Labor cost decomposition

The average labor costs per employee for firm k can be written as the following identity:

$$\frac{\sum_{j=1}^{5} LC_{jk}}{\sum_{j=1}^{5} L_j} = \sum_{j=1}^{5} w_{jk} \frac{L_{jk}}{\sum_{j=1}^{5} L_j}, \quad (1)$$

where j denotes the jth skill level and LC_{jk} the labor costs for skill group j and firm k. The term $\frac{L_{jk}}{\sum_{j=1}^{5} L_j}$ denotes the share of workers of quality j in total employment of firm k. The coefficients w_{jk} are the annual average labor cost of firm k for a worker with skill level j.
It is assumed that the w_{jk} are determined by average labor costs for labor of quality j across all firms, w_j, a set of firm–specific variables collected in row vector $\boldsymbol{K_k}$ and an i.i.d. normally distributed error term, ϵ_k: $w_{jk} = w(j) + \gamma \boldsymbol{K_k} + \epsilon_k$, where gamma relates $\boldsymbol{K_k}$ to w_{jk}. Insertion of the latter expression into (4) leads to the following estimation equation:

$$\frac{\sum_{j=1}^{5} LC_{jk}}{\sum_{j=1}^{5} L_j} = \sum_{j=1}^{5} w_j \frac{L_{jk}}{\sum_{j=1}^{5} L_j} + \boldsymbol{K_k} \frac{L_{jk}}{\sum_{j=1}^{5} L_j}. \quad (2)$$

The estimated labor cost, $\hat{w}_{jk}$, are given by $\hat{w}_{jk} = \hat{w}(j) + \boldsymbol{K_k} \hat{\gamma}$. Table A1 displays estimation results of equation (5). Vector $\boldsymbol{K_k}$ is assumed to be determined by productivity (number of employees over sales), number of employees (in natural logarithm), a set of sector dummy variables (base category: cleaning) and a dummy variable for East German firms. The share of unskilled workers served as the base category. The number of observations is 1.130, the adjusted R^2 is .3232, the root mean squared error is 0.0271. Returns to education (Mincer, 1997) are reflected by larger coefficients of the shares of university graduates, technically skilled and skilled workers. Average labor costs for a natural sciences graduate are 40,062 German marks higher than for an unskilled worker whose labor cost are 28,020 German marks per year on average.

Table A1: OLS estimation results of equation (5)

	Coeff.	Std. err.
$\frac{L_{1k}}{\sum_{j=1}^{5} L_j}$	0.0401	0.0059
$\frac{L_{2k}}{\sum_{j=1}^{5} L_j}$	0.0456	0.0088
$\frac{L_{3k}}{\sum_{j=1}^{5} L_j}$	0.0235	0.0065
$\frac{L_{4k}}{\sum_{j=1}^{5} L_j}$	0.0067	0.0031
Productivity	0.0548	0.0064
East Germany	-0.0162	0.0018
log(# of employees)	0.0026	0.0006
Transport	0.0054	0.0031
Housing	-0.0001	0.0041
Software	0.0100	0.0045
Technical services	0.0086	0.0043
Consultancy	0.0037	0.0032
Other	-0.0023	0.0040
Constant	0.0280	0.0041