Lumber versus Log Import Estimator User's Guide

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The LUMBER VERSUS LOG IMPORT ESTIMATOR was designed to provide a mechanism to consider and to compare the opportunities of foreign manufacturers to import U.S. manufactured lumber instead of purchasing U.S. logs. The estimator is a personal computer spreadsheet program that outputs data based on three other spreadsheet programs/modules: PROYIELD, CONVERT, and CONTAINER ESTIMATOR, all of which are included with the LUMBER VERSUS LOG IMPORT ESTIMATOR.

The support and assistance of Scott Bowe UW-Madison, Terry Mace, Don Peterson and also John Dramm of the USFS in development and review of this program is gratefully acknowledged. This version of the spreadsheet includes advanced modifications completed in May 2013. This spreadsheet program and the PROYIELD, and CONVERT spreadsheets included as linked modules in this program were developed by: Bob Govett, College of Natural Resources, University of Wisconsin-Stevens Point, Stevens Point WI 54481. Contact information: phone: 715-346-4212; email: rgovett@uwsp.edu.

General Instructions for all Modules

With the initial design and continued development of LUMBER VERSUS LOG IMPORT ESTIMATOR, PROYIELD, CONVERT, AND CONTAINER ESTIMATOR, an underlying objective has always been to allow easy changes and modification by experienced and knowledgeable users. **No cell protection is set within any of the spreadsheets.** This lack of protection being set enables you to "click on" any cell to view the functions and/or formulas it contains, so you can understand how it operates. Without cell protection set, it is easily possible for a careless user to inadvertently enter data in a cell that is not designed for the entry of data and doing so will overwrite functions/formulae within the cell. If you wish to set protection so functions and formulae can't be overwritten, use the pull-down menus "Tools", then "Protection." (See the "Help" menu for explanation of the use of protection; you will need to "unprotect" cells to make entries in those cells.)

Modification of the spreadsheets in any fashion should only be undertaken by someone with superior knowledge of the topic, program logic, and spreadsheet programming. In attempts to modify or customize the modules it is prudent that you do not delete rows, columns, or cells as that may affect other parts of the spreadsheets. It is recommended that any modification or customization of the modules for your own purposes be done by adding rows to the bottom of the spreadsheet. For assistance in using any of the modules, contact Bob Govett.

PROYIELD & CONVERT MODULES

The PROYIELD and CONVERT modules, in various forms and formats, contained within this spreadsheet program have been successfully used "as-is" or with slight modifications in both commercial sawmill feasibility analysis and instruction for several years.

USING THE PROYIELD MODULE

A detailed manual for use of the PROYIELD module of this spreadsheet program can be found at: http://www.fwe.wisc.edu/files/forestry_extension_project_files/Manual_PROYIELD.pdf.

USING THE CONVERT MODULE

CONVERT is a personal computer spreadsheet program for conversions between common board foot log rules and cubic volume. This program was designed to provide conversion information in common board foot log rules and cubic volumes, for individual logs (of various diameters and lengths) and for representative log sample distributions.

The only data entry required of the user for this module of the program is the log distribution (diameter/length distribution) to be considered in aggregation as a representative sample. The user enters the number of logs in each of the cells in the diameter/length matrix, ensuring entries of "0" are entered for cells with diameter/length combinations that are not included.

The data entry in this matrix is required to get meaningful results for the distribution in the various scales. If the user is not interested in information regarding an aggregate sample, no data needs to be entered. Conversions between scales on a log by log basis, are contained in the spreadsheet. These data may be most easily found by first scrolling down to the base scale of interest (e.g. Scribner Decimal C), then scrolling across to see conversions from that base scale to other board foot scales and volume scales.

An example of this data entry follows:

	ENTER LOG DIAMETER/LENGTH DISTRIBUTION BEING CONSIDERED													
	(enter the number of logs in each diameter by length category)													
	Log								by					
	Small	e>>	e>>	e>>	e>>	e>>	e>>	e>>	diameter					
	End	LOG LENGTH IN FEET							log					
	d.i.b."	8	10	12	14	16	18	20	Totals					
e>>	6	0	0	0	0	0	0	0	0					
e>>	7	0	0	0	0	0	0	0	0					
e>>	8	0	0	0	0	0	0	0	0					
e>>	9	0	0	0	0	0	0	0	0					
e>>	10	0	0	0	0	0	0	0	0					
e>>	11	0	0	0	0	0	0	0	0					
e>>	12	0	0	0	0	0	0	0	0					
e>>	13	0	0	0	0	0	0	0	0					
e>>	14	0	0	0	0	0	0	0	0					
e>>	15	0	0	0	0	0	0	0	0					
e>>	16	0	0	0	0	0	0	0	0					
e>>	17	0	0	0	0	0	0	0	0					
e>>	18	0	0	0	0	0	0	0	0					
e>>	19	0	1	1	0	0	0	0	2					
e>>	20	0	2	2	0	0	0	0	4					
e>>	21	0	3	3	0	0	0	0	6					
e>>	22	0	3	3	0	0	0	0	6					
e>>	23	0	4	4	0	0	0	0	8					
e>>	24	0	4	4	0	0	0	0	8					
e>>	25	0	3	3	0	0	0	0	6					
e>>	26	0	2	2	0	0	0	0	4					
e>>	27	0	2	2	0	0	0	0	4					
e>>	28	0	1	1	0	0	0	0	2					
e>>	29	0	0	0	0	0	0	0	0					
e>>	30	0	0	0	0	0	0	0	0					
e>>	31	0	0	0	0	0	0	0	0					
e>>	32	0	0	0	0	0	0	0	0					
e>>	33	0	0	0	0	0	0	0	0					
e>>	34	0	0	0	0	0	0	0	0					
e>>	35	0	0	0	0	0	0	0	0					
e>>	36	0	0	0	0	0	0	0	0					
	by length													
	Totals	0	25	25	0	0	0	0	50		<<TOTAL LOGS IN DISTRIBUTION			
	OVERALL SCALE SUMMARY FOR THE LOG DIAMETER/LENGTH DISTRIBUTION ENTERED													
	Total scale in Bd. Ft Scribner Decimal C Log Rule =								13,520					
	Total scale in Bd. Ft International 1/4 Log Rule =								13,625					
	Total scale in Bd. Ft Doyle Log Rule =								13,135					
	Total scale in Expanded Scribner Log Rule =								13,600					
	Total scale volume in cubic feet =								1,759.1					
	Total scale volume in cubic meters =								49.82					

USING THE CONTAINER ESTIMATOR AND THE LUMBER VERSUS LOG IMPORT ESTIMATOR

Many of the assumptions required for the spreadsheets are already estimated for you, and you can use those coached estimates as "default values", or you can adjust them in any way, based on your situation.

As is indicated in the spreadsheets for the Log vs Lumber Import Estimator and Container Estimator Modules and for the diameter distribution within the Convert Module (when that is used), red italics are used for cells which require a user entry. In many cases reasonable estimates are provided by the modules (when used) or by additional information provided within the module itself (e.g. hardwood lumber grade/yield estimates within the Lumber vs Log Import Estimator module), For example:

This is "flagged" early within the model as:

NOTE: The user is to enter assumptions for analysis in cells that are shown in red italic characters.
NOTE: Where the CONVERT and PROYIELD modules are used for estimations, key information will be pulled from those programs and displayed in blue.
NOTE: Additional hardwood lumber grade/yield summary information to use as a starting point in making estimations is also displayed in blue - these are taken from the USFS Research Paper NE-468 dated 1980.

To illustrate the conventions used within the modules, the following example from within the Log vs Lumber Import Estimator Module is provided:

Species being considered		*White Oak lumber in a 10/4 size as compared to premium white oak logs*						
Log Grade	Log price	(Note: Price is for the log in United States with no shipping costs - in this example, log price premiums are paid for premium mix of larger diam						
F1	*$600.00*	price is in U.S. $/MBF log scale in United States						
F2	*$450.00*	price is in U.S. $/MBF log scale in United States						
F3	*$300.00*	price is in U.S. $/MBF log scale in United States						
Board foot yield per MBF log scale estimated for diameter distribution and cutting scenario considered =						*1066*		
From PROYIELD module - the board foot yield per MBF log scale estimated for diameter distribution and cutting scenario considered was =								1066
	This is equivalent to an overrun of		6.6%					
					Scribner	International		Expanded
Estimated cubic feet of logs per MBF log scale =			*130.1*		Decimal C	1/4 rule	Doyle	Scribner
From CONVERT module, the estimated cubic feet of logs per MBF log scale was =					130.1	129.1	133.9	129.3
Estimated cubic meters of logs per MBF log scale =			*3.68*					
From CONVERT module, the Estimated cubic meters of logs per MBF log scale was =					3.68	3.66	3.79	3.66
Estimated board feet of log scale per cubic foot of logs =			7.7					
Estimated board feet of log scale per cubic meter of logs =			271.4					
Estimated board feet of lumber recovered per cubic foot of logs =				8.2				
Estimated board feet of lumber recovered per cubic meter of logs =				289.3				

In this example, the user enters in log price by grade, and then enters expected yield of 1,066 board feet of lumber per MBF (1,000 board feet) of log input, which, in this case, is an estimate "coached" from the PROYIELD module. The user also enters conversion estimates of cubic feet of logs per MBF and cubic meters, in this case these values are as "coached" by the Convert module for the log distribution and the appropriate scale.

The example contained within the module considers a manufacturer in India considering purchase of U.S. produced hardwood lumber versus U.S. hardwood logs. The species in the

example is white oak, and it is considered that either the U.S. sawmill will saw, then dry and ship the lumber in a dry and rough condition or that the Indian manufacturer will import and saw the logs. In the example, the size produced is a random width nominal 10/4 produced to actual green rough thickness of 2 5/8 inches (2.625 inches), which after drying to 12% MC would be approximately 2.46 to 2.54 inches in thickness. The U.S. manufacturer producing for export would be producing grades of Select & Better, #1 Common and #2A Common for the export market and resawing (green) lower grade for domestic market in 4/4 sizes. The lumber price (delivered) for the Indian producer allows for direct comparison to the log prices with associated shipment and manufacturing costs necessary for the importer to produce the lumber. Yield estimates are made using the PROYIELD program module set to model a typical small band sawmill in India sawing the size and type of lumber being considered. The CONVERT program module considers a sample log mix of fairly large diameter logs (19 inch to 28 inch) in lengths of 10 and 12 feet which would be preferred for this production and premium prices are assumed. NOTE: THIS IS DESIGNED AS A HYPOTHETICAL EXAMPLE ONLY - IT DEMONSTRATES HOW THE PROGRAM CAN HANDLE SOMEWHAT UNUSUAL US EXPORT OPPORTUNITY IN ANALYSIS - IT IS NOT DESIGNED TO REFLECT ACTUAL MARKET PRICES.

CONTAINER ESTIMATOR

The Container Estimator Module for the Lumber versus Log Import Estimator is a personal computer spreadsheet program to compare lumber versus log import opportunities. This program was designed to provide a mechanism to consider and to compare the opportunities of foreign manufacturers to import U.S. manufactured lumber instead of purchasing U.S. logs. This module was designed to develop estimates of volume of lumber and the volume of logs of various species which could be put into containers of various sizes based on volume or weight constraints, which provides an estimate of shipping costs on a per MBF unit (versus simply total cost for the container). This facilitates the estimation of comparisons between shipping logs and lumber. A simple and useful illustration provided by the module is the estimation of the number of containers of logs of various grades which would be required to recover the equivalent of a container of mill-run #2 and Better lumber, or the number of containers of any log grade required to recover a the equivalent of a container equivalent of mill-run lumber of all grades.

As an example of this output is as follows:

Assuming lumber to be shipped is a mill-run mix of #2 and Better grades recovered from the log distribution that was assumed				
As estimated from the PROYIELD module, the volume of lumber recovered per MBF of log input was = 1,066		Grade #1 logs	Grade #2 logs	Grade #3 logs
As estimated from the Lumber vs Log Import Estimator, the % of #2 and Better to be recovered from assumed log mix was =		57.0%	46.0%	29.0%
		Grade #1 logs	Grade #2 logs	Grade #3 logs
Therefore the approximate volume of lumber in Grades #2 and Better per MBF of the log mix assumed would be about =		0.608	0.490	0.309
Therefore the approximate MBF volume of logs in the various log grades to recover 1 MBF of #2 and Better lumber would be about =		1.645	2.039	3.234
Therefore the approximate number of containers of logs to recover 1 mill run container full of #2 and Better lumber would be about =		4.0	5.0	7.9
Assuming lumber to be shipped is a mill-run mix of all grades recovered from the log distribution that was assumed				
As estimated from the PROYIELD module, the board foot volume of lumber recovered per MBF of log input was = 1,066				
		Logs of all grades		
Therefore the approximate volume of lumber in all grades per MBF of the log mix assumed would be about =		1.066		
Therefore the approximate MBF volume of logs in the various log grades to recover 1 MBF of mill run lumber (all grades) would be about =		0.938		
So the approximate number of containers of logs to recover 1 mill run container full of mill run mix of all grades of lumber would be about =		2.3		

The module begins with estimating container shipments of lumber, followed by estimates for container shipment of logs. It estimates the volume of lumber that could be put into a container of dimensions provided by the user, based on volume constraints (associated with those dimensions) and weight constraints (which are a function of weight limits provided by the user and appropriate weights for the lumber.)

Estimator for container shipment of lumber:

The following is an example of the estimator for container shipment of lumber, within this, red entries are made by the user, in some cases "coached" by blue entries, where black entries are labels or are calculated:

Estimator for container shipment of lumber							
				Estimated			
ESTIMATE OF CUBIC FOOT VOLUME IN CONTAINER				Approximate			
What are approximate container interior dimensions in feet?				Cubic			
	Length?	Width?	Height?	Volume			
enter in feet >	*39.5*	*7.67*	*7.75*	2,348	< in cubic feet		
meters >	12.04	2.34	2.36	66.5	< in cubic meters		
What do you wish to assume is the usable/loadable cubic volume in the container? (in cubic feet)						*2,000*	
This assumption is equivalent to a usable cubic volume in the container in cubic meters of =						56.6	
							Weight in
ESTIMATE OF MAXIMUM SHIPMENT WEIGHT OF LUMBER IN CONTAINER							kilos
What is the estimated tare weight in pounds of container? (estimated empty weight?)						*6,800*	3,084
What is the maximum weight of container for shipment? (e.g. likely the truck weight limit?)						*60,000*	27,216
Estimated maximum weight of lumber that could be loaded into container						53,200	24,131
What is estimated weight in pounds per MBF of lumber to be shipped?						*3,850*	1,746
Estimated maximum volume of lumber in MBF in container at weight limit						13.82	
From PROYIELD module the estimated cubic feet of green rough lumber per MBF lumber is =						87.5	
Liberal estimate of cubic volume (in cubic feet) of lumber at weight capacity is =						1,209	
Liberal estimate of cubic volume (in cubic meters) of lumber at weight capacity is =						34.2	
Approximate percentage of the container's cubic volume that is occupied by lumber =						60%	
What do you wish to estimate is the volume in MBF of lumber to be loaded into the container ?						*13.82*	
What is the total cost (in U.S. dollars) of shipping the container?						$4,000.00	
Calculated approximate cost (in U.S. dollars) of shipping lumber in container per MBF lumber shipped.						$289.47	

As should be noted, key calculations include an estimate of the board foot volume of lumber which can be loaded into the container (which is highly variable based upon various factors such as species, size, etc.) and a translation of the container shipping cost from a $/container to a $/MBF equivalent.

A similar calculation is made for logs, resulting in the following as an example:

Given your assumption of the average density of logs in pounds per cubic foot of =	**60.0**
and given your estimate of the combined wood and bark volume in cubic feet per MBF log input of =	**156.6**
your log distribution has an estimated average weight of pounds per MBF log scale shipped =	**9395**
What is estimated weight in pounds per MBF of logs to be shipped?	***9,395***
Estimated maximum volume of logs in MBF in container at weight limit	**5.66**
What do you wish to estimate is the volume in MBF of logs to be loaded into the container ?	***5.66***
General estimate of actual cubic volume (in cubic feet) of logs (wood and bark) at weight capacity is =	**887**
Approximate percentage of the container's cubic volume that is physically occupied by logs =	**44%**
General estimate of cubic volume (in cubic feet) of logs with air space at weight capacity is =	**1241**
General estimate of cubic volume (in cubic meters) of logs with air space at weight capacity is =	**35.16**
Approximate % of the container's cubic volume that is occupied by logs and air space between logs =	**62%**
What is the total cost of shipping the container? (cost in dollars)	**$4,000.00**
Calculated approximate cost of shipping logs in container per MBF logs shipped.	**$706.41**

LUMBER VERSUS LOG IMPORT ESTIMATOR MODULE

As noted prior in an example of data entry conventions used within the model, the Log vs Lumber Import Estimator Module was established as an example:

Species being considered			***White Oak lumber in a 10/4 size as compared to premium white oak logs***					
Log Grade	**Log price**	**(Note: Price is for the log in United States with no shipping costs - in this example, log price premiums are paid for premium mix of larger diam**						
F1	***$600.00***	**price is in U.S. $/MBF log scale in United States**						
F2	***$450.00***	**price is in U.S. $/MBF log scale in United States**						
F3	***$300.00***	**price is in U.S. $/MBF log scale in United States**						
Board foot yield per MBF log scale estimated for diameter distribution and cutting scenario considered =						***1066***		
From PROYIELD module - the board foot yield per MBF log scale estimated for diameter distribution and cutting scenario considered was =								1066
	This is equivalent to an overrun of		**6.6%**					
					Scribner	**International**		**Expanded**
Estimated cubic feet of logs per MBF log scale =			***130.1***		**Decimal C**	**1/4 rule**	**Doyle**	**Scribner**
From CONVERT module, the estimated cubic feet of logs per MBF log scale was =					**130.1**	**129.1**	**133.9**	**129.3**
Estimated cubic meters of logs per MBF log scale =			***3.68***					
From CONVERT module, the Estimated cubic meters of logs per MBF log scale was =					**3.68**	**3.66**	**3.79**	**3.66**
Estimated board feet of log scale per cubic foot of logs =			**7.7**					
Estimated board feet of log scale per cubic meter of logs =			**271.4**					
Estimated board feet of lumber recovered per cubic foot of logs =				**8.2**				
Estimated board feet of lumber recovered per cubic meter of logs =				**289.3**				

To use this module the user enters only a few key data points on the cells with text in red, they include the log price in grade, and then expected yield in board feet of lumber per MBF (1,000 board feet) of log input, in this case using an estimate of 1,066 board feet that was “coached” from the PROYIELD module. The user enters conversion estimates of cubic feet of logs per MBF and cubic meters per MBF, in this case as “coached” by the Convert module for the log distribution and the appropriate scale. The user also enters information regarding residual weights and values per MBF of log input, in this case as was “coached” from the PROYIELD module (these could be ignored by setting them to essentially a zero value for rough estimates). The only other entry information required is regarding lumber prices and estimates, grade yields for lumber recovery and an appropriate exchange rate for the currency of interest (in this example Indian Rupees).

Example of the entry element and base results in dollars is as follows:

Species being considered		*White Oak lumber in a 10/4 size as compared to premium white oak logs*							
Log Grade	Log price	(Note: Price is for the log in United States with no shipping costs - in this example, log price premiums are paid for premium mix of larger diam							
F1	*$600.00*	price is in U.S. $/MBF log scale in United States							
F2	*$450.00*	price is in U.S. $/MBF log scale in United States							
F3	*$300.00*	price is in U.S. $/MBF log scale in United States							
Board foot yield per MBF log scale estimated for diameter distribution and cutting scenario considered =							*1066*		
From PROYIELD module - the board foot yield per MBF log scale estimated for diameter distribution and cutting scenario considered was =									1066
This is equivalent to an overrun of		6.6%							
						Scribner	International		Expanded
Estimated cubic feet of logs per MBF log scale =		*130.1*				Decimal C	1/4 rule	Doyle	Scribner
From CONVERT module, the estimated cubic feet of logs per MBF log scale was =						130.1	129.1	133.9	129.3
Estimated cubic meters of logs per MBF log scale =		*3.68*							
From CONVERT module, the Estimated cubic meters of logs per MBF log scale was =						3.68	3.66	3.79	3.66
Estimated board feet of log scale per cubic foot of logs =		7.7							
Estimated board feet of log scale per cubic meter of logs =		271.4							
Estimated board feet of lumber recovered per cubic foot of logs =				8.2					
Estimated board feet of lumber recovered per cubic meter of logs =				289.3					
Average bone dry units (2,400 dry pound equivalent) of sawmill residue wood and bark, per MBF of log scale processed =								*0.94*	
From PROYIELD module, average bone dry units of sawmill residue wood and bark, per MBF of log scale processed =								0.94	
Assumed value per bone dry unit for the sawmill wood and bark residue =				*$28.26*					
From PROYIELD module, average value per bone dry unit for the sawmill wood and bark residue =							$28.26		
Equivalent assumed value of the wood and bark residue on a dry per kilogram basis =						$0.0260			
The cost of shipping the lumber should be included within the lumber values for the grades that would be normally shipped (e.g. here #2A and Better).									
This allows analysis as if the low grades of lumber sawn in the United States would be sold in the United States (i.e. where value in low grade does not justify shipment).									
The same (low) value is assigned for the low grade lumber sold in the United States (when not shipped) or if sawn from an imported log from the United States.									
Note: As calculated within the "Container Estimator" module, the shipping cost per MBF of this lumber is approximately =								$289.47	
		Estimated lumber value in grade for analysis of sizes produced - gross tally for dry lumber							
		Sel&Better	#1 Com	#2A	Below #2A				
		$2,750.00	*$1,700.00*	*$1,250.00*	*$250.00*				
							Average Value per MBF of lumber		
							For Lumber Recovered In Log Grade		
		User estimate of likely grade mix for S&B, #1 and #2A					All grades		
	Log Grade	Sel&Better	#1 Com	#2A	Below #2A	Totals	recovered	#2A and Better only	
	F1	*22.0%*	*20.0%*	*15.0%*	43.0%	100.0%	$1,240.00	$1,986.84	
	F2	*8.0%*	*18.0%*	*20.0%*	54.0%	100.0%	$911.00	$1,686.96	
	F3	*2.0%*	*12.0%*	*15.0%*	71.0%	100.0%	$624.00	$1,539.66	
		Estimate of volume of lumber recovered per MBF log				Total board feet recovered per MBF log			
	Log Grade	Sel&Better	#1 Com	#2A	Below #2A	All grades	#2A and Better only		
	F1	234.5	213.2	159.9	458.4	1066	607.6		
	F2	85.3	191.9	213.2	575.6	1066	490.4		
	F3	21.3	127.9	159.9	756.9	1066	309.1		
		Estimate of values of lumber recovered per MBF log				Total value of lumber recovered per MBF log			
	Log Grade	Sel&Better	#1 Com	#2A	Below #2A	All grades	#2A and Better only		
	F1	$644.93	$362.44	$199.88	$114.60	$1,321.84	$1,207.25		
	F2	$234.52	$326.20	$266.50	$143.91	$971.13	$827.22		
	F3	$58.63	$217.46	$199.88	$189.22	$665.18	$475.97		

The next step of this into the export element is as follows:

Note: As calculated within the "Container Estimator" module, the shipping cost per MBF of these logs is approximately =								$706.41	
									Estimated
			Estimated	Estimated	Estimated	Estimated	Estimated	Estimated	Total Net
		Estimated	Purchased	Shipment	Sawing	Drying	net value	net value	Value Lumber
		Lumber Value	log cost (US)	cost	cost	cost lumber	of lumber	of residuals	and residuals
	Log Grade	per MBF Log	per MBF Log	per MBF Log	per MBF Log	per MBF Log	per MBF Log	per MBF Log	per MBF Log
	F1	$1,321.84	$600.00	$706.41	$50.00	$50.00	-$84.57	$26.56	-$58.00
	F2	$971.13	$450.00	$706.41	$50.00	$50.00	-$285.28	$26.56	-$258.71
	F3	$665.18	$300.00	$706.41	$50.00	$50.00	-$441.22	$26.56	-$414.66
Currency exchange rate, $1.00 US dollar =			*55.19*	*Indian Rupees*					
									Estimated
			Estimated	Estimated	Estimated	Estimated	Estimated	Estimated	Total Net
		Estimated	Purchased	Shipment	Sawing	Drying	net value	net value	Value Lumber
		Lumber Value	log cost (US)	cost	cost	cost lumber	of lumber	of residuals	and residuals
		Indian Rupees	Indian Rupees	Indian Rupees	Indian Rupees	Indian Rupees	Indian Rupees	Indian Rupees	Indian Rupees
	Log Grade	per MBF Log	per MBF Log	per MBF Log	per MBF Log	per MBF Log	per MBF Log	per MBF Log	per MBF Log
	F1	72,952	33,114	38,987	2,760	2,760	-4,667	1,466	-3,201
	F2	53,596	24,836	38,987	2,760	2,760	-15,745	1,466	-14,278
	F3	36,712	16,557	38,987	2,760	2,760	-24,351	1,466	-22,885
	From the CONVERT module for the assumed distribution:				Average cubic meters per MBF scale in Scribner Decimal C Log Rule =				3.685
	From the CONVERT module for the assumed distribution:				Average cubic meters per MBF scale in International 1/4 Log Rule =				3.656
	From the CONVERT module for the assumed distribution:				Average cubic meters per MBF scale in Doyle Log Rule =				3.793
	From the CONVERT module for the assumed distribution:				Average cubic meters per MBF scale in Expanded Scribner Log Rule =				3.663
	Assumed cubic meters per MBF log scale is =			*3.685*					
									Estimated
			Estimated	Estimated	Estimated	Estimated	Estimated	Estimated	Total Net
		Estimated	Purchased	Shipment	Sawing	Drying	net value	net value	Value Lumber
		Lumber Value	log cost (US)	cost	cost	cost lumber	of lumber	of residuals	and residuals
		Indian Rupees	Indian Rupees	Indian Rupees	Indian Rupees	Indian Rupees	Indian Rupees	Indian Rupees	Indian Rupees
		per cubic meter	per cubic meter	per cubic meter	per cubic meter	per cubic meter	per cubic meter	per cubic meter	per cubic meter
	Log Grade	of log	of log	of log	of log	of log	of log	of log	of log
	F1	19,797	8,986	10,580	749	749	-1,267	398	-869
	F2	14,544	6,740	10,580	749	749	-4,273	398	-3,875
	F3	9,962	4,493	10,580	749	749	-6,608	398	-6,210