CASE 35

Merton Electronics Corporation

Patricia Merton, president and majority shareholder of Merton Electronics, was dissatisfied with her company's results over the past year (see **Exhibits 1** and **2**). Sales had risen by over 12 percent compared to the previous year, very close to budget, but at a considerably slower pace than what had been enjoyed during the previous three years. At the same time, 1997 earnings fell by more than 40 percent reflecting increasingly difficult market conditions. Margins had been flat or falling for the past three years, but 1997 was the worst. Operational improvements had been maintained, keeping working capital and cash needs under control. Also, she had secured additional long-term financing and an increase in the company's credit line. Although continued growth would require additional investment in new computer and office equipment, and other fixed assets, she expected this could be largely financed out of cash flow—if margins did not deteriorate further and working capital could be kept in line with sales.

Since its founding in 1950 by Thomas Merton, Merton Electronics had been a distributor for GEC, a large manufacturer of electrical and electronics products for consumer and institutional markets. Over the years, in addition to the GEC products, the company had added noncompeting lines of electrical appliances, records, compact discs, and cassettes. In 1980, it began to broaden its product lines by importing Japanese consumer electronics. Four years later, it entered into an exclusive import agreement with the Goldstone Corporation of Taiwan, a major producer of television and other electronic equipment. These products were distributed to retail firms and dealers throughout a broad geographical area.

By the beginning of the 1990s, the company had entered into the personal computer (PC) market distributing both hardware and software products. It became the national distributor for Fuji Electronics, a major Japanese manufacturer of PCs and related products, in September 1993. This had proven to be a fast growing market, accounting for more than half of total sales although only about a third of profits in 1997; this part of the business was becoming more and more competitive as price-cutting had become rampant from mail order and computer discount houses.

Patricia Merton had been working in the company for two years when her father, Thomas Merton, died in the spring of 1991. As the only family member with experience

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in the company, she succeeded him as president. Together with her mother, she controlled 65 percent of the share capital of the firm. The remaining shares were held by her father's brother and sister, their families, and a few long-service employees.

During the first weeks of 1998, she had been taking advantage of the relative calm that usually marked that time of the year. This was when they took the semi-annual inventory, tended to various small problems that had been pushed aside during the past few months, and thought about the future.

One of the things that continued to disturb her was the volatility of the yen, and more recently, the Taiwanese dollar (see **Exhibit 3**). Over half of the equipment sold in the PC, TV and VCR, and Hi-fi product lines were imported from Japanese suppliers. From a volume of about $20 million two years earlier, yen-denominated purchases had approached $27 million during the past 12 months. Annual purchases totaling another $4 million were from Taiwanese suppliers. With the volume expected in the consumer electronics and PC product lines, she foresaw purchases from Fuji Electronics, the company's principal supplier, and other Asian manufacturers to increase in the future.

Typical of Merton's Japanese suppliers, Fuji Electronics had always insisted on invoicing in yen. In contrast, at the beginning of their agreement, Goldstone Corporation had invoiced in U.S. dollars. This changed in 1989, when the company was informed that from then on, the Taiwan dollar would be used for billing.

Once an order was placed, the Asian suppliers shipped by airfreight normally within 60 days. Payment terms were 30 days from the end of the delivery month; hence the ¥284 million value of goods delivered in January 1998 would be paid at the end of February (see **Exhibit 4**). With few exceptions, the spot price on the last day of the month in which the order was placed was used for the invoice. This meant that Merton had on average a 90-day currency exposure for each order.

Two years earlier, towards the end of January 1996, concerned that the falling margins were at least partially due to the impact of a rising exchange rate, Patricia Merton had asked her general manager, Charles Brown, to gather some data on the monthly volume of purchases from Japanese suppliers as well as the yen–dollar exchange rates. The data gathered by Brown at the time astonished her. The effect of the yen's more or less continual appreciation against the dollar until the summer of 1995 meant that purchases during that period appeared to have cost the company significantly more—in dollar terms—than if the exchange rate had been stable. Fortunately, thanks to the popularity of the Fuji products, they had been able until 1995 to increase prices to partially offset their higher dollar costs. Also, the Japanese suppliers had absorbed some of the yen's rise by cutting prices significantly. But as the dollar fell through the ¥100 "barrier," it became more and more difficult to maintain margins. During the first four months of 1995, the rising yen translated into almost $1.1 million higher dollar cost of purchases. Although Brown did not prepare a detailed analysis of purchases before 1995, he estimated that "losses" were if anything considerably larger. On the other hand, his data had shown that between July and December 1995, a strengthening dollar produced "gains" of over $1.4 million. As a result of this analysis, they had sought the advice of their banker in January 1996.

Listening to his clients' story, the banker agreed that Merton did face significant currency risk. Further, he reminded them that since Merton Electronics imported a higher portion of its products from Japan than some of its principal competitors, its profit margins were much more sensitive to the value of the yen than theirs were. In view of this, he advised them to hedge their yen purchases. The bank would arrange hedges to cover the orders placed during the month. They agreed that this would be on a monthly basis to obtain the better rates relatively large transactions would provide. The hedges would, he explained, fix in advance the dollar cost of each month's orders. This would effectively remove the currency problem from their everyday concerns and allow them to concentrate on running the business. As for purchases from the Taiwanese suppliers, the banker told them the Taiwanese authorities managed their currency so that it stayed more or less fixed to the U.S. dollar, that even if it were to move it was likely to depreciate, and for these reasons, hedging would not be worthwhile. This advice was taken and since 1996, Merton had systematically hedged each yen purchase order; purchases from Taiwanese suppliers were not hedged.

Now, after two years, Patricia Merton thought it was time to review this policy. Once again she asked Brown to look at their experience over the past year, going back to January 1997. What this showed was completely different from the previous analysis. Although the yen was still volatile, it had mainly weakened against the dollar during this period. By hedging, the dollar cost of yen purchases had been about $25.5 million during 1997. If the purchases had not been hedged, but the yen bought on the spot market when the invoices came due, the dollar cost would have been about $24.6 million—almost $900,000 difference! This was almost exactly the pre-tax earnings for 1997. Extremely disturbed by what Brown told her, Patricia Merton immediately contacted the firm's banker and arranged to see him later in the day.

Merton's meeting with her banker was strained at the beginning. Somewhat defensive, he maintained that since neither he, nor anyone else for that matter, could have accurately predicted how the yen–dollar exchange rate would have moved during the past two years, hedging the exposures was the most prudent policy for Merton. Furthermore, with so much economic and political uncertainty in Japan and the rest of Asia at the present time, he could not recommend in good conscience a better solution to managing the yen risk. When Patricia Merton asked him why he had not encouraged them earlier to hedge the Taiwanese dollar payments, he recalled his advice at the time was that it had been basically pegged to the U.S. dollar for several years and anyway was difficult to hedge satisfactorily because of exchange controls imposed by the Taiwanese authorities. He reckoned that by following his recommendation not to hedge the Taiwanese dollar purchases, the U.S. dollar costs had been lower in 1997 by some $125,000 compared to what they would have been if hedged. Not entirely satisfied by his explanation, she asked him what he thought they should do now.

The issue boiled down to whether the company should take on currency risk or not, and if so, how much. With over 60 percent of its purchases subject to currency fluctuations, the banker stuck to his earlier view that the firm could not afford to ignore this risk. He admitted that, with hindsight, not hedging would have been the best policy over the past one to two years. This meant that Merton would have bought the foreign currency on the spot market each time payments to the Asian suppliers were

made. This, he said, was essentially a bet on a stronger dollar—which turned out to be the case. Quickly checking the numbers, he noted that if the ¥880 million worth of goods on order or already invoiced at the end of January were to be settled at the current spot rate of ¥127, this would cost Merton about $6.93 million. As it stood, the company was already committed to pay $7.04 million since these purchases had been hedged when the goods were ordered. In other words, hedging appeared to have cost them some $110,000 at the present time. This lost opportunity would be larger or smaller depending on what the yen would do between now and when the invoices were settled. Nevertheless, he still would not advise the company to "do nothing" and expose itself to large possible currency losses in the future. Patricia Merton, as president and major shareholder of the company, would have to decide.

Accepting his arguments that it would be unwise to "do nothing," she thought it would be useful to review the various other alternative courses that the company might follow. Although the company had been using forward contracts for some 18 months to hedge the yen purchases, Merton felt she needed to have her memory refreshed, and asked the banker to outline once again how the different hedges worked.

According to the banker, there were two basic choices when hedging. It could "lock in" today an exchange rate that would be close to the current spot rate; the forward contracts they had been using provided this type of hedge. Or they could enter into an option contract that would set an upper bound on the cost of yen, but allow them to take advantage of cheaper yen if that should happen by the time the invoices had to be paid. The option would provide some of the advantages of not hedging, but limit the disadvantages—but at a cost.

To lock in an exchange rate, the banker went on, meant that the future price of a foreign currency—the future spot rate—would in effect be set today—in other words, the hedge was a bet on a stronger yen. This type of hedge insured that whatever the future spot rate might turn out to be, the effective price paid for yen would still be that which was agreed today. There were three ways to lock in an exchange rate: a forward contract, a money market transaction, and a currency futures contract. Each of these carried precisely defined terms with regard to price, maturity, and certain other performance measures. Any modifications in the terms of the contract, such as changing its maturity, would have to be negotiated and agreed with the party providing the hedge, possibly resulting in additional cost.

The forward contract hedge, which the company had used for the past 18 months, was an arrangement by which it bought from the bank a specified quantity of yen to be delivered at a specified date in the future—normally when the invoice had to be settled. The exchange rate was fixed at the outset. At ¥125.50, the 90-day forward rate was at present nearly 1.5 percent more "expensive" than the spot rate. With this hedge, Merton would receive yen from the bank on the agreed maturity date, pay the bank the amount of dollars at the forward exchange rate set earlier (¥125.50), and then use the yen to pay the Japanese suppliers.

The money market hedge was also an arrangement with the bank. Merton would buy yen today on the spot market and place it in a yen time deposit or some other yen asset until needed to pay the suppliers. The purchase of yen would be financed in dollars by a short-term loan or by using cash reserves if they were available.

The cost of this hedge would be the difference between the interest paid on the dollar loan and that received from the yen deposit. The banker reminded them that Merton could borrow dollars at 25 basis points[1] over the current prime rate (8.50 percent); but they would only earn at present ⅛ percent on a 3-month Euroyen time deposit, Japanese rates being at an all-time low (see **Exhibit 5** for rates).

The yen futures hedge was provided by an instrument traded on the Chicago Mercantile Exchange (CME).[2] Quotations for yen futures on January 22 appear in **Exhibit 6**. As protection against loss from currency fluctuations, this hedge was very similar to the forward contract provided by the bank. Merton would buy a sufficient number of futures to create the hedge. It could then wait until the futures contracts came to maturity and take delivery of the yen. Alternatively, if Merton decided the hedge was no longer needed before the futures contracts reached maturity, they could be sold. If a rise in the value of the yen meant it cost more dollars to settle the purchase account with the Japanese suppliers, it also meant that the futures would be sold at a profit, thereby providing an offset. However, the mechanics of futures contracts differ considerably from forwards. The contracts are made through a member of the futures exchange, usually a broker. Currency futures come in standard contract sizes (for the yen ¥12.5 million), and standard maturity dates (the third Wednesday of March, June, September, December). They are revalued daily (marked-to-market) with any profit or loss immediately settled between broker and client. To trade on the futures market, the client must open and maintain collateral (a margin account) with the broker. This changes from time to time, but at present, is a minimum of $1,500 per contract. In addition, the broker will charge a small commission.

The currency option contract was available from either banks or exchanges. Option contracts give the right but not the obligation to buy (a call) or to sell (a put) currency or some other asset within a specified period and at a predetermined price known as the strike or exercise price.

Bank or OTC[3] options can be tailored to meet the client's precise needs for maturity, amount, or currency. They are usually European-type options, that is, they may only be exercised at expiration. Most bank options are on spot currency. Merton's banker pointed out that besides dealing in "plain vanilla" (standard) call and put options, he could also offer them synthetic or exotic instruments. Synthetics were combinations of calls, puts, and sometimes forward contracts which were designed to meet particular risk/return objectives of a client. A so-called zero-cost option is one of the more widely used of these. Exotics were options that had some particular feature that gave the buyer a lower premium at the price of a more risky payoff.[4]

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[1]A basis point is 1/100 of a percent, i.e., 0.0001. Basis points are generally used in pricing loans and certain other financial instruments. Rates are usually quoted on an annual basis.

[2]Currency futures are also traded on exchanges in London (LIFFE), Singapore (SIMEX), Sidney, and elsewhere in the world.

[3]OTC: over-the-counter.

[4]Among the most popular were average-rate and barrier or knockout options.

Like futures, exchange-traded options have standardized maturities and amounts. The expiration dates are similar to those for futures: March, June, September, and December. In addition, the American exchanges offer some "nearby" expiration dates (see **Exhibit 7**). For example, at the end of January, contracts were offered for February and April expiration as well as for the March and June standard months. Only a few major currencies are available. Most are priced in U.S. dollars, even those traded on European or Asian exchanges. They are usually so-called American-type options, in other words, they may be exercised at any time before expiration. Recently European-style options have been introduced on some exchanges—they can only be exercised at maturity. Those traded on the Philadelphia exchange are on spot currency. Chicago's CME and London's LIFFE contracts are on currency futures. To buy an option on an exchange, the full premium[5] must be paid in advance. To sell (or write) an option requires a specified margin to be maintained with the broker.

Besides going over the hedging instruments, the banker raised a number of other issues for Merton to consider. The company imported goods from its Japanese suppliers on a continuous basis throughout the year. If they did decide to continue hedging these purchases, should it be when the orders were placed as they have been doing up to now? Or should they wait until the time when the purchase invoice was actually received? What about hedging periodically for a longer period of 6 to 12 months once operating plans and budgets were agreed? Finally if they do continue to hedge, should it be for the entire amount at risk, however it was measured, or only some portion of it?

Merton's banker concluded by stressing there was no "correct" hedging approach. It depended on the particular needs and financial position of the company, and the attitudes of its management and shareholders towards risk. Whether or not the hedge was profitable would only be known ex post—when the supplier was paid. In the case of Merton Electronics, hedging yen during the past months turned out to be the wrong decision; in contrast, it was the correct decision for the Taiwanese dollar. If instead yen had strengthened against the dollar, locking in the rate would have been the correct decision. Further, he cautioned that hedging, under some competitive situations, could actually increase risk rather than decrease it.

The discussion left Merton nearly as baffled as when she arrived at the bank. On leaving, she told the banker that she needed a few days to decide what to do. Back at the office, Merton told Brown that she was pretty much convinced that they should begin to devote a bit more time and thought to managing their currency position. Although they had "lost" some $900,000 on yen purchases during the past few months from a rather simplistic "hedge everything" policy, there was clearly too much uncertainty for a "do-nothing" policy to be justified. The problem was to decide quickly what to do.

Anxious to resolve this matter quickly, Patricia Merton asked Brown to prepare a brief report on how their company's currency risk should be managed. In particular,

[5]The LIFFE exchange uses a margin system similar to that for futures trading. Hence, a specified minimum margin is maintained with the broker rather than paying a cash premium up-front.

she asked him to set out the relative advantages in terms of cost and risk for each of the alternatives that had been described to them by the banker. To provide a practical example, he could use the ¥300 million exposure arising from the goods that were ordered in January and which would be due for payment in April, 90 days from then. She suggested he use the January 22 market rates which they had picked up at the bank (see **Exhibit 5**) and, for the purpose of the analysis, assume that the suppliers would be paid and the hedges lifted on April 22. She also asked him to check out whether they would have been better off hedging with options over the past months than with forwards. She herself intended to give some thought to broader policy issues including whether they should hedge at all and, if so, how much, when, and under what circumstances?

EXHIBIT 1 | Comparative Income Statements (dollars in thousands)

	Year Ending 31 December 1996	Year Ending 31 December 1997
Sales revenue	$53,682	$60,392
Cost of goods sold	44,336	51,228
Gross margin	9,346	9,164
Variable expenses	3,277	3,687
Fixed expenses	3,652	4,009
Depreciation	171	207
Operating earnings (EBIT)	2,246	1,261
Interest expense	565	348
Earnings before taxes	1,681	913
Corporate taxes	581	301
Earnings after taxes	$ 1,100	$ 612

EXHIBIT 2 | Comparative Balance Sheets (dollars in thousands)

	31 December 1996	31 December 1997
Assets		
Current assets:		
Cash & deposits	$ 95	$ 115
Prepaid expenses	96	70
Accounts receivable	7,816	8,794
Inventories	8,880	9,350
	16,887	18,329
Fixed assets (net)	1,290	1,585
Goodwill	150	150
Total assets	$18,327	$20,064
Capital & Liabilities		
Current liabilities:		
Bank credit	$ 4,257	$ 2,237
Mortgage—current	150	150
Accrued expenses	392	359
Accounts payable:		
Domestic	2,215	2,497
Foreign (yen)	3,312	3,670[1]
	10,826	8,913
Mortgage loan	750	600
Subordinated loan	—	500
Capital stock	1,500	1,500
Retained earnings	5,751	6,313
Owners' equity	7,251	7,813
Total capital & liabilities	$18,327	$20,064

[1] *Dollar value of foreign currency accounts payable (¥375.2 million at spot rate of ¥130.5/US$; Taiwan $ 25.9 million at spot rate of TWD 32.6/USD$).*

EXHIBIT 5 | Currency and Other Financial Market Data, January 22, 1998

Spot yen:	127.35–127.40 per $; $0.7849–$0.7852 per ¥100
90-day forward yen:	125.50–125.75 per $; $0.7952–$0.7968 per ¥100
90-day Euroyen interest rates:	3/8%–1/2% per annum
Japanese 10-year government bond yield:	1 3/4%
90-day Eurodollar interest rates:	5 1/2 %–5 5/8 % per annum
Merton short-term borrowing rate:	Prime (8 1/2%) + 25 basis points
March 98 yen futures (CME):	$0.7928; June 1998 yen futures (CME): $0.8031
90-day yen call options (OTC):	$0.7852 strike–$0.0249 per 100 yen $0.7968 strike–$0.0188 per 100 yen

Short-Term Interest Rates

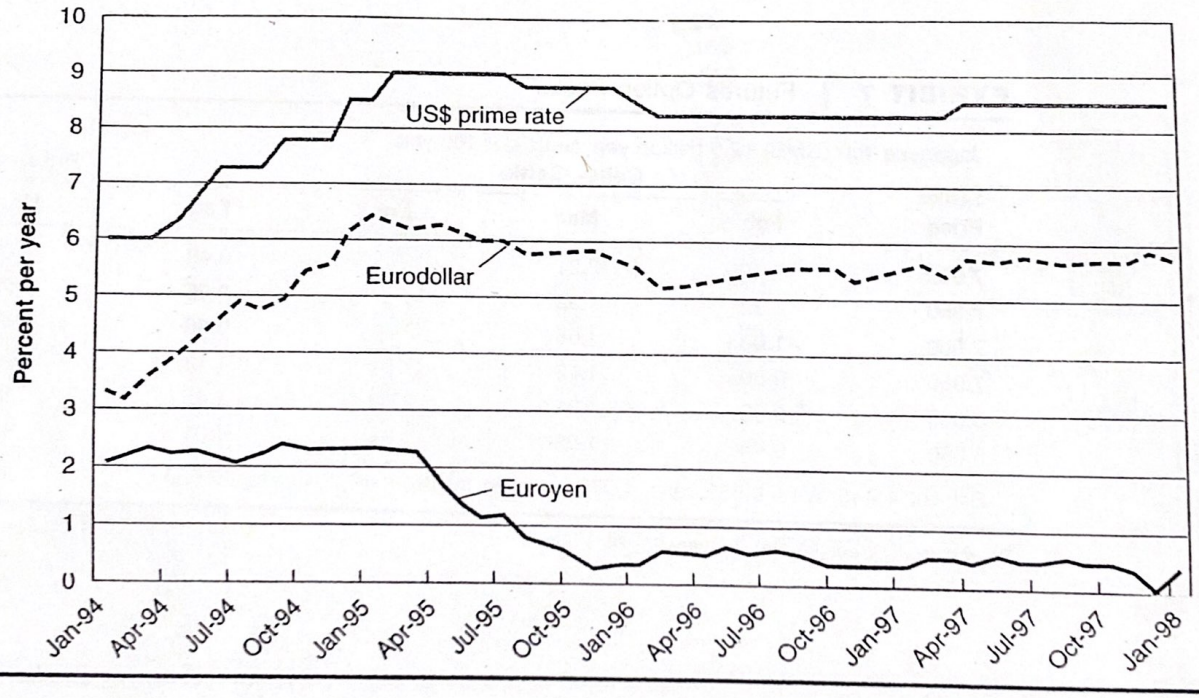

EXHIBIT 6 | Futures Prices

Japan Yen (CME)–12.5 million yen; $ per yen (.00)

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Mar	.7928	.7970	.7890	.7917	−.0024	.9375	.7512	88,937
Jun	.8046	.8046	.7950	.8017	−.0024	.9090	.7637	2,293
Sept	—	—	—	.8117	−.0024	.8695	.7735	413

Est. vol. 20,416; Vol. Th. 36,578; open int. 91,647, +608.

Source: *Wall Street Journal*, January 23–24, 1998.

EXHIBIT 7 | Futures Option Prices

Japanese Yen (CME) 12.5 million yen; cents per 100 yen

Strike Price	Calls—Settle Feb	Calls—Settle Mar	Calls—Settle Apr	Puts—Settle Feb	Puts—Settle Mar	Puts—Settle Apr
7,800	1.66	2.21		0.49	1.05	1.12
7,850	1.32	1.92		0.65	1.25	1.30
7,900	1.03	1.65		0.86	1.48	
7,950	0.80	1.42		1.12	—	—
8,000	0.62	1.21	2.08	1.45	2.02	
8,050	0.48	1.03	1.84	1.81	—	—

Est. vol. 4,445; Wed. 6,552 calls, 4,970 puts; Op. int. Wed. 49,854 calls, 65,330 puts.

Source: *Wall Street Journal*, January 23–24, 1998.