

Life is messy and deciding how to allocate capital resources is complicated. So, unlike the highly simplified problems used in class (and in the online examples, homework, etc.), this is a more robust capital budgeting decision problem.

Acme Manufacturing, Inc. was originally a family owned operation that has been in business for several generations. It has grown steadily and is now listed on the stock exchange with family members still owning a substantial portion of the shares. Over the years, the company has acquired a reputation for exceptional quality and has won awards from major customers.

The firm is 55% equity financed; shares currently trade at \$37.00 and do not pay a dividend. Debt capital is provided by a single issue of bonds (20 year, \$1,000 par value, \$82.50 annual coupon) currently trading at \$1,175. The firm's beta is 1.25. Their traditional hurdle rate has been 12%, though the rate has not been reviewed in many years. Over the years, shareholders have come to expect a 10% return. Their corporate tax rate is 25%. Treasury securities are yielding 5.25%. The market rate of return on equities is 9.25%.

The Machine Tool Division is considering the purchase of a piece of highly-automated, robotic production equipment. It would replace older machines and would offer improvements in quality, and some additional capacity for expansion. Because of the magnitude of the proposed expenditure, a careful estimate of the projects costs and benefits is needed.

They are currently using several old-style machines that together had cost \$700,000. Depreciation of \$220,000 has already been charged against this total cost; depreciation charges are \$80,000 annually. Management believes these machines will need to be replaced after six more years. They have a current market value of \$250,000.

The old machines require 12 workers per shift earning \$13.50/hr plus 3 maintenance workers paid \$14.50/hr. The plant operates day and afternoon shifts five days each week; maintenance workers are assigned to the afternoon shift only. Maintenance expenses have been running at \$5,000 annually; the cost of electricity has been \$26,600 per year. The production process is not only labor intensive, but also physically demanding. Workplace injuries are not uncommon and lately medical claims have increased.

The new machine will have a total cost that includes shipping, installation and testing of \$1.5 million. The plant will also need \$350,000 in modifications to accommodate the new machine. These costs will be capitalized and depreciated over the six-year estimated life of the machine. The new machine would require only two skilled operators (one per shift) who would earn \$20/hr. Maintenance will be outsourced and cost \$90,000 per year. The annual cost of electricity is estimated to be \$50,000.

Certain aspects of the decision are difficult to quantify. Management's relationship with the union hasn't always been a smooth one and union leadership may not agree to the layoff of the redundant workers. Reassigning