
Fonderia del Piemonte S.p.A.

In November 2015, Martina Bellucci, managing director of Fonderia del Piemonte S.p.A., was considering the purchase of a Thor MM-9 automated molding machine. This machine would prepare the sand molds into which molten iron was poured to obtain iron castings. The Thor MM-9 would replace an older machine and would offer improvements in quality and some additional capacity for expansion. Similar molding-machine proposals had been rejected by the board of directors for economic reasons on three previous occasions, most recently in 2014. This time, given the size of the proposed expenditure of nearly EUR2 million,¹ Bellucci was seeking a careful estimate of the project's costs and benefits and, ultimately, a recommendation of whether to proceed with the investment.

The Company

Fonderia del Piemonte specialized in the production of precision metal castings for use in automotive, aerospace, and construction equipment. The company had acquired a reputation for quality products, particularly for safety parts (i.e., parts whose failure would result in loss of control for the operator). Its products included crankshafts, transmissions, brake calipers, axles, wheels, and various steering-assembly parts. Customers were original-equipment manufacturers (OEMs), mainly in Europe. OEMs were becoming increasingly insistent about product quality, and Fonderia del Piemonte's response had reduced the rejection rate of its castings by the OEMs to 70 parts per million.

This record had won the company coveted quality awards from BMW, Ferrari, and Peugeot, and had resulted in strategic alliances with those firms: Fonderia del Piemonte and the OEMs exchanged technical personnel and design tasks; in addition, the OEMs shared confidential market-demand information with Fonderia del Piemonte, which increased the precision of the latter's production scheduling. In certain instances, the OEMs had provided cheap loans to Fonderia del Piemonte to support capital expansion. Finally, the company received relatively long-term supply contracts from the OEMs and had a preferential position for bidding on new contracts.

Fonderia del Piemonte, located in Turin, Italy, had been founded in 1912 by Bellucci's great-great-grandfather Benito Bellucci, a naval engineer, to produce castings for the armaments industry. In the 1920s and 1930s, the company expanded its customer base into the automotive industry. Although the company barely avoided financial collapse in the late 1940s, Benito Bellucci predicted a postwar demand for precision metal casting and positioned the company to meet it. From that time, Fonderia del Piemonte grew slowly but steadily; its sales for calendar-year 2015 were expected to be EUR1.3 billion. It was listed for trading on the Milan stock

¹ EUR= euros; USD = U.S. dollars.

exchange in 1991, but the Bellucci family owned 55% of the common shares of stock outstanding. The company's beta was estimated at 1.25.²

The company's traditional hurdle rate of return on capital deployed was 7%, although this rate had not been reviewed since 2012. In addition, company policy sought payback of an entire investment within five years. At the time of the case, the market value of the company's capital was 33% debt and 67% equity. The prevailing borrowing rate Fonderia del Piemonte faced on its loans was 2.6%. The company's effective tax rate was about 43%, which reflected the combination of national and local corporate income-tax rates.

Bellucci, age 57, had assumed executive responsibility for the company 15 years earlier, upon the death of her father. She held a doctorate in metallurgy and was the matriarch of an extended family. Only a son and a niece worked at Fonderia del Piemonte, however. Over the years, the Bellucci family had sought to earn a rate of return on its equity investment of 12%—this goal had been established by Benito Bellucci and had never once been questioned by management.

The Thor MM-9 Machine

Sand molds used to make castings were prepared in a semiautomated process at Fonderia del Piemonte. Workers stamped impressions in a mixture of sand and adhesive under heat and high pressure. The process was relatively labor intensive, required training and retraining to obtain consistency in mold quality, and demanded some heavy lifting from workers. Indeed, medical claims for back injuries in the molding shop had doubled since 2012 as the mix of Fonderia del Piemonte's casting products shifted toward heavy items. Items averaged 25 kg in 2015.

The new molding machine would replace six semiautomated stamping machines that together had originally cost EUR423,000. Cumulative depreciation of EUR169,200 had already been charged against the original cost and six years of depreciation charges remained over the total useful life of 10 years. Fonderia del Piemonte's management believed that those semiautomated machines would need to be replaced after six years. Bellucci had recently received an offer of EUR130,000 for the six machines.

The current six machines required 12 workers per shift³ (24 in total) at EUR14.66 per worker per hour, plus the equivalent of two maintenance workers, each of whom was paid EUR15.70 an hour, plus maintenance supplies of EUR6,000 a year. Bellucci assumed that the semiautomated machines, if kept, would continue to consume electrical power at the rate of EUR15,300 a year.

The Thor MM-9 molding machine was produced by an American company in Allentown, Pennsylvania. Fonderia del Piemonte had received a firm offering price of USD1.9 million from the American firm. Since the prevailing exchange rate between the euro and the U.S. dollar was 1.06 USD per euro, the price in euros was EUR1.8 million. The estimate for modifications to the plant, including wiring for the machine's power supply, was EUR100,000. Allowing for EUR50,000 for shipping, installation, and testing, the total cost of the Thor MM-9 machine was expected to be EUR1.95 million, all of which would be capitalized and depreciated for tax purposes over eight years. Bellucci assumed that, at a high and steady rate of machine utilization, the Thor MM-9 would be worthless after the eighth year and need to be replaced.

The new machine would require two skilled operators (one per shift), each receiving EUR22.72 an hour (including benefits), and contract maintenance of EUR120,000 a year, and would incur power costs of

² The current yield on euro-denominated bonds issued by the Italian governments was 1.7%. Bellucci assumed that the equity risk premium would be 5%. Also, she believed that current bond yields in Europe effectively impounded an expectation of no inflation over the next 10 years.

³ The foundry operated two shifts a day. It did not operate on weekends or holidays. At maximum, the foundry would produce for 210 days a year.

EUR40,000 yearly. In addition, the automatic machine was expected to save at least EUR30,000 yearly through improved labor efficiency in other areas of the foundry.

With the existing machines, more than 30% of the foundry's floor space was needed for the wide galleries the machines required; raw materials and in-process inventories had to be staged near each machine in order to smooth the workflow. With the automated machine, almost half of that space would be freed for other purposes—although at that point there was no need for new space.

Certain aspects of the Thor MM-9 purchase decision were difficult to quantify. First, Bellucci was unsure whether the tough collective-bargaining agreement her company had with the employees' union would allow her to lay off the 24 operators of the semiautomated machines. Reassigning the workers to other jobs might be easier, but the only positions needing to be filled were unskilled jobs, which paid EUR9.13 an hour. The extent of any labor savings would depend on negotiations with the union. Second, Bellucci believed that the Thor MM-9 would result in even higher levels of product quality and lower scrap rates than the company was now boasting. In light of the ever-increasing competition, this outcome might prove to be of enormous, but as yet unquantifiable, competitive importance. Finally, the Thor MM-9 had a theoretical maximum capacity that was 30% higher than that of the six semiautomated machines; but those machines were operating at only 90% of capacity, and Bellucci was unsure when added capacity would be needed. There was plenty of uncertainty about the economic outlook in Europe, and the latest economic news suggested that the economies of Europe might be headed for a slowdown.