	Prob(F-statistic)	0.000000

Appendix Table 2.7.2 Variable spinning cost

Dependent Variable:	VNDCOST			
Method:	Least Squares			
Date:	11/16/04 Time: 14:55			
Sample:	1 48			
Included observations:	48			

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	77780.06	28913.30	2.690113	0.0101
LESS60	5.613067	0.940868	5.965840	0.0000
S60	6.179077	0.735380	8.402561	0.0000
S70	7.638379	0.810370	9.425789	0.0000
OVER80	7.726683	0.671755	11.50223	0.0000

R-squared	0.872787	Mean dependent var	546985.6
Adjusted R-squared	0.860953	S.D. dependent var	140229.2
S.E. of regression	52290.07	Akaike info criterion	24.66533
Sum squared resid.	1.18E+11	Schwarz criterion	24.86025
Log likelihood	–586.9680	F-statistic	73.75377
Durbin-Watson stat.	1.976424	Prob(F-statistic)	0.000000

Appendix Table 2.7.3 Labour spinning cost

Dependent Variable:	LCOST
Method:	Least Squares
Date:	11/16/04 Time: 14:56
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	43588.82	18762.14	2.323233	0.0250
LESS60	1.939840	0.610539	3.177259	0.0028
S60	2.425868	0.477196	5.083590	0.0000
S70	3.751636	0.525858	7.134319	0.0000
OVER80	3.539876	0.435909	8.120681	0.0000

R-squared	0.773352	Mean dependent var	250784.4
Adjusted R-squared	0.752268	S.D. dependent var	68173.10
S.E. of regression	33931.56	Akaike info criterion	23.80041
Sum squared resid.	4.95E+10	Schwarz criterion	23.99533
Log likelihood	–566.2099	F-statistic	36.68034
Durbin-Watson stat.	1.679874	Prob(F-statistic)	0.000000

Appendix Table 2.7.4 Electricity spinning cost

Dependent Variable:	ELCOST
Method:	Least Squares
Date:	11/16/04 Time: 14:58
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3342.221	20264.08	0.164933	0.8698
LESS60	3.483806	0.659413	5.283190	0.0000
S60	4.208989	0.515396	8.166515	0.0000
S70	4.015287	0.567953	7.069748	0.0000
OVER80	4.280636	0.470804	9.092185	0.0000

R-squared	0.817787	Mean dependent var	274147.6
Adjusted R-squared	0.800837	S.D. dependent var	82119.15
S.E. of regression	36647.83	Akaike info criterion	23.95443
Sum squared resid.	5.78E+10	Schwarz criterion	24.14935
Log likelihood	–569.9063	F-statistic	48.24704
Durbin-Watson stat.	1.459224	Prob(F-statistic)	0.000000

Appendix 2.8 Spinning cost regressions — alternative approach — 2 variable

Appendix Table 2.8.1 Total spinning cost — alternative approach

Dependent Variable: UTCOST
Method: Least Squares
Date: 11/16/04 Time: 15:07
Sample: 1 48
Included observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.710332	2.440003	1.520626	0.1353
WARPCOUNT	0.091551	0.034635	2.643290	0.0113
WOOLP	–0.013091	0.019336	–0.677043	0.5018

R-squared	0.137938	Mean dependent var	9.485186
Adjusted R-squared	0.099624	S.D. dependent var	1.116631
S.E. of regression	1.059551	Akaike info criterion	3.014028
Sum squared resid.	50.51914	Schwarz criterion	3.130978
Log likelihood	–69.33668	F-statistic	3.600197
Durbin-Watson stat.	1.721762	Prob(F-statistic)	0.035450

Appendix Table 2.8.2 Variable spinning cost — alternative approach

Dependent Variable: UVNDCOST
Method: Least Squares
Date: 11/16/04 Time: 15:10
Sample: 1 48
Included observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.728175	1.972074	1.890485	0.0651
WARPCOUNT	0.064527	0.027993	2.305111	0.0258
WOOLP	–0.003052	0.015628	–0.195316	0.8460

R-squared	0.117896	Mean dependent var	8.322512
Adjusted R-squared	0.078691	S.D. dependent var	0.892179
S.E. of regression	0.856356	Akaike info criterion	2.588201
Sum squared resid.	33.00058	Schwarz criterion	2.705151
Log likelihood	–59.11683	F-statistic	3.007186
Durbin-Watson stat.	1.937506	Prob(F-statistic)	0.059457

Appendix Table 2.8.3 Labour spinning cost — alternative approach

Dependent Variable:	ULCOST
Method:	Least Squares
Date:	11/16/04 Time: 15:11
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.090862	1.453975	0.750262	0.4570
WARPCOUNT	0.057223	0.020639	2.772582	0.0081
WOOLP	–0.016375	0.011522	–1.421210	0.1621

R-squared	0.147331	Mean dependent var	4.004982
Adjusted R-squared	0.109434	S.D. dependent var	0.669045
S.E. of regression	0.631377	Akaike info criterion	1.978633
Sum squared resid.	17.93864	Schwarz criterion	2.095583
Log likelihood	–44.48719	F-statistic	3.887716
Durbin-Watson stat.	1.614080	Prob(F-statistic)	0.027706

Appendix Table 2.8.4 Electricity spinning cost — alternative approach

Dependent Variable:	UELCOST
Method:	Least Squares
Date:	11/16/04 Time: 15:13
Sample:	1 48
Included observations:	48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.729607	1.211197	2.253644	0.0291
WARPCOUNT	0.008463	0.017193	0.492252	0.6249
WOOLP	0.008917	0.009598	0.928997	0.3578

R-squared	0.038343	Mean dependent var	4.122987
Adjusted R-squared	–0.004397	S.D. dependent var	0.524800
S.E. of regression	0.525952	Akaike info criterion	1.613249
Sum squared resid.	12.44816	Schwarz criterion	1.730199
Log likelihood	–35.71797	F-statistic	0.897122
Durbin-Watson stat.	1.098082	Prob(F-statistic)	0.414908

Appendix 3 Yield regressions

Appendix 3.1 Finishing yield regressions

Appendix Table 3.1.1 Finishing yield regression: 2003 and for product throughputs greater than 1000

Dependent Variable:	YIELD
Method:	Least Squares
Date:	11/11/04 Time: 23:37
Sample (adjusted):	2 2954 IF THROUGHPUT >1000
Included observations:	1100
Excluded observations:	3 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	96.49633	0.457636	210.8583	0.0000
THROUGHPUT	1.21E-05	1.31E-05	0.924663	0.3553
WEIGHT	–0.002932	0.001497	–1.958356	0.0504
WOOLPER	–0.003706	0.002991	–1.238742	0.2157
TYPE2	–0.112253	0.122178	–0.918766	0.3584
TYPE3	0.355498	0.178883	1.987326	0.0471

R-squared	0.016451	Mean dependent var	95.40030
Adjusted R-squared	0.011956	S.D. dependent var	1.615602
S.E. of regression	1.605915	Akaike info criterion	3.790704
Sum squared resid.	2821.386	Schwarz criterion	3.817994
Log likelihood	–2078.887	F-statistic	3.659621
Durbin-Watson stat.	1.413489	Prob(F-statistic)	0.002739

Appendix 3.2 Weaving yield regressions

Appendix Table 3.2.1 Weaving yield regression: 2000

Dependent Variable:	YIELD
Method:	Least Squares
Date:	10/24/03 Time: 12:53
Sample (adjusted):	1165 1710 IF YEAR2000=1
Included observations:	546 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	97.92729	0.157957	619.9619	0.0000
SAMEWARPWEFT	–0.117327	0.055084	–2.129950	0.0336
WARPCOUNT	–0.004713	0.002261	–2.084409	0.0376
WEFTCOUNT	0.004498	0.001595	2.819950	0.0050
WEFTDEN	–0.000530	0.000477	–1.109742	0.2676
WEIGHT	–0.001069	0.000447	–2.390427	0.0172
WOOLPER	0.001040	0.000947	1.098329	0.2726

R-squared	0.037681	Mean dependent var	97.42070
Adjusted R-squared	0.026969	S.D. dependent var	0.418157
S.E. of regression	0.412480	Akaike info criterion	1.079479
Sum squared resid.	91.70527	Schwarz criterion	1.134641
Log likelihood	–287.6977	F-statistic	3.517565
Durbin-Watson stat.	0.094181	Prob(F-statistic)	0.002010

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Appendix Table 3.2.2 Weaving yield regression: 2001

Dependent Variable:	YIELD
Method:	Least Squares
Date:	10/24/03 Time: 13:00
Sample (adjusted):	1 434 IF YEAR2001=1
Included observations:	433 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	96.68807	0.319921	302.2244	0.0000
SAMEWARPWEFT	0.048119	0.114020	0.422020	0.6732
WARPCOUNT	0.008286	0.003538	2.341944	0.0196
WEFTCOUNT	–0.001338	0.003272	–0.408895	0.6828
WEFTDEN	–0.001087	0.000810	–1.341498	0.1805
WEIGHT	0.001712	0.000787	2.175898	0.0301
WOOLPER	–0.000701	0.001669	–0.420099	0.6746

R-squared	0.026379	Mean dependent var	97.31894
Adjusted R-squared	0.012666	S.D. dependent var	0.564835
S.E. of regression	0.561247	Akaike info criterion	1.698721
Sum squared resid.	134.1890	Schwarz criterion	1.764530
Log likelihood	–360.7731	F-statistic	1.923667
Durbin-Watson stat.	1.882387	Prob(F-statistic)	0.075648

Appendix Table 3.2.3 Weaving yield regression: 2002

Dependent Variable:	YIELD
Method:	Least Squares
Date:	10/29/03 Time: 10:22
Sample (adjusted):	435 1164 IF YEAR2002=1
Included observations:	729 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	97.16534	0.389169	249.6738	0.0000
SAMEWARPWEFT	0.136422	0.136629	0.998489	0.3184
WARPCOUNT	0.000532	0.004700	0.113219	0.9099
WEFTCOUNT	–0.000931	0.004518	–0.205992	0.8369
WEFTDEN	0.000650	0.000762	0.853821	0.3935
WEIGHT	–0.000896	0.000999	–0.897489	0.3698
WOOLPER	0.001076	0.001673	0.642992	0.5204

R-squared	0.005328	Mean dependent var	97.24246
Adjusted R-squared	–0.002938	S.D. dependent var	0.813264
S.E. of regression	0.814458	Akaike info criterion	2.436969
Sum squared resid.	478.9331	Schwarz criterion	2.481059
Log likelihood	–881.2750	F-statistic	0.644517
Durbin-Watson stat.	1.839478	Prob(F-statistic)	0.694608

Appendix Table 3.2.4 Weaving yield regression: 2003

Dependent Variable:	YIELD
Method:	Least Squares
Date:	11/29/04 Time: 11:27
Sample (adjusted):	1711 3484 IF YEAR2003=1
Included observations:	1772 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	97.46085	0.038797	2512.045	0.0000
SAMEWARPWEFT	–0.011834	0.011904	–0.994142	0.3203
WARPCOUNT	0.000142	0.000427	0.332865	0.7393
WEFTCOUNT	0.000123	0.000342	0.358639	0.7199
WEFTDEN	–0.000104	9.06E-05	–1.147844	0.2512
WEIGHT	9.95E-05	0.000114	0.874331	0.3821
WOOLPER	–0.000419	0.000201	–2.081719	0.0375

R-squared	0.003720	Mean dependent var	97.43143
Adjusted R-squared	0.000333	S.D. dependent var	0.135673
S.E. of regression	0.135651	Akaike info criterion	–1.153527
Sum squared resid.	32.47789	Schwarz criterion	–1.131879
Log likelihood	1029.025	F-statistic	1.098348
Durbin-Watson stat.	0.026263	Prob(F-statistic)	0.360908

Appendix 3.3 Spinning yield regressions

Appendix Table 3.3.1 Spinning yield regression: 2000

Dependent Variable:	YIELD
Method:	Least Squares
Date:	10/24/03 Time: 13:32
Sample (adjusted):	1036 1402 IF YEAR2000=1
Included observations:	367 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	94.96660	1.417050	67.01712	0.0000
THROUGHPUT	0.000107	4.07E-05	2.637922	0.0087
WOOLP	–0.008304	0.005177	–1.603844	0.1096
WARPCOUNT	0.000455	0.018539	0.024556	0.9804
WARPTWIST	0.002884	0.003196	0.902551	0.3674
WEFTCOUNT	–0.015711	0.008079	–1.944667	0.0526
WEFTTWIST	–0.000622	0.001694	–0.367387	0.7135
ZSZTWIST	0.199308	0.263033	0.757733	0.4491

R-squared	0.057375	Mean dependent var	95.65886
Adjusted R-squared	0.038995	S.D. dependent var	1.763479
S.E. of regression	1.728754	Akaike info criterion	3.954236
Sum squared resid.	1072.904	Schwarz criterion	4.039367
Log likelihood	–717.6024	F-statistic	3.121612
Durbin-Watson stat.	2.131353	Prob(F-statistic)	0.003274

Appendix Table 3.3.2 Spinning yield regression: 2001

Dependent Variable:	YIELD
Method:	Least Squares
Date:	10/24/03 Time: 13:36
Sample (adjusted):	1 379 IF YEAR2001=1
Included observations:	379 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	100.2910	0.821955	122.0152	0.0000
THROUGHPUT	–6.83E-06	3.90E-05	–0.175092	0.8611
WOOLP	–0.012938	0.005281	–2.449856	0.0148
WARPCOUNT	–0.076482	0.013520	–5.656842	0.0000
WEFTCOUNT	0.005001	0.007702	0.649285	0.5166
WARPTWIST	0.001162	0.001501	0.774251	0.4393
WEFTTWIST	–0.000196	0.001319	–0.148937	0.8817
ZSZTWIST	0.240376	0.304630	0.789075	0.4306

R-squared	0.220668	Mean dependent var	94.58011
Adjusted R-squared	0.205963	S.D. dependent var	1.864331
S.E. of regression	1.661282	Akaike info criterion	3.873939
Sum squared resid.	1023.907	Schwarz criterion	3.957053
Log likelihood	–726.1114	F-statistic	15.00692
Durbin-Watson stat.	1.965080	Prob(F-statistic)	0.000000

Appendix Table 3.3.3 Spinning yield regression (2 variable): 2001

Dependent Variable:	YIELD
Method:	Least Squares
Date:	10/29/03 Time: 11:39
Sample (adjusted):	1 379 IF YEAR2001=1
Included observations:	379 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	100.5577	0.705691	142.4954	0.0000
WOOLP	–0.012580	0.004863	–2.586858	0.0101
WARPCOUNT	–0.065465	0.006389	–10.24568	0.0000

R-squared	0.218472	Mean dependent var	94.58011
Adjusted R-squared	0.214315	S.D. dependent var	1.864331
S.E. of regression	1.652522	Akaike info criterion	3.850367
Sum squared resid.	1026.792	Schwarz criterion	3.881535
Log likelihood	–726.6445	F-statistic	52.55433
Durbin-Watson stat.	1.968008	Prob(F-statistic)	0.000000

Appendix Table 3.3.4 Spinning yield regression: 2002

Dependent Variable:	YIELD
Method:	Least Squares
Date:	10/24/03 Time: 13:41
Sample (adjusted):	380 1035 IF YEAR2002=1
Included observations:	656 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	97.67034	0.990909	98.56636	0.0000
THROUGHPUT	0.000159	4.95E-05	3.208602	0.0014
WOOLP	–0.021313	0.005707	–3.734241	0.0002
WARPCOUNT	–0.023188	0.012586	–1.842333	0.0659
WEFTCOUNT	0.000430	0.009115	0.047230	0.9623
WARPTWIST	0.000769	0.001239	0.620645	0.5351
WEFTTWIST	–0.000567	0.001264	–0.448580	0.6539
ZSZTWIST	0.352890	0.303640	1.162199	0.2456

R-squared	0.049185	Mean dependent var	94.49848
Adjusted R-squared	0.038914	S.D. dependent var	2.135233
S.E. of regression	2.093276	Akaike info criterion	4.327458
Sum squared resid.	2839.410	Schwarz criterion	4.382167
Log likelihood	–1411.406	F-statistic	4.788640
Durbin-Watson stat.	1.735156	Prob(F-statistic)	0.000029

Appendix Table 3.3.5 Spinning yield regression: 2003

Dependent Variable:	YIELD
Method:	Least Squares
Date:	11/23/04 Time: 15:12
Sample (adjusted):	1403 2832 IF YEAR2003=1
Included observations:	1428 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	90.24032	3.089796	29.20591	0.0000
THROUGHPUT	0.000432	0.000136	3.173745	0.0015
WOOLP	–0.013692	0.010425	–1.313302	0.1893
WARPCOUNT	–0.024832	0.038399	–0.646675	0.5179
WEFTCOUNT	–0.014147	0.018429	–0.767661	0.4428
WARPTWIST	0.015273	0.007905	1.932099	0.0535
WEFTTWIST	–0.005440	0.003624	–1.500807	0.1336
ZSZTWIST	1.399714	0.839649	1.667022	0.0957

R-squared	0.019285	Mean dependent var	94.27591
Adjusted R-squared	0.014450	S.D. dependent var	5.841274
S.E. of regression	5.798916	Akaike info criterion	6.358806
Sum squared resid.	47750.95	Schwarz criterion	6.388296
Log likelihood	–4532.187	F-statistic	3.989009
Durbin-Watson stat.	1.876560	Prob(F-statistic)	0.000249

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Appendix 3.4 Recombing/dyeing regressions

Appendix Table 3.4.1 Recombing/dyeing yield regression: 2000

Dependent Variable:	YIELD
Method:	Least Squares
Date:	10/24/03 Time: 15:24
Sample (adjusted):	1160 1647 IF YEAR2000=1
Included observations:	487 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	96.91227	0.801353	120.9358	0.0000
THROUGHPUT	8.53E-05	2.18E-05	3.918584	0.0001
WOOLPER	0.000847	0.005659	0.149678	0.8811
COUNT	–0.001197	0.011503	–0.104042	0.9172

R-squared	0.031147	Mean dependent var	97.09959
Adjusted R-squared	0.025129	S.D. dependent var	2.263105
S.E. of regression	2.234489	Akaike info criterion	4.454082
Sum squared resid.	2411.591	Schwarz criterion	4.488483
Log likelihood	–1080.569	F-statistic	5.175878
Durbin-Watson stat.	1.430573	Prob(F-statistic)	0.001578

Appendix Table 3.4.2 Recombing/dyeing yield regression: 2001

Dependent Variable:	YIELD
Method:	Least Squares
Date:	10/24/03 Time: 15:26
Sample (adjusted):	689 1159 IF YEAR2001=1
Included observations:	469 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	98.30391	0.315321	311.7578	0.0000
THROUGHPUT	6.69E-06	1.00E-05	0.668377	0.5042
COUNT	–0.007066	0.004505	–1.568348	0.1175
WOOLPER	–0.000418	0.002113	–0.197894	0.8432

R-squared	0.008595	Mean dependent var	97.77350
Adjusted R-squared	0.002198	S.D. dependent var	0.795620
S.E. of regression	0.794745	Akaike info criterion	2.386900
Sum squared resid.	293.7028	Schwarz criterion	2.422300
Log likelihood	–555.7281	F-statistic	1.343696
Durbin-Watson stat.	1.366054	Prob(F-statistic)	0.259524

Appendix Table 3.4.3 Recombing/dyeing yield regression: 2002

Dependent Variable:	YIELD
Method:	Least Squares
Date:	10/24/03 Time: 15:28
Sample (adjusted):	1 688 IF YEAR2002=1
Included observations:	687 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	97.92801	0.272105	359.8902	0.0000
THROUGHPUT	7.75E-06	1.50E-05	0.516235	0.6059
COUNT	–0.002567	0.003874	–0.662625	0.5078
WOOLPER	0.000152	0.002213	0.068730	0.9452

R-squared	0.001234	Mean dependent var	97.76185
Adjusted R-squared	–0.003153	S.D. dependent var	0.934757
S.E. of regression	0.936229	Akaike info criterion	2.711892
Sum squared resid.	598.6665	Schwarz criterion	2.738281
Log likelihood	–927.5350	F-statistic	0.281355
Durbin-Watson stat.	1.798365	Prob(F-statistic)	0.838878

Appendix Table 3.4.4 Recombing/dyeing yield regression: 2003

Dependent Variable:	YIELD
Method:	Least Squares
Date:	11/29/04 Time: 16:21
Sample (adjusted):	1646 2832 IF YEAR2003=1
Included observations:	1185 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	98.13913	0.268985	364.8492	0.0000
COUNT	0.003544	0.003606	0.982860	0.3259
WOOLPER	–0.006094	0.002027	–3.006705	0.0027
THROUGHPUT	2.40E-05	1.47E-05	1.635054	0.1023

R-squared	0.009324	Mean dependent var	97.89857
Adjusted R-squared	0.006808	S.D. dependent var	1.129498
S.E. of regression	1.125646	Akaike info criterion	3.077962
Sum squared resid.	1496.421	Schwarz criterion	3.095101
Log likelihood	–1819.692	F-statistic	3.705181
Durbin-Watson stat.	1.767232	Prob(F-statistic)	0.011363

Appendix 4 Price analyses

Appendix Table 4.1 Hedonic price analysis of Australian wool combed in China

Dependent Variable:	price
Method:	least squares
Date:	05/12/03 Time: 17:06
Sample (adjusted):	310 2499 if Micron<25 And Length>60 and D2000=1
Included observations:	965 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–253.3983	10.31421	–24.56787	0.0000
Micron^–1	6205.667	132.3069	46.90358	0.0000
Length	0.315752	0.067835	4.654707	0.0000
Amount	–0.117209	0.023406	–5.007605	0.0000

R-squared	0.745014	Mean dependent var	54.55544
Adjusted R-squared	0.744218	S.D. dependent var	26.13748
S.E. of regression	13.21901	Akaike info criterion	8.005325
Sum squared resid.	167927.2	Schwarz criterion	8.025520
Log likelihood	–3858.569	F-statistic	935.9438
Durbin-Watson stat.	1.767666	Prob(F-statistic)	0.000000

Appendix Table 4.2 Hedonic price analysis of China wool top

Dependent Variable:	price
Method:	least squares
Date:	05/12/03 Time: 17:26
Sample (adjusted):	431 2753 if D2000=1 and Micron<25 And Length>60
Included observations:	1097 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–73.2992	2.721483	–26.9335	0
Micron^–1	2063.243	47.00774	43.89156	0
Length	0.236115	0.018972	12.44552	0
Amount	–0.00969	0.010494	–0.92376	0.3558

R-squared	0.650643	Mean dependent var	38.7711
Adjusted R-squared	0.649684	S.D. dependent var	5.829396
S.E. of regression	3.450273	Akaike info criterion	5.318424
Sum squared resid.	13011.5	Schwarz criterion	5.336656
Log likelihood	–2913.16	F-statistic	678.5347
Durbin-Watson stat.	1.846364	Prob(F-statistic)	0

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Appendix Table 4.3 Regression analysis of 2002 China wool auction

Dependent Variable: price
Method: least squares
Date: 05/19/03 Time: 13:33
Sample (adjusted): 1 54
Included observations: 53
Excluded observations: 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	47.16873	4.850372	9.724767	0
Micron^–1	–1.05636	0.226834	–4.65696	0
Length	0.151765	0.01839	8.252527	0
Yield	0.079728	0.028288	2.818406	0.007
Bales	0.001664	0.002253	0.738369	0.4639

R-squared	0.743369	Mean dependent var	41.53774
Adjusted R-squared	0.721983	S.D. dependent var	1.931144
S.E. of regression	1.01824	Akaike info criterion	2.963617
Sum squared resid.	49.76705	Schwarz criterion	3.149494
Log likelihood	–73.5359	F-statistic	34.75974
Durbin-Watson stat.	1.413246	Prob(F-statistic)	0

Appendix Table 4.4 Granger Causality tests for monthly wool price data

Pairwise Granger Causality Tests
Date: 05/15/03
Time: 09:03
Sample: 1996: 01 2002: 12
Lags: 2

Null Hypothesis:		Obs	F-Statistic	Probability
TA66C does not Granger Cause GA66	1	82	3.2589	0.04379
GA66 does not Granger Cause TA66C	2		15.9368	1.60E-06
	3			
TA60C does not Granger Cause GA66	4	82	3.3108	0.04175
GA66 does not Granger Cause TA60C	5		8.25491	0.00056
	6			
TA64C does not Granger Cause GA66	7	82	4.29432	0.01706
GA66 does not Granger Cause TA64C	8		8.72083	0.00039
	9			
TA70C does not Granger Cause GA66	10	82	4.98212	0.00923
GA66 does not Granger Cause TA70C	11		1.8659	0.16169
	12			
TC64C does not Granger Cause GA66	13	82	2.86981	0.06279
GA66 does not Granger Cause TC64C	14		6.34442	0.00281
	15			
TC66C does not Granger Cause GA66	16	82	3.45239	0.03665
GA66 does not Granger Cause TC66C	17		14.0217	6.40E-06
	18			
TA60C does not Granger Cause TA66C	19	82	2.92259	0.05979
TA66C does not Granger Cause TA60C	20		3.8685	0.02507
	21			
TA64C does not Granger Cause TA66C	22	82	3.61074	0.0317
TA66C does not Granger Cause TA64C	23		5.01427	0.00897
	24			
TA70C does not Granger Cause TA66C	25	82	4.72241	0.01163
TA66C does not Granger Cause TA70C	26		0.79851	0.45369
	27			

TC64C does not Granger Cause TA66C	28	82	2.76508	0.06923
TA66C does not Granger Cause TC64C	29		0.93127	0.39845
	30			
TC66C does not Granger Cause TA66C	31	82	2.92133	0.05986
TA66C does not Granger Cause TC66C	32		5.58083	0.00545
	33			
TA64C does not Granger Cause TA60C	34	82	1.46845	0.23666
TA60C does not Granger Cause TA64C	35		1.6805	0.19304
	36			
TA70C does not Granger Cause TA60C	37	82	8.1082	0.00064
TA60C does not Granger Cause TA70C	38		2.22782	0.11466
	39			
TC64C does not Granger Cause TA60C	40	82	2.16878	0.12125
TA60C does not Granger Cause TC64C	41		7.39906	0.00115
	42			
TC66C does not Granger Cause TA60C	43	82	5.22929	0.00742
TA60C does not Granger Cause TC66C	44		13.9523	6.70E-06
	45			
TA70C does not Granger Cause TA64C	46	82	7.37295	0.00118
TA64C does not Granger Cause TA70C	47		1.91957	0.15362
	48			
TC64C does not Granger Cause TA64C	49	82	1.98498	0.14435
TA64C does not Granger Cause TC64C	50		6.92073	0.00172
	51			
TC66C does not Granger Cause TA64C	52	82	4.69126	0.01195
TA64C does not Granger Cause TC66C	53		14.9999	3.20E-06
	54			
TC64C does not Granger Cause TA70C	55	82	2.69208	0.07412
TA70C does not Granger Cause TC64C	56		2.37686	0.09962
	57			
TC66C does not Granger Cause TA70C	58	82	2.78575	0.06791
TA70C does not Granger Cause TC66C	59		3.62422	0.03132
	60			
TC66C does not Granger Cause TC64C	61	82	0.55837	0.57444
TC64C does not Granger Cause TC66C	62		4.15878	0.01927

Appendix Table 4.5 Granger Causality tests for weekly wool price data

Pairwise Granger Causality Tests
Date: 05/15/03
Time: 10:39
Sample: 1/07/2000 8/09/2002
Lags: 2

Null Hypothesis:		Obs	F-Statistic	Probability
TA66A does not Granger Cause GU58	63	134	3.06558	0.05004
GU58 does not Granger Cause TA66A	64		0.64976	0.52387
TA66C does not Granger Cause GU58	65	134	8.42225	0.00036
GU58 does not Granger Cause TA66C	66		1.02107	0.3631
TA70C does not Granger Cause GU58	67	134	4.11919	0.01844
GU58 does not Granger Cause TA70C	68		1.53278	0.21984
TA80C does not Granger Cause GU58	69	134	3.07788	0.04945
GU58 does not Granger Cause TA80C	70		0.282	0.75474
TC60C does not Granger Cause GU58	71	134	0.32711	0.7216
GU58 does not Granger Cause TC60C	72		2.95642	0.05554
TC66C does not Granger Cause GU58	73	134	2.72638	0.06923
GU58 does not Granger Cause TC66C	74		6.48956	0.00206
TA64C does not Granger Cause TA60C	75	134	4.30493	0.01549
TA60C does not Granger Cause TA64C	76		6.45423	0.00213
TA66A does not Granger Cause TA60C	77	134	2.09133	0.12769
TA60C does not Granger Cause TA66A	78		7.23628	0.00105
TA66C does not Granger Cause TA60C	79	134	6.10784	0.00292
TA60C does not Granger Cause TA66C	80		5.88975	0.00357
TA70C does not Granger Cause TA60C	81	134	7.38114	0.00092
TA60C does not Granger Cause TA70C	82		5.25802	0.00638
TA80C does not Granger Cause TA60C	83	134	4.63678	0.01136
TA60C does not Granger Cause TA80C	84		2.32033	0.10233
TC60C does not Granger Cause TA60C	85	134	0.61455	0.54246
TA60C does not Granger Cause TC60C	86		1.16885	0.31399
TC66C does not Granger Cause TA60C	87	134	3.41027	0.03604
TA60C does not Granger Cause TC66C	88		15.4791	9.40E-07
TA66A does not Granger Cause TA64C		134	0.97335	0.38057
TA64C does not Granger Cause TA66A	89		17.1236	2.50E-07
TA66C does not Granger Cause TA64C	90	134	11.6121	2.30E-05
TA64C does not Granger Cause TA66C			7.68502	0.0007
TA70C does not Granger Cause TA64C	91	134	11.5451	2.40E-05
TA64C does not Granger Cause TA70C	92		9.19002	0.00019
TA80C does not Granger Cause TA64C	93	134	5.17125	0.00691
TA64C does not Granger Cause TA80C	94		3.21574	0.04336
TC60C does not Granger Cause TA64C	95	134	1.80918	0.16792
TA64C does not Granger Cause TC60C	96		2.90684	0.05824

TC66C does not Granger Cause TA64C	97	134	4.29743	0.0156
TA64C does not Granger Cause TC66C	98		14.8679	1.50E-06
TA66C does not Granger Cause TA66A	99	134	12.2629	1.30E-05
TA66A does not Granger Cause TA66C	100		23.4554	2.00E-09
TA70C does not Granger Cause TA66A	101	134	11.9724	1.70E-05
TA66A does not Granger Cause TA70C	102		4.45905	0.01341
TA80C does not Granger Cause TA66A	103	134	9.42692	0.00015
TA66A does not Granger Cause TA80C	104		3.62346	0.02944
TC60C does not Granger Cause TA66A	105	134	2.58827	0.07905
TA66A does not Granger Cause TC60C	106		3.12611	0.04723
TC66C does not Granger Cause TA66A	107	134	2.54316	0.08255
TA66A does not Granger Cause TC66C	108		14.18	2.70E-06
TA70C does not Granger Cause TA66C	109	134	8.15265	0.00046
TA66C does not Granger Cause TA70C	110		9.60244	0.00013
TA80C does not Granger Cause TA66C	111	134	4.34007	0.01499
TA66C does not Granger Cause TA80C	112		2.71328	0.0701
TC60C does not Granger Cause TA66C	113	134	0.85424	0.428
TA66C does not Granger Cause TC60C	114		2.85339	0.06129
TC66C does not Granger Cause TA66C	115	134	2.77739	0.06592
TA66C does not Granger Cause TC66C	116		25.6626	4.10E-10
TA80C does not Granger Cause TA70C	117	134	1.23149	0.29526
TA70C does not Granger Cause TA80C	118		4.91008	0.00881
TC60C does not Granger Cause TA70C	119	134	0.40682	0.66662
TA70C does not Granger Cause TC60C	120		0.78937	0.45631
TC66C does not Granger Cause TA70C	121	134	1.91014	0.15222
TA70C does not Granger Cause TC66C	122		3.68907	0.02767
TC60C does not Granger Cause TA80C	123	134	1.29561	0.27727
TA80C does not Granger Cause TC60C	124		0.3597	0.69858
TC66C does not Granger Cause TA80C	125	134	1.61763	0.20237
TA80C does not Granger Cause TC66C	126		3.78199	0.02534
TC66C does not Granger Cause TC60C	127	134	2.23904	0.11069
TC60C does not Granger Cause TC66C	128		1.37263	0.25712

Appendix 5
CAEGWOOL tutorial example

1. Create a new folder on your C drive called 'CAEG', that is C:\CAEG. (Alternatively, if you do not have a C drive, create the CAEG folder on another drive).
2. Copy the CAEGWOOLmaster.xls and CAEGsummary.xls files into this C:\CAEG folder.
3. Open the CAEGWOOLmaster.xls file. It will open onto a worksheet called 'CAEGWOOL home' as shown in Appendix Figure 5.1.
4. Click on the 'Front Page' button in the first column of buttons and it will bring you to a sheet called 'front page' as shown in Appendix Figure 5.2.
5. Enter the information shown in the blue cells in Appendix Figure 5.2. That is, in cell C5 for name of summary file enter 'c:\CAEG\CAEGsummary.xls'. Then enter 'C:\CAEG\Fabric run 1' in cell B8 for the name of the model run. Enter a '1' in the blue shaded cells in Column F8 for the finishing, weaving and spinning workshops. Finally to record the final outputs, list the name 'Fabric 1' in cell C12 and 3450 in cell D12 for the amount of the final product in metres.
6. Once all the information has been entered click on the 'product design' macro button at the top of the 'front page' sheet shown in Appendix Figure 5.2.
7. The 'product design' macro will take you to the 'product design' sheet and create a fabric design proforma for fabric 'fabric 1' as shown in Appendix Figure 5.3. Fill in the blue input cells in this proforma with the values shown in Appendix Figure 5.3.
8. Once the information for 'fabric 1' has been entered, click on the 'design yarns' button in cell D3. This will create yarn design proforma for the two yarns specified namely 'warp1' and 'weft1' as shown in Appendix Figure 5.4.
9. Fill in the design information shown in Appendix Figure 5.4 for the two yarns and then click on the 'design finished tops' macro button. This will create the proforma for the two finished tops as shown in Appendix Figure 5.5. (Note that as this example only specified finishing, weaving and spinning workshops both of these finished tops will be purchased rather than manufactured.)
10. Complete the design information for the two finished tops as shown in Appendix Figure 5.5.
11. All of the product design has now been entered (see Appendix Figure 5.6 for the full completed sheet). Return to the 'CAEGWOOL home' sheet by going to the top left hand corner of the 'product design' page (cell A1) and click on the arrow labelled 'Home'.
12. On the 'CAEGWOOL home' sheet, click on the 'Create input sheets' button which will format the remaining input sheets.
13. Click on the 'Price input' button. It will take you to the 'Price input' sheet as shown in Appendix Figure 5.7. Note that the sheet contains blue shaded input cells for the prices of the products specified on the product design sheet. Furthermore, these blue cells contain model determined values for these prices based on the product design. For now, leave these endogenous values as they are specified and return to the 'CAEGWOOL home' sheet by again clicking on the 'Home' arrow in the top left hand corner.
14. Click on the 'Product cost coefficient' button which will take you to the product design sheet as shown in Appendix Figure 5.8. Once again note that blue shaded input cells have been generated for the products specified on the 'product design' sheet and that model determined values have automatically been entered into these cells. Once again leave these model determined values unchanged for the moment and return to the 'CAEGWOOL home' sheet by again clicking on the 'Home' arrow in the top left hand corner.
15. In the same manner as step 13 and 14, click on both the 'Yield coefficients' and 'Overhead cost coefficients' buttons as shown in Figures A5.9 and A5.10 and return to the 'CAEGWOOL home' sheet.
16. Click on the 'Cost input' button which will take you to the 'Cost input' sheet as shown in Appendix Figure 5.11. Enter the information in the blue cells in Sections 1, 2 and 3 of this sheet as shown in Appendix Figure 5.11. Return to the 'CAEGWOOL home' sheet.

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17. Now all of the input information has been entered, so click the 'Create output sheets' button in the third column of buttons. This starts the macro or program that deletes any existing output sheets, performs the calculations, and then generates the new output sheets. You will see the screen flicker as the new sheets are being generated.
18. Finally the screen will come to rest in the CAEGsummary.xls file as shown in Appendix Figure 5.12. As you will see, this sheet records the model name, and both the before and after tax profit. It also sorts the model runs into descending order of profit and highlights the current run with gold shading across the row. However, as this is the first model run only a single row for this model run will appear.
19. Close and save this CAEGsummary.xls file which will then take you to the open 'C:\CAEG\Fabric run 1.xls' file which is the model run.
20. Click on the 'Physical amount' button to take you to the 'physical amounts' sheet as shown in Appendix Figure 5.13. Check out the physical reconciliation between purchased inputs, intermediate inputs and final outputs (based on product design and yield and transformation coefficients) before returning to the 'CAEGWOOL home' sheet via the 'Home' arrow in the top left hand corner of the sheet.
21. Click on the 'Profit' button to take you to the 'profit' sheet as shown in Appendix Figure 5.14. Check out the profit statement (Section 1), contract prices and service fees (Section 2), and net revenue added by workshop (Section 3) before returning to the 'CAEGWOOL home' sheet.
22. Check out one of the workshop specific sheets by clicking on the relevant button in the second series of buttons in the second column of buttons. For instance clicking on the 'Spinning' button will bring you to the 'spinning' sheet as shown in Appendix Figure 5.15.
23. Check out the other output sheets, namely 'cost details', 'revenue details', intermediate prices', 'finishing' and 'weaving' in the same manner.
24. Click on the 'front page' button to go to the 'front page' sheet and change the name of the model run from 'c:\caeg\Fabric Run 1' to 'c:\caeg\Fabric Run 2 low prices'. Then return to the 'CAEGWOOL home' sheet.
25. Click on the 'Price input' sheet to go to the 'Price input' sheet and change the prices in the blue cells for the finished fabric and the ecru fabric as shown in Appendix Figure 5.16. Return to the 'CAEGWOOL home' sheet.
26. Click on the 'Create output sheets' button to run the model again with the new (lower) fabric prices. As this program deletes the existing output sheets, the automatic *Microsoft Excel* warning message for deleting worksheets as shown in Appendix Figure 5.17 will appear. Click on 'OK' as this message appears for the various output sheets.
27. After re-performing the calculations and generating the new output sheets, the screen will come to rest on a revised CAEGsummary.xls file as shown in Appendix Figure 5.18. Compare this sheet with the one shown in Appendix Figure 5.12. Note that the latest model run ('c:\caeg\Fabric Run 2 low prices.xls') is highlighted and is also on the bottom row as its profit is lower than that for 'C:\CAEG\Fabric run 1.xls'.
28. Close and save this CAEGsummary.xls file which will then take you to the open 'C:\CAEG\Fabric Run 2 low prices.xls' file which is the model run.
29. Click on the 'Profit' button to take you to the 'Profit' sheet to show you the new profit statement for this model run with lower fabric prices (as shown in Appendix Figure 5.19). Return to the 'CAEGWOOL home' sheet.
30. Click on the 'Intermediate prices' button to take you to the 'Intermediate prices' sheet as shown in Appendix Figure 5.20. Note that because the market price (net of VAT input rebate) is now lower than the cost of producing the ecru fabric in the mill, that the row for this ecru fabric is now highlighted in gold instead of in green (as it was in the previous model run).
31. Check out the other output sheets via the 'CAEGWOOL home' sheet.
32. Consider undertaking new model runs. If you would like to finish the session, simply close the current file ('C:\caeg\Fabric Run 2 low prices.xls').
33. New sessions can be started by opening the original 'C:\CAEGWOOLmaster.xls), file if a completely new product design is being considered; or alternatively by opening the 'C:\caeg\Fabric Run 2 low prices.xls' file if modifications to the previous model run are being considered.

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