CASE 20

Aurora Textile Company

In January 2003, Michael Pogonowski, the chief financial officer of Aurora Textile Company, was questioning whether the company should install a new ring-spinning machine, the Zinser[1] 351, in the Hunter production facility. A primary advantage of the new ring spinner was its ability to produce a finer-quality yarn that would be used for higher-quality and higher-margin products. The finer-quality yarn would be sold in a niche market that would command a 10% increase in the selling price of yarn, which was currently $1.0235 a pound. In addition, the Zinser would provide increased efficiency as well as greater reliability, which Aurora's operations management had been requesting for many years. The Zinser's efficiency would reduce operating costs, with lower power consumption and maintenance expenses. Sales volume, however, would be 5% lower than the current market, and the cost of customer returns would be higher, which, when combined with the $8.25 million installed cost, made the Zinser decision a difficult one.

Pogonowski believed that the decision to invest in the new technology was complicated by Aurora's lackluster financial performance as well as the difficult circumstances facing the U.S. textile industry. Aurora, however, was competing in a few select markets that were likely to continue to survive foreign competition, albeit at lower margins over the long run. He also recognized that there was unlikely to be a better time to upgrade to the Zinser as its price had been increasing 5% annually. Not every member of the management team, however, agreed with Pogonowski's logic. Some managers were arguing that it would be cheaper to continue with the current maintenance schedule, which should keep the current spinning machine running reliably and allow Aurora to postpone replacement indefinitely.

[1]The Zinser compact spinning technology was marketed under the trademark CompACT3.

The Company

Aurora Textile Company was a yarn manufacturer established in the early 1900s to service both the domestic and the international textile industry. Aurora's finished products were cotton and synthetic/cotton blend yarns that were sold to a variety of apparel and industrial-goods manufacturers that sold their products mainly in U.S. retail markets. Aurora serviced four major customer segments: hosiery, knitted outerwear, wovens, and industrial and specialty products. Although each of these markets had both domestic and international components, 90% of the company's revenue came from the domestic textile market.

Yarn sales for the hosiery market accounted for 43% of Aurora's revenue. The primary consumer products were athletic and dress socks, with white athletic socks accounting for the majority of sales. In fact, Aurora was the largest volume producer of all cotton yarns for white athletic socks in the United States, with nearly half the U.S. population owning socks made with Aurora yarns. Aurora had long enjoyed supplying the hosiery market for several reasons. First, as a leader in the market, Aurora was able to command attractive margins and maintain relationships with some of the largest and most profitable hosiery companies in the world. Second, hosiery was produced using bulky, heavy yarns. Aurora's plants were designed for this type of manufacturing operation, which allowed the company to process large quantities of yarn efficiently. Third, unlike other segments of the textile industry, the hosiery market had successfully defended itself against global competition. The heavy yarns and bulky products were costly to transport, making them less attractive for foreign producers. Moreover, this type of production was highly automated in the United States such that labor costs had been reduced to the point that Asian manufacturers did not have sufficient opportunity to provide significant cost savings over U.S. manufacturers.

The knitted-outerwear market was the second-largest revenue source for Aurora, accounting for 35% of sales. Aurora's customers within this market mainly produced knitted cotton and polyester/cotton dress shirts for a variety of major retailers. The yarns produced were medium- to fine-count yarns (14/1 to 22/1 ring and rotor).[2] This quality yarn, however, was easily produced by other market participants, leaving very little opportunity for suppliers to differentiate their products and creating an environment where there was constant price pressure on outerwear yarns.

Accounting for 13% of Aurora's business revenue, the wovens market was a relatively small but important segment for the company. Most of these yarns were used to produce denim for jeans. Although much of the production had shifted offshore to lower-cost producers, most weavers continued to purchase U.S. yarns in order to avoid the supply risks associated with sourcing yarns from other countries. In addition, the yarns produced for the wovens market were coarse (5/1 to 14/1 ring and rotor) and

[2]The coarseness of a yarn was measured by the amount of yarn it took to equal one pound: the more yarns per pound, the finer the yarn. One "hank" held 840 yards of yarn. A count of 22/1 specified that 22 hanks were needed to equal one pound. A count of 14/1 indicated a coarser yarn than a count of 22/1 in that one pound of 14/1 yarn required only 14 × 840 yards.

were cost efficient to produce in Aurora's manufacturing facilities. Aurora management believed that the company had an excellent opportunity for growth in this market.

Industrial and specialty products constituted the remaining 9% of Aurora's revenue. These yarns were used to produce medical supplies, industrial adhesives, rubber- and vinyl-coated fabrics, and protective clothing. Because the yarn component of many of these products was very small, it was not a high-volume business. Nevertheless, this segment provided the highest margins for Aurora, which made it an attractive opportunity for growth.

Aurora used rotor- and ring-spinning production processes, although rotor spinning, which was also called "open-end" spinning, had constituted the majority of the company's total revenue for many years. (**Exhibits 1** and **2** present Aurora's financial statements for 1999 through 2002.) The steady decline in sales had led to management's decision to close four manufacturing facilities in 2000 in an effort to rightsize Aurora's capacity to the shrinking textile market and reduce manufacturing costs. In January 2003, the company had four plants operating: Hunter, Rome, Barton, and Butler (see **Exhibit 3** for product mix, capacity, and process technology by plant).

The Textile-Mill Industry

The U.S. textile-mill industry had experienced dramatic changes over the years because of globalization, U.S. government trade policies, cheaper production costs overseas, and customer preferences and fads. The industry, which had started in New England, moved to the southern United States to take advantage of cheaper production costs. In more recent years, the search for cheaper production costs had begun to move the textile-mill industry to Asia. As more apparel makers moved their production abroad, the yarn makers followed suit. Thus, U.S. yarn manufacturers were declining in number while facing tougher and tougher competition from the influx of imported yarns. At the same time, the strong U.S. dollar had made it more appealing for some foreign textile manufacturers to export aggressively, flooding the U.S. market. Companies like Aurora, which had kept their manufacturing base exclusively in the United States, were frequently forced to cut costs and modernize their operations to remain competitive.

Consumer preferences and fads also shaped the market. The emphasis in the industry had shifted from mass production to flexible manufacturing as textile mills aimed to supply customized markets. Firms were concentrating on manufacturing systems that allowed small quantities of customized goods to be produced with minimal lead time. This change enabled apparel producers to bring goods to retailers and consumers in a significantly shorter time frame. Information technology allowed retailers to assess their merchandise needs rapidly and to communicate those needs through apparel manufacturers to textile firms. In general, consumer preferences had moved toward finer-quality yarn with minimum defects, and those preferences were even stronger in the high-end market.

Information technology also had a downside for yarn producers like Aurora because of the liability associated with customer returns. For example, a dress shirt that was sold at JCPenney for $25 might include $5 of Aurora yarn. If the yarn was

defective and the defect could be traced back to Aurora, the company would be required to reimburse JCPenney for the full retail price of $25, five times the amount of revenue received by Aurora for the garment. In 2002, 1.5% of the Hunter plant's sales volume had been returned by its retailers. The percentage of volume returned had risen over the past few years owing to advancements in technology and information flow through the supply chain that made it easier to identify the yarn manufacturer associated with a particular garment. If Aurora began selling yarns for use in the high-end market, the company's dollar liability per garment would increase. For example, if Aurora supplied the yarn for a shirt that sold for $75 at Nordstrom, a customer return would make Aurora liable for paying $75 to Nordstrom despite the fact that Aurora would have received only $10 for the yarn used to make the shirt. Aurora's production engineers were confident that the Zinser would yield such high-quality yarn that the volume returned would drop to 1.0%.

The U.S. government's free-trade policies were implemented through the North American Free Trade Agreement (NAFTA) and the Caribbean Basin Initiative (CBI). These trade agreements had created a burden on the U.S. textile industry by encouraging trade with Canada, Mexico, and Caribbean countries, which lowered the prices of consumer goods in the U.S. market. This enriched trade also forced U.S. textile companies to compete against cheaper labor, lower environmental standards, and government-subsidized operations. The net effect was substantially lower-priced goods for U.S. consumers but a very difficult competitive environment for U.S.-based manufacturers.

For other parts of the world, the U.S. State Department had used textile quotas and tariffs as a political bargaining tool to obtain cooperation from foreign governments. The United States and other countries also used quotas and tariffs as a mechanism to prevent the dumping of foreign goods into local markets and to protect the domestic industry. Recently, however, the World Trade Organization (WTO)[3] had announced that, as the governing body for international trade, it would ban its members from using quotas, effective January 1, 2005. This move would further open the U.S. market to competition from countries beyond its immediate borders. Notwithstanding this outlook, most research analysts believed that the U.S. textile industry would grow around 2% in real terms, with prices and costs increasing at a 1% inflation rate for the foreseeable future.

Production Technology

The production of yarn involved the processes of cleaning and blending, carding, combining the slivers, spinning, and winding (**Exhibit 4**). Aurora used only rotor spinning and ring spinning in its yarn production. Ring spinning was a process of inserting twists by means of a rotating spindle. In ring spinning, twisting the yarn and winding it on a bobbin occurred simultaneously and continuously. Although ring spinning was more

[3]Established through agreements and negotiations signed by the bulk of the members of the General Agreement on Tariffs and Trade (GATT), the WTO replaced GATT in January 1995. The WTO was an international, multilateral organization that laid down rules for global trading systems and resolved disputes between member states. Of its 148 members, 76 were founding members, including the United States.

expensive than open spinning because of the former's slower speed, the yarn quality from ring spinning was better. The additional processes (roving and winding) required for ring spinning made the process more costly per pound produced.

Rotor spinning inserted twists by means of a rotating conical receptacle into which the fiber was admitted. In "open-end" spinning, air current and centrifugal force carried fibers to the perimeter of the rotor, where they were evenly distributed in a small group. The tails of the fibers were twisted together by the spinning action of the rotor as the yarn was continuously drawn from the center of the rotor. The process was very efficient and reduced the cost of spinning, in part, by eliminating the need for roving. At a speed of 60,000 rotations per minute, open-end rotors produced yarn at a rate three to five times higher than ring spinning. Moreover, the yarn from open-end spinning was much more uniform, but it was also considerably weaker and had a harsher feel. Consequently, low-micronaire[4] but stronger cottons were desirable for open-end spinning.

Financial Climate

Like many of its competitors, Aurora had been struggling financially. The company had not responded quickly to the deteriorating business environment, and had suffered consecutive losses for the past four years (**Exhibit 1**). Currently, the company had limited cash available and had trouble maintaining sufficient working capital. Since 1999, about 150 textile plants had been closed in the United States, and 200,000 industry jobs had been lost. Aurora had closed four inefficient manufacturing operations, and was evaluating the performance of its remaining facilities. Since 2000, the company had succeeded in cutting its SG&A spending by $3.9 million. These efforts had allowed the company to continue operations, but the difficult financial environment was expected to continue to present a challenge for Aurora.

The Zinser 351

The Zinser 351 would replace an older-generation spinning machine in the Hunter plant. The existing machine had been installed in 1997 and was carried on Aurora's books at a value of $2 million. If replaced, the existing machine could be sold for about $500,000 for use in Mexico. Management felt that by the time the machine was fully depreciated in 4 years, it would have no market value. Management also believed that, with proper maintenance, the existing machine could continue to operate for 10 more years, at which point the plant was expected to have grown from its current production level of 500,000 pounds a week to its capacity of 600,000 pounds a week.

[4]Micronaire was a quantification of fiber fineness as measured by air permeability of a fiber sample. A sample of fine fibers would have a high ratio of surface area to mass, allowing less airflow and resulting in a lower micronaire reading. Conversely, a sample of coarse fibers would exhibit a low ratio of surface area to mass, allowing more airflow and resulting in a higher micronaire reading.

To match the current production capacity of the Hunter plant would require the purchase of a machine with 35,000 spindles at a cost of $8.05 million. In addition, there would be an installation cost of $200,000, for a total capitalized cost of $8.25 million.[5] The new spinning machine would be fully depreciated (straight-line) in 10 years, at which point it would have zero book value, but was expected to realize $100,000 if sold on the open market. Aurora had already spent $15,000 on marketing research to gauge customer interest in its yarn as well as $5,000 on engineering tests concerning the suitability of Hunter's ventilation, materials-flow, and inventory systems.

The cost structure of a textile plant was primarily composed of a materials cost (the cost of cotton) and a conversion cost, which included the cost of labor, dyes and chemicals, power, maintenance, customer returns for defects, and various other production and overhead costs. In 2002, the Hunter plant's conversion cost was $0.43/lb. Most of the conversion costs would not be affected if the Zinser replaced the existing spinning machine. For example, there would be no change in the work force, although the current operators would need to be trained on the Zinser, at a one-time cost of $50,000, during the installation year. A significant benefit of the Zinser, however, was that it was expected to reduce power and maintenance costs equivalent to a savings of $0.03/lb. The cost of customer returns constituted $0.077/lb. of the conversion costs for 2002. Based on engineering and marketing projections, Pogonowski estimated that the cost of customer returns would rise to $0.084/lb. for the higher-quality yarn produced by the Zinser. As shown in **Exhibit 5,** the cost per pound was influenced by the return frequency (1.0%), the liability multiplier (7.5), and the expected increase in selling price per pound ($1.0235 × 110% = $1.126). Depreciation and SG&A expenses were not included as part of conversion costs. SG&A was estimated to remain at 7% of revenues for both the existing spinning machine and the Zinser.

Although the Zinser's reliability would reduce the inventory of unprocessed cotton, buffer stocks would be necessary to hedge against the uncertainties surrounding the cotton's timely delivery to the plant as well as slowdowns and shutdowns due to production problems with the spinning machine. The Zinser was becoming widely used by many U.S. yarn producers, and had proved itself a highly reliable machine, with very few production delays, compared with earlier-generation spinning machines. This dependability had allowed most manufacturers to reduce their cotton inventories to 20 days from the average of 30 days (see **Exhibit 6** for cotton spot prices).[6] When asked about this benefit, the Hunter plant manager responded:

> My job is making profits. I just happen to do it by spinning cotton yarn. A big part of those profits comes from controlling our cost of cotton. I do that by buying large quantities of cotton when the price is right. If you look at my cotton inventory over the year, you will see that it varies considerably, depending on whether I think it's a good time to buy cotton or not. On average, I will have about three months of cotton at the plant, but that will fall as low as 20 days when the cotton market is running hot and as high as 120 days when cotton prices hit low points. Given my cost-minimizing strategy, I don't see where the Zinser would actually reduce the cotton inventory. I'm focused on the price of cotton much more than the rate at which we use it in the plant.

[5]The installation cost included a building-modification cost of $115,000, an airflow-modification cost of $55,000, and freight and testing costs of $30,000.

[6]In addition to cotton inventories, plants often carried large finished-goods inventories. Textile manufacturers preferred to ship soon after completing production, but large buyers had increasingly been requiring producers to hold their finished-goods inventories to reduce the buyers' carrying costs.

The Decision

Michael Pogonowski had to decide whether the company should purchase the Zinser or keep using the existing ring-spinning machine. Beyond this specific investment decision, he wondered whether it was in the shareholders' best interest to invest in Aurora when both the company and the industry were continuing to lose money. This was particularly troublesome when he considered that the U.S. textile market would likely experience intense competition when the WTO lifted the ban on quotas in January 2005, which would only worsen Aurora's financial condition and its credit rating of BB, already below investment grade (**Exhibit 7**). Pogonowski was also concerned about the higher liability risks associated with customer returns in the high-end market, where most of the new yarn would be sold. For example, if the frequency of customer returns remained at the current level of 1.5%, it would compromise Aurora's ability to realize the premium margins that had originally attracted the company to enter the segment.

Pogonowski was sensitive to the fact that, over the past four years, shareholders had seen the value of their Aurora holdings fall from about $30 a share to its current price of $12. In light of such poor performance, shareholders might prefer to see the institution of a dividend rather than see money spent on new assets for Aurora. Nevertheless, if buying the Zinser could reverse the downward trend of Aurora's stock price, then it would clearly be a welcome event for the owners. Aurora used a hurdle rate of 10% for this type of replacement decision. Pogonowski felt confident that the Zinser would return more than 10% over its expected life of 10 years, but he was less confident that Aurora would be able to remain in operation over that time span.

EXHIBIT 1 | Consolidated Income Statement for the Fiscal Years Ended December 30, 1999–2002 (dollars in thousands)

	1999	2000	2001	2002
Pounds shipped (000s)	187,673	190,473	151,893	144,116
Average selling price/lb.	1.3103	1.2064	1.2045	1.0235
Conversion cost/lb.	0.4447	0.4421	0.4465	0.4296
Average raw-material cost/lb.	0.7077	0.6429	0.6487	0.4509
Net sales	**$245,908**	**$229,787**	**$182,955**	**$147,503**
Raw-material cost	132,812	122,461	98,536	64,982
Cost of conversion	83,454	84,212	67,822	61,912
Gross margin	29,641	23,114	16,597	20,609
SG&A expenses	14,603	14,218	11,635	10,305
Depreciation and amortization	15,241	13,005	11,196	9,859
Operating profit	**(203)**	**(4,109)**	**(6,234)**	**445**
Interest expense	6,777	6,773	5,130	3,440
Other income (expense)		1,143	(1,232)	(409)
Asset impairments[1]			4,758	7,564
Earnings before income-tax provision	(6,980)	(9,739)	(17,354)	(10,968)
Income-tax provision @ 36% tax rate	(2,513)	(3,506)	(6,247)	(3,949)
Net earnings	**($4,467)**	**($6,233)**	**($11,106)**	**($7,020)**

[1]Costs associated with the shutdown of plants.

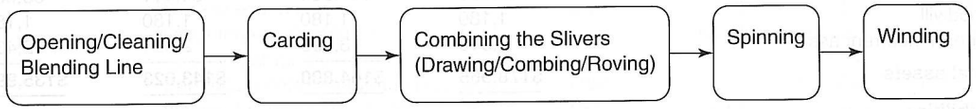
EXHIBIT 2 | Consolidated Balance Sheets as of December 30, 1999–2002 (dollars in thousands)

	1999	2000	2001	2002
Assets				
Cash and cash equivalents	$1,144	$5,508	$2,192	$1,973
Accounts receivable, net	17,322	11,663	20,390	26,068
Inventories	34,778	33,155	31,313	33,278
Other current assets	2,774	1,922	712	2,378
Total current assets	$56,018	$52,247	$54,608	$63,697
Property and equipment				
Land	2,654	2,594	2,516	2,505
Buildings	32,729	31,859	30,308	30,427
Machinery and equipment	230,759	220,615	197,889	190,410
Gross PP&E	266,142	255,068	230,713	223,342
Less accumulated depreciation	(147,891)	(147,104)	(146,302)	(154,658)
Net PP&E	118,250	107,964	84,411	68,684
Goodwill	1,180	1,180	1,180	1,180
Other noncurrent assets	3,516	3,499	2,824	2,430
Total assets	**$178,965**	**$164,890**	**$143,023**	**$135,991**
Liabilities				
Accounts payable	12,236	7,693	9,667	10,835
Accrued compensation and benefits	4,148	3,712	4,176	4,730
Accrued interest	1,830	1,090	961	929
Other accrued expenses	4,083	3,914	3,881	3,657
Current portion of long-term debt	1,009	1,730	0	0
Total current liabilities	$23,306	$18,139	$18,685	$20,151
Long-term debt	66,991	66,991	58,000	58,000
Other long-term liabilities	16,566	14,081	11,776	10,297
Total liabilities	**$106,863**	**$99,211**	**$88,461**	**$88,448**
Shareholders' equity				
Common stock, par $0.01	50	50	50	50
Capital surplus	15,868	15,678	15,668	15,668
Retained earnings	56,184	49,951	38,845	31,825
Total shareholders' equity	$72,102	$65,679	$54,563	$47,543
Total liabilities and shareholders' equity	**$178,965**	**$164,890**	**$143,023**	**$135,991**

EXHIBIT 3 | Production Facilities

Plant	Technology	Product Mix	Count Range	Capacity (pounds/week)
Hunter	Ring	100% Cotton	5/1 to 22/1	600,000
Rome	Rotor	100% Cotton	5/1 to 22/1	1,200,000
Barton	Rotor	Heather and Poly/Cotton Blends	8/1 to 30/1	800,000
Butler	Rotor	100% Cotton	5/1 to 30/1	600,000

EXHIBIT 4 | Industrial Yarn Production



Opening/Cleaning/Blending Line
Cotton was shipped to the mills in bales and still contained vegetable matter. An automated process, designed to take small tufts of fibers from the tops of a series of 20 to 40 bales, opened or separated the fibers into small "clumps," removed any foreign particles in the tufts, and blended the tufts for a more homogeneous product. There was a continuous flow of fibers from the Opening Line to the Card.

Carding
The Card received the small tufts of fibers from the Opening Line and, through a series of metallic wire-covered cylinders, separated the tufts of fibers into individual fibers, which were parallelized, cleaned to remove smaller foreign particles, and formed into a strand of parallel fibers, called a sliver. The strand resembled a large, untwisted rope.

Drawing
The Drawing Process combined six to eight slivers to allow greater uniformity of the drawn sliver.

Combing
The Combing Process was an optional process for ring-spun yarns. Combing removed short fibers (8%–12% of the weight of a sliver), eliminated practically all remaining foreign particles, and further blended the stock.

Roving
The Roving Process reduced the weight of a drawn sliver to the point that a small amount of twist was needed to provide the tensile strength required for ring spinning.

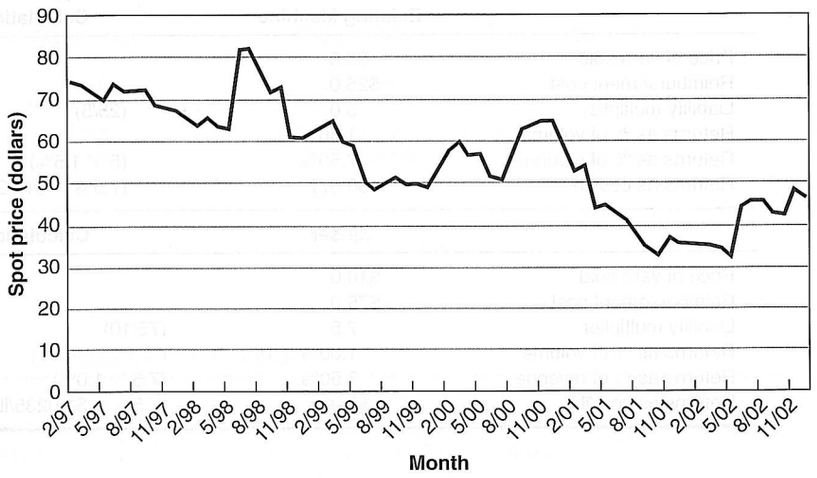
Ring Spinning
Ring Spinning further reduced the weight (linear density) of the strand of roving, added more twist, and created a small package weighing less than half a pound.

Winding
Winding was a process that simply took multiple packages of ring-spun yarn and "spliced" them together into one continuous strand, resulting in a package of yarn weighing three to four pounds.

EXHIBIT 5 | Cost of Customer Returns

	Existing Machine	Calculation
Price of yarn sold	$5.0	
Reimbursement cost	$25.0	
Liability multiplier	5.0	(25/5)
Returns as % of volume	1.50%	
Returns as % of revenue	7.50%	(5 × 1.5%)
Returns as cost/lb.	$0.077	(7.5% × $1.0235/lb.)
	Zinser	**Calculation**
Price of yarn sold	$10.0	
Reimbursement cost	$75.0	
Liability multiplier	7.5	(75/10)
Returns as % of volume	1.00%	
Returns as % of revenue	7.50%	(7.5 × 1.0%)
Returns as cost/lb.	$0.084	(7.5% × $1.0235/lb. × 110%)

EXHIBIT 6 | Cotton Spot Prices (1997–2002)[1]



[1]Source: Bloomberg Database.

EXHIBIT 7 | Interest-Rate Yields: January 2003

U.S. Government (% yield)	
Treasury bill (1-year)	1.24
Treasury note (10-year)	3.98
Treasury bond (30-year)	4.83
Industrials (% yield)	
Prime rate[1]	4.25
AAA (10-year)	4.60
AA (10-year)	4.66
A (10-year)	4.87
BBB (10-year)	5.60
BB (10-year)	6.90

[1]The prime rate was the short-term interest rate charged by large U.S. banks for corporate clients with strong credit ratings.

CASE 21

Compass Records

Still bleary-eyed after an all-night drive from North Carolina, Alison Brown sat in the office below her recording studio near Nashville's famed "Music Row." It was late June 2005, and she had a moment to reflect on Compass Records, the artist-run record company that she and her husband, Garry West, had founded 10 years ago. The past few years had brought them great success, but managing the daily myriad decisions for the business remained a challenge. Foremost in her mind was whether to offer a recording contract to a talented new folk musician, Adair Roscommon, whose demo CD she was now listening to in her office.

Compass Records' tenth anniversary was a major milestone in the intense and unforgiving music business. With a roster of well-known and successful artists under contract, Compass had carved out a niche as an established player in the folk and roots musical genres. But unlike executives at the major record companies who typically had large budgets, every decision made by Brown and West regarding new musicians could have a major impact on their business. Compass could scarcely afford to squander resources on an artist in whom Brown and her husband did not believe strongly.

Brown was an acclaimed folk musician about whom the entertainment industry magazine *Billboard* once wrote: "In Brown's hands, the banjo is capable of fluid musical phrases of boundless beauty." Brown's assessment of another folk musician's artistic merit, therefore, had tremendous value, and she liked Adair Roscommon's work. Brown was also a former investment banker with an MBA who clearly understood Roscommon's potential as an investment for Compass. Intuitively, Brown grasped the implications of adding a risky asset, such as a new musician, to Compass Records' growing portfolio.

The central question for Brown, when contemplating any new musician, was whether to license that artist's music for a limited period of time or to produce and own the artist's master recording outright. In the short term, it was cheaper for Compass to license a recording, but it also limited the company's potential profit. If Compass

This case was prepared by Sean D. Carr, under the supervision of Robert F. Bruner and Professor Kenneth M. Eades of the Darden Graduate School of Business Administration. Certain persons and events in the case have been disguised, and some details have been simplified for expositional clarity. The case is intended to serve as a basis for class discussion rather than to illustrate effective or ineffective handling of an administrative situation.