

CASE: Analysis of Mixed Costs, Job-Order Costing, and Activity-Based Costing

Ruedi Bärlach PLC, a company located in Gümligen, Switzerland, manufactures custom-designed high-precision industrial tools. The company has a traditional job-order costing system in which direct labor and direct materials costs are assigned directly to jobs, but factory overhead is applied to jobs using a predetermined overhead rate based on direct labour-hours. Management uses this job cost data for valuing cost of goods sold and inventories for external reports. For internal decision-making, management has largely ignored this cost data since direct labor costs are basically fixed and management believes overhead costs actually have little to do with direct labour-hours. Recently, management has become interested in activity-based costing (ABC) as a way of estimating job costs and other costs for decision-making purposes.



Management assembled a cross-functional team to design a prototype ABC system. Electrical costs were among the first factory overhead costs investigated by the team. Electricity is used to provide light, to power equipment, and to heat the building in the winter. The ABC team proposed allocating electrical costs to jobs based on machine-hours since running the machines consumes significant amounts of electricity. Data assembled by the team concerning actual direct labour-hours, machinehours, and electrical costs over a recent eight-week period have been entered into the spreadsheet that appears below. (The Swiss currency is the Swiss franc, which is denoted by SFr.)

	A	B	C	D	E
		<i>Direct Labor- Hours</i>	<i>Machine- Hours</i>	<i>Electrical Costs</i>	
1					
2	Week 1	8,910	7,700	SFr 84,600	
3	Week 2	8,920	8,600	81,800	
4	Week 3	8,870	8,600	81,000	
5	Week 4	8,840	8,500	80,800	
6	Week 5	8,990	7,600	79,400	
7	Week 6	8,940	7,100	82,800	
8	Week 7	8,870	6,000	73,100	
9	Week 8	8,910	6,800	80,800	
10	Total	71,250	60,900	SFr 644,300	
11					

To help assess the effect of the proposed change to machine-hours as the allocation base, the above eight-week totals were converted to annual figures by multiplying them by six.

	Direct Labor- Hours	Machine- Hours	Electrical Costs
Estimated annual total (eight-week total above × 6)	427,500	365,400	SFr 3,865,800

Required:

1. Assume that the estimated annual totals shown above are used to compute the company's predetermined overhead rate. What would be the predetermined overhead rate for electrical costs if the allocation base is direct labour-hours? Machine-hours?
2. Management intends to bid on a job for a set of custom tools for a watchmaker that would require 30 direct labor-hours and 25 machine-hours. How much electrical cost would be charged to this job using the predetermined overhead rate computed in part (1) above if the allocation base is direct labour-hours? machine-hours?
3. Prepare a scattergraph in which you plot direct labour-hours on the horizontal axis and electrical costs on the vertical axis. Prepare another scattergraph in which you plot machine-hours on the horizontal axis and electrical costs on the vertical axis. Do you agree with the ABC team that machine-hours is a better allocation base for electrical costs than direct labour-hours? Why?
4. Using machine-hours as the measure of activity and the least-squares regression method, estimate the fixed and variable components of electrical costs.
5. How much electrical cost do you think would actually be caused by the custom tool job for the toolmaker in part (2) above? Explain.
6. What factors, apart from direct labour-hours and machine-hours, are likely to affect consumption of electrical power in the company?