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*Research article*

# Determining a proportion of labor and equipment to achieve optimal production: A model supported by evidence of 19 U.S. industries from 2000 to 2020

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## Supplementary

### Appendix

Two additional regression models are provided. Table A.1 shows the model when the natural logarithm of structures cost is used. Table A.2 shows the difference when structures cost, inventories cost, and land cost are removed to create a conventional model that only factors labor and capital.

**Table A.1.** Regression model using log structures cost.

Variable	<i>b</i>	SE	p-value
Intercept	2.809	0.084	0.000
Log of Labor Cost	0.447	0.018	0.000
Log of Equipment and IPP Cost	0.290	0.017	0.000
Log of Structures Cost	0.091	0.017	0.000
Inventories Cost	−0.001	0.001	0.054
Land Cost	0.009	0.001	0.000

Note:  $n = 399$ . The adjusted R-squared is 0.91. The residual standard error is 0.26 on 393 degrees of freedom. This model applies the natural logarithm of structures cost and highlights a fundamental issue in the way structures are defined as a variable. In comparison to Table 4, increases to the coefficients' standard errors and the residual standard error are observed in this model. While the coefficient of structures cost increases from 0.002 in Table 4 to 0.091 in this model, the standard error of structures cost grows from 0.000 in Table 4 to 0.017 in this model. The p-value of inventories cost rises from 0.028 in Table 4 to 0.054 in this model, reducing statistical significance by one critical level (from  $\alpha = 0.05$  to  $\alpha = 0.1$ ). This model is weaker than the model shown in Table 4. Source: Author's analysis of data from the U.S. Bureau of Labor Statistics and the U.S. Bureau of Economic Analysis.

**Table A.2.** Partial regression model using only two independent variables.

Variable	<i>b</i>	SE	p-value
Intercept	3.142	0.093	0.000
Log of Labor Cost	0.370	0.021	0.000
Log of Equipment and IPP Cost	0.428	0.016	0.000

Note:  $n = 399$ . The adjusted R-squared is 0.85. The residual standard error is 0.33 on 396 degrees of freedom. This model removes structures cost, inventories cost, and land cost, leaving only two independent variables to measure the effects of labor and equipment and IPP on output. The adjusted R-squared decreases and the residual standard error increases. The coefficients' standard errors also increase. The values of the coefficients are switched around, making the coefficient of the natural logarithm of equipment and IPP cost larger than that of the natural logarithm of labor cost. Equipment and IPP cost has a larger effect. This model would produce a completely different outcome in comparison to the outcome in Table 4. Source: Author's analysis of data from the U.S. Bureau of Labor Statistics and the U.S. Bureau of Economic Analysis.



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