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RETURNS IN THE WESTERN RANGE CATTLE INDUSTRY: RECONSTRUCTING THE FINANCIAL HISTORY OF THE MATADOR LAND AND CATTLE COMPANY, 1883-1920

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Much has been written concerning the rate of return earned by investors in cattle ranching during the open range era of the American West. Individual and foreign investors supplied large amounts of capital to stock the ranges; fortunes were made and lost in a short 20-year span. Financial histories abound in the literature regarding the return on investments. Most, if not all, rely on published financial data to determine performance. Yet, accounting practices of the time render any financial performance calculated from published financials problematic. This article estimates the financial performance of the Matador Land and Cattle Company for the years 1882-1920 by adjusting the published financial data to conform to modern accounting practices. In doing so, a more accurate picture of the financial performance of a large Scottish cattle firm operating on the open range emerges. Additionally, the article estimates the return that a typical investor earned holding stock in the Matador. Taken together, these measures provide a reflection of the rate of return during the open range era of the American West.

Introduction

To many, the image of rugged American individualism is personified during the mid to late nineteenth century. The land baron, cowboy, and western homesteader are essential characters in this play. Their struggles with nature and each other are legend and steeped in idealism and romanticism. It was also a time when, driven by tales of fantastic rates of return, aspiring entrepreneurs rushed to the West hoping to make a quick fortune. Large amounts of foreign capital began to flow into ranching in the American West creating a speculative boom, which in turn led to rapid over-expansion of the industry. It is a story familiar to students of American history.

Early propagandist James S. Tait (1884) wrote about fantastic profits awaiting anyone willing to risk the necessary capital. He reported that an investment of £30,000 would grow to £300,000 in just three years. Walter Baron Von Richthofen (1885, 82) estimated gains from the natural increase in a herd of cattle grazing on free grass anywhere from "25 to 30 per cent per annum" with some periods earning profits of "50 to 60 per cent". He offered a plan to earn 156 percent return over five years in what he called "a legitimate and safe business" (Richthofen, 31). Others such as John Clay (1962) and William Baillie-Grohman (1880) present the same fantastic tale.

Despite these tales, the literature indicates investments in ranching yielded little financial return during the era. Most estimates regarding returns use data gathered from published financials of the time. Yet, accounting practices of the time rendered published financials problematic at best for discerning returns. Nowhere in the literature have these practices been taken into account before calculating financial performance ratios. As such, these performance measures may not reasonably reflect actual financial returns.

This article provides estimates of the financial performance of the Matador Land and Cattle Company ("the Matador") using their financial statements adjusted for known accounting issues. The Matador was incorporated in 1882 in Dundee, Scotland, and it remained a viable business concern until 1951 when Lazard Freres purchased the famed ranch and subsequently liquidated most of its assets. During the early years, the company operated exclusively in the panhandle region of west

Texas. However, at its zenith, it operated in Texas, Colorado, Wyoming, and the Dakotas as well as leasing pastures in Canada. It was one of the largest and longest-lived foreign-owned cattle operations that began during the era of open range ranching. Cattle ranching may have yielded modest returns, but the central economic question relates to whether these were in line with other investments of the time. Estimates of the total returns to investors in Matador stock are provided and compared to estimates of returns on alternative investments available at the time.

This article improves upon the literature by estimating financial performance for the Matador from two perspectives. The first relates to the Matador management team's use of company assets to earn profits, while the second is from the individual stockholder's profit perspective. We use traditional financial ratios; return on assets, return on equity, earnings per share, and dividend yield based upon adjusted financial statement data to measure management's effectiveness. To measure an investor's return on investment in the stock, we use capital appreciation (depreciation) plus dividends paid. In addition, we construct time series of the risk premium from investing in the Matador. Together, these measures provide a picture of the financial performance of the Matador between 1883 and 1920, and its performance relative to other available investments.

Literature Review

Without a doubt, foreign direct and indirect investment played a significant role in the development of the American West. Many works analyzing English and Scottish foreign direct investment in cattle ranching illuminate this fact. Gene M. Gressley (1966, 105) estimates that, by 1900, the number of incorporated cattle companies in Montana, Wyoming, Colorado and New Mexico reached 879, with total capitalization of $284,593,100, mostly from foreign investment. Ernest Staples Osgood (1970, 102) suggests that from 1883 to 1885, total capitalization of eleven foreign-owned cattle companies reached almost £4,000,000. J. Fred Rippy (1954) reports at least thirteen British corporations were organized to invest in land and cattle in Texas, with £5,082,028 invested by 1886.

Perhaps one of the best-known financial works on the cattle ranching industry is William Turrentine Jackson's (1956) work where he examined

the published financial records of eleven English and Scottish cattle companies between 1883 and 1888. Jackson (1956, 187, 241) estimates the total capitalization of nine companies in 1883 was £1,795,120 in ordinary capital and another £1,209,800 in debenture or preferred capital totaling £3,004,920. By 1885, total capitalization of the eleven companies reached £3,947,089.

While not an exhaustive list of the research, it is accepted that vast sums of capital flowed into western ranching during this era. English and Scottish capital was a particularly important source of funds in the economic development of the American West. Equally important to the history of the open range era is the financial performance of such direct foreign investments.

The most common performance measure used in the literature was dividends paid as a percentage of paid-up capital. Few historical accounts focus on this type of firm performance. Calculating financial performance from dividends alone takes the perspective of an investor who purchases stock and is not necessarily indicative how management employs the firm's assets over the longer term. In comparison, modern financial analysis uses measures such as return on assets that focus on the financial performance of a company.

Yet some notable exceptions do occur. Jackson (1956, 282) mentions that in 1890, the Prairie Cattle Company earned "only two percent on its reduced capital" but does not provide detailed calculations to determine the definition in use. Nevertheless, later he states that in 1890 the Texas Company reported "profits of £12,094, or three percent of the paid-up capital." Here, he uses a modern notion of the return on capital in the only clear mention of an internal return to capital invested.

Conventions, norms and the underlying structure of financial statements from any period play an important role in distorting financial statements of the time. Accounting history researchers have long argued that nineteenth-century accounting practices distort published financials. Trevor Baldwin, Robert Berry and Roy Church (1992, 99) contend that a firm's "failure to distinguish between revenue and capital expenditures" is an important issue when interpreting data from nineteenth-century financials. Moreover, the issue still exists today and is important given the many scandals where firms intentionally misrepresent their financials. The

most notable recent examples were WorldCom Inc. and Enron, who artificially inflated their revenues by booking ordinary expenses as capital expenses. Judith Wale (1990) notes that the practice of charging capital expenditures to income rather than expensing through time, as is the current standard, leads to an underestimation of assets and profits.

Researchers such as Geoffrey Lee (1975), Shelia Marriner (1980), Roger Lister (1981) and Robert Parker (1991) all point out the difficulties in using data from nineteenth-century financials. Following on these articles, Anthony Arnold (1996) argues that after the passage of the consolidating Companies Act of 1856 until 1900 companies had a great deal of leeway in their financial reporting. Many accounting concepts, such as the definition of capital, were unclear. As a result, he argues that "Accounting definitions and accounting practice" led to preparation of financial statements that were "highly diverse rather than uniform" (1996, 43).

Given the issues pointed out by these researchers, great care must be exercised in making statements about a company's financial performance using data published prior to the passage of the Companies Act of 1900. Therefore, it is important to adjust the published financial statements before calculating modern measures of financial performance.

Data Selection and Adjustments

The Matador provides a unique data set to estimate the financial performance of a major nineteenth-century cattle company. Fortunately, a complete set of the published annual profit and loss statements and balance sheets from 1883 to 1951 survive within the archives of Texas Tech University. [1] Additionally, annual stockholders' reports exist for the entirety of the Matador's corporate life.

Generally accepted accounting practices usually result in the following process. Revenue and expense items of a period are presented on the profit and loss statement to calculate income for the period. The resulting income at the end of the period affects the equity of the company—profits increase

[1] Matador Land and Cattle Company Records, 1874-1960, Southwest Collection/Special Collections Library, Texas Tech University, Lubbock, Texas.

equity and losses decrease equity. Additionally, acquisition of long-term resources are capitalized on the balance sheet as assets. Usage of these resources over time results in an expense that appears on the profit and loss statement. The Matador followed this model of accounting with some periodic noted exceptions that distort the published financial data and any performance results calculated from them.

Given the nature of the accounting practices of the period mentioned in the literature review, one might question the usefulness of financial statements for sending market signals to actual and potential investors. Modern financials are reviewed by independent auditors to provide some level of assurance to investors. There was no general statutory audit requirement for UK companies until the Companies Act of 1900, no requirement that a profit and loss statement be presented to shareholders until the Companies Act of 1929, and no requirement that the profit and loss statement be audited until the Companies Act of 1948 (Matthews, 2006, 85, 140).

The Matador went beyond basic legal requirements: it presented fuller financial statements than required and these were subject to audit from inception of the company in 1883. The Matador engaged J.C. Robertson, C.A. as auditor to examine the financial statements of the company and he held this position throughout the time of this study. It is notable that there was no legal requirement for an auditor to be independent, although the appointment was subject to the annual approval of shareholders. Roy Chandler, Richard Edwards and Malcolm Anderson (1993) conclude that the role of auditors during this period was fraud detection and determining balance sheet solvency. However, the auditor's annual reports illustrate the difficulty in ascertaining the correct asset level of the company. He states that he found the financial statements to be correct and the balance sheet and profit and loss statements to be "full and fair" statements of the company's financial position. However, he qualifies this by stating this is true so long as the herd count and its value are as stated by the company. This statement illustrates the difficulty that companies faced generating an accurate herd count during the open range period. As such, the audited financials provided some market signal to investors of the time, but probably not near the extent as after the passage of the Companies Act of 1900.

There are three accounting issues of the time that produce distortions in financial statements relative to the modern standard. First, the Matador by-passed the profit and loss statement by charging some expense/loss transactions directly to equity. For example, rather than recording the cost of acquiring horses as an expense on the profit and loss statement, these expenses were charged directly to equity. This practice overstates profit for the period and any related returns calculations. Some of the transactions that fall into this category were charged to equity post-balance sheet date.

Second, the Matador occasionally experienced significant losses that should have appeared on the profit and loss statement and affected income for the period. Rather than allowing the losses to flow to income, they carried the losses as suspense assets on the balance sheet. Suspense accounts serve as a holding place for transactions that have not been permanently categorized. For example, the Matador created a suspense asset for significant losses to the cattle herd, reducing the asset "herd" for the loss and increasing an asset "suspense-herd", simply reclassifying assets. Eventually, the suspense asset was charged directly to equity. Similar to the first example, this practice bypasses the profit and loss statement and potentially distorts profit for the period and any related returns calculations.

Lastly, acquiring long-term resources normally results in an asset that appears on the balance sheet of the firm. Each period, as the asset is used in the operation of the company, a portion of the asset is reduced on the balance sheet and included as an expense on the profit and loss statement as a depreciation or amortization charge. Compared to this regular practice, the Matador routinely chose to expense immediately the entire cost of long-term resources rather than present them as assets on the balance sheet. This practice understates profit for the period, understates assets for the entirety of the life of the asset, and distorts returns. Each effect is described more thoroughly below. The Appendix sets out the distorting transactions and the correcting adjustments, which are now discussed in more detail.

Allowing firms to charge transactions directly to equity can affect either the profit and loss statement or the balance sheet depending on the nature of the transaction. Handling of the transaction further affects

measures of profitability and analyses of returns. As an example of transactions that generally affect profit and loss, herd reductions due to loss were periodically charged directly to equity reserves, paid-in-capital, or retained earnings. Thus the loss was not reflected in income calculations resulting in inflated published profits and losses and overstatement of returns and dividend payout ratios. These transactions were corrected by charging the losses to profit and loss. This allows the loss to flow to retained earnings through the profit and loss statement. Similarly, transactions that should have been recorded as assets were charged directly to equity. By doing this, the results are understated assets, an overstatement of returns and dividend payout ratios. These transactions were corrected by increasing equity and assets on the balance sheet.

Most problematic was the creation of suspense accounts as an asset on the balance sheet to carry extraordinary losses and periodic pasturage expenses. Substantial cattle losses were not recognized as expenses of the period. Additionally, expenses related to the care of the herd were not recognized as expenses of the period, but were placed on the balance sheet as "suspense assets" for the years 1892-1895. This corresponded to the period when the company attempted to count the herd accurately. These losses were never recognized in profit and loss resulting in overstated profits and overstated assets. Ultimately, they were charged directly to equity (paid-in-capital) further affecting return and payout ratios. Corrections were made to the financial statements by removing the suspense accounts and allowing the losses to flow through the profit and loss statement, which reduces retained earnings, but with a corresponding increase in paid-in-capital.

Least material were transactions where the company expensed items of a capital nature and those that were merely payment of liabilities. Land purchases should be placed on the balance sheet as assets. Debenture stock repurchases should be categorized as reductions of liabilities on the balance sheet. Instead, these transactions were expensed on the profit and loss statement after calculation of initial profit and loss. Although land does not qualify as a depreciable asset, the result is understated profits and assets for the current period and understated assets for future periods. The expensed items were removed from the profit and loss statement and recategorized according to their asset or liability nature.

The Matador's accounting practices resulted in specific effects on the financial statements and any subsequent analysis. To account for these issues, we adjusted the published financial statement data of the Matador to produce two restated series of profit and loss statements and balance sheets. The first restated series is referred to as Internal Use Statements (INT), which allows for adjustments that would be most useful to internal company management rather than by external users such as stock investors. To produce this series, capital transactions remain unadjusted while transactions that bypassed the profit and loss statement and were taken directly to equity were re-categorized as expenses. These re-categorized transactions now flow through the profit and loss statement, so the adjusted internal statements reflect resource flows during the financial statement period.

Additionally, net cattle sales were separated into two components: revenue from cattle sales and expenses related to cattle sales. Net cattle sales included revenues from the sale of cattle, cost of cattle sold, and marketing and selling costs. When possible, revenues and expenses were separated in order to properly reflect returns. One exception to this adjustment should be noted: periodic additions to the herd that were not capitalized (both cattle and horses) were allowed to remain as expenses of the period rather than converted to assets. Our assumption is that the herd was reasonably valued given the information set available to the company management; without additional information on the market value of the herd, treating the additions as assets rather than expenses may result in overstatement of the herd basis.

The second set of adjustments produced statements referred to as Modern Statements (MOD) that would be most useful to both management and investors. This restatement reflects the flow of period resources and a long-range perspective through the capitalization of costs that have long-term economic benefit. Transactions charged to expense of a capital nature were recategorized as assets. Other transactions written off to equity that bypassed the profit and loss statement and asset/liabilities of the balance sheet were recategorized according to their nature.

Results

Table 1 contains descriptive statistics presented in three categories: original (ORIG), internal (INT) and modern (MOD) corresponding to profit and loss statement transactions. The original category represents the data as published and unadjusted. Statistics for the internal category reflect adjustments made to produce the Internal Use Statements and represent the flow of resources during the financial statement period. Statistics for the modern category reflect adjustments made to produce the Modern Statements and represent the flow of period resources and a long-range perspective through the capitalization of costs that have future economic benefit. Examination of Table 1 reveals the extent of the distortion in the published profit and loss statements. A modern calculation of net cattle sales and receipts yields a significant increase after adjustments. The original accounting practices yielded a significant overstatement of average profits and losses on the profit and loss statements by 25.2 percent relative to their levels adjusted for modern accounting practices.

Table 2 contains descriptive statistics for all three balance statements: original, internal use and modern after adjustments for balance sheet transactions. The practices of the time resulted in understating owner's equity, company liabilities and the asset base employed. After adjustments, average owner's equity rose 12.1 percent, liabilities by 6.3 percent and assets by 9.7 percent. Taken together, data presented in Tables 1 and 2 form the basis for the calculations of the Matador's financial performance. As seen in Table 2, the net effect of the adjustments to the Matador's original balances leads to an increase in total assets, total liabilities and total equity. The data labeled MOD in this table form the basis for all subsequent calculations of financial ratios. Additional market-based data will be used to calculate total returns and risk premiums associated with investing in the ranch. The Matador's monthly share prices are available from the *Investor's Monthly Manual* database available online at Yale's School of Management. Knick Harley (1976) argues that the best measure of UK long-term interest rates during the era is the yield on 3 percent consolidated stock ("consols") issued by the UK government and the best measure of short-term rates until the end of World War One is the bill of exchange discount rate. Data for short and long-term interest rates are from the MeasuringWorth database (Officer, 2016).

Table 1
Descriptive Statistics: Annual Cattle Sales, Revenues, Profits (£)
1883-1920

	Average	Low	High
Net cattle sales (ORIG)	54,657	23,703	132,450
Net cattle sales (INT)	71,699	24,713	199,557
Net cattle sales (MOD)	71,699	24,713	199,557
Total receipts (ORIG)	55,820	23,706	138,672
Total revenues (INT)	73,742	24,716	199,567
Total revenues (MOD)	73,742	24,716	199,567
Period profit/(loss) (ORIG)	18,029	(2,142)	56,880
Posted final profit/(loss) (ORIG)*	17,112	(3,381)	56,880
Period profit/(loss) (INT)	10,915	(100,474)	56,880
Period profit/(loss) (MOD)	13,480	(90,474)	56,880

Notes: * After profit and loss calculation but disclosed on face of statement. *Source*: Matador Land and Cattle Company Records

Table 2
Descriptive Statistics: Annual Equity, Liabilities, Assets, Dividends (£)
1883-1920

	Average	Low	High
Total equity (ORIG)	299,620	229,427	383,901
Total equity (INT)	280,637	189,548	355,901
Total equity (MOD)	335,760	199,548	453,390
Total liabilities (ORIG)	206,749	101,789	382,232
Total liabilities (INT)	219,746	112,565	410,901
Total liabilities (MOD)	219,746	112,565	410,901
Total assets (ORIG)	506,371	336,992	738,826
Total assets (INT)	500,382	336,989	738,822
Total assets (MOD)	555,505	400,319	836,311
Dividends t+1	12,696	0	37,000
Shares Outstanding	49,474	40,000	50,000

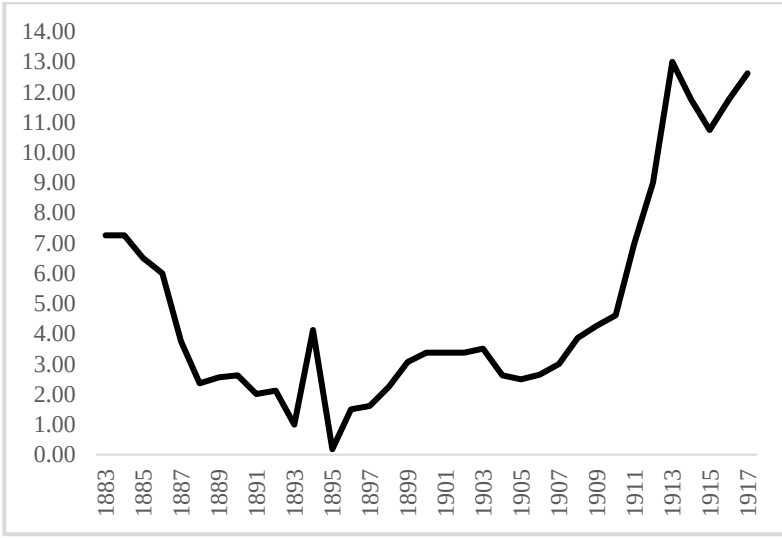
Source: Matador Land and Cattle Company Records

Figure 1 presents the stock price of the Matador on the opening day of each month from June 1883 until December 1917. Matador stock traded at £6.75 per share on the opening day of June 1883. By 1894, Matador stock traded at an all-time low of £0.12 per share. By January 1917, Matador stock had essentially doubled from its initial starting price to £12.62 per share. Data for interest rates are presented in Figure 2. Long-term rates on 3 percent government consols remained relatively steady from 1883 until 1897 reaching a low of 2.15 percent. From 1898 to 1920, long-term rates steadily increased to a high of 4.94 percent in 1920. Short-term rates follow a similar pattern, but display more volatility than long-term rates. Short-term rates bottomed out at 0.745 percent in 1895 and reached a high of 6.21 percent by 1920. Data presented in Figures 1 and 2 provide the adjustments when calculating the risk premium associated with investing in the Matador.

Profit and Investment Ratio Results

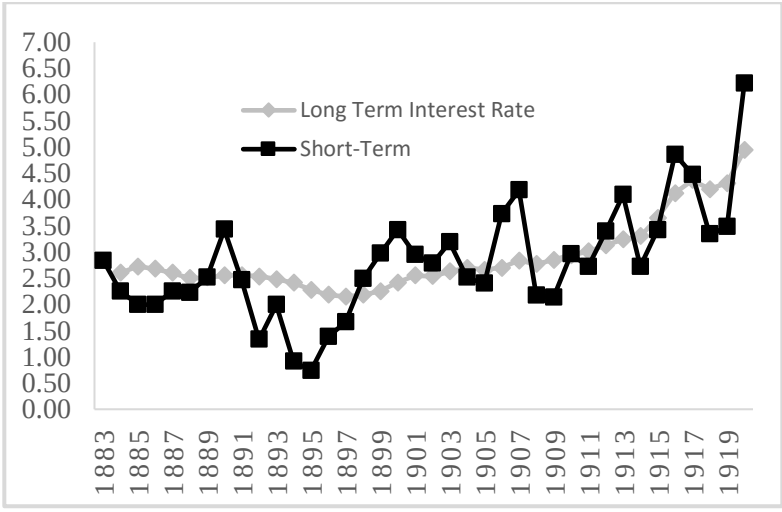
Seven modern financial ratios were calculated to assess the financial performance of the Matador. Four of these are traditional profit ratios used to measure how well managers utilize assets to earn profits. The first measure, return on assets (ROA), measures how successfully a company's management employs its assets to earn profits, and is calculated as net profits after taxes (NPAT) divided by prior year tangible assets multiplied by 100.

$$ROA_t = (NPAT_t / \text{tangible assets}_{t-1}) * 100 \qquad \text{(Equation 1)}$$



Source: *Investor's Monthly Manual*.

Figure 1
Matador January Opening Share Price, 1883-1917 (£)



Source: Officer (2016).

Figure 2
Interest Rates 1883-1913

The second measure, return on owner's equity (ROE), is perhaps the best-known measure of financial performance, which is net profits after taxes divided by stockholder's equity from the prior year multiplied by 100. This ratio measures how much a company is earning from resources invested.

ROE_t = ($NPAT_t$ / stockholder's equity $_{t-1}$) * 100 (Equation 2)

The third and fourth measures reflect that investing in ventures like the Matador entails substantial risk that new enterprises become bankrupt quickly and exit the industry. For this reason, investors typically require a return to risk, or risk premium, relative to safer investments like government consols. We calculate two measures of the risk premium, both of which measure returns to investing in the Matador above what an investor might expect from a safe, fixed income asset.

The long-term risk premium (RLT), is ROE minus the yield on long-term government consols.

RLT_t = (ROE – rate LT govt consols) (Equation 3)

The short-term risk premium (RST) uses the short-term discount rate on bills of exchange to adjust the ROE.

RST_t = (ROE – rate ST disc rate) (Equation 4)

The remaining measures are traditional investment ratios and view performance from an individual investor's perspective. A company's dividend rate (DR) is the annualized dividends paid divided by the number of shares outstanding and is the common ratio used in the discussion of a cattle company's financial performance in the historical literature.

DR_t = (annualized DivPay / #shares outstanding) * 100 (Equation 5)

Focusing on dividends is understandable given their importance to investors during this era. Yet, this measure is limited because it only communicates the amount paid out and contains no information regarding whether the payout was a prudent decision. A better measure from the investor's perspective is the dividend yield (DY), which is dividends paid divided by the market value of the outstanding stock.

$DY_t = (DivPay_t / MV\ shares\ out_t) * 100$ (Equation 6)

This is a measure of how much of the company's market value it pays out each year through dividends and can be compared to the same measure for other companies. The last ratio is the company's earnings per share of common stock (EPS), which is net profits after taxes divided by the number of common shares outstanding. EPS is the most commonly used comparative ratio for marketable equity securities.

$EPS_t = (NPAT_t / \#common\ shares\ out_t)$ (Equation 7)

Table 3 presents the calculations of performance using the original published data based upon five-year averages. We use the geometric mean to calculate the averages for ratios expressed as percentages like the ROA, ROE, DY, RLT and RST. EPS and DR use the arithmetic mean in the average calculations.

Two distinct financial periods emerge. Period one spans the period from initial capitalization in 1883 to 1897 and corresponds to the infancy stage of the industry. Open range land was freely available and anyone with the capital and risk tolerance could stake a claim on the open range. Period two spans 1898 to 1920 and corresponds to the maturing stage of ranching. Barbed wire fences ended open range ranching. New management practices such as actively removing pasture land for the use of hay fields, rotating pastures, and the spread of windmills for stock watering all changed the dynamics of the cattle industry in the West.

Table 3
Matador Financial Performance Measures Original Data
5 Year Averages

Period	ROA (%)	ROE (%)	EPS (£)	DR (£)	DY (%)	RLT (%)	RST (%)
Period 1							
1883 - 1887	2.91	4.96	0.33	0.21	3.11	2.31	2.38
1888 - 1892	0.56	0.87	0.06	0.05	1.98	-1.66	-1.53
1893 - 1897	1.47	2.18	0.11	0.05	3.11	-0.13	0.84
Period 1 average	1.65	2.67	0.17	0.10	2.73	0.17	0.56
Period 2							
1898 - 1902	5.29	7.54	0.38	0.25	8.30	5.15	4.61
1903 - 1907	1.51	2.70	0.14	0.12	4.26	-0.01	-0.50
1908 - 1912	4.50	8.22	0.46	0.29	4.67	5.28	5.56
1913 - 1917	7.32	12.32	0.82	0.65	5.44	8.57	8.38
1918 - 1920	5.18	10.52	0.76	0.56	N/A	6.09	6.25
Period 2 average	4.76	8.26	0.51	0.37	5.67	5.02	4.86
Overall average	3.51	5.90	0.36	0.26	4.38	3.02	3.11

Source: Authors' calculations

The calculations suggest that 1883-1897 was relatively tumultuous compared to post-1897. All of the measures of performance are low with some even negative. Investing in the Matador during the pre-1897 period did not yield much return on investment, whether from the company's or stockholder's perspective. After 1897, all measures of performance improve, with the exception of 1903-1907. Before 1897, the yield above the risk-free rate varied greatly for both the long and short terms. However, the post-1897 period saw a consistent increase in both the long-term and short-term risk premiums indicating that investing in the Matador was paying a substantial rate above what an investor might earn from risk-free assets.

Table 4 presents the same calculations using the modern adjusted financial data. The overall pattern repeats itself with respect to Table 3. Preceding 1898, the ratios are low and begin to improve thereafter. The main departure occurs between 1888 and 1897. Using the original data indicates that the ROA, ROE and EPS were all positive. After adjusting the data to reflect modern accounting practice, a starkly different picture emerges. Six of the ten performance measurements are negative, indicating a period of financial difficulty for the Matador. The DR and DY remain unchanged given these data did not require adjustments.

Taking the whole period 1883-1920, the ROA fell by 42.5 percent from its unadjusted value; ROE decreased 44.7 percent; and the EPS by 16.7 percent. The largest impact occurred in measures of the risk premium. Using the original data, the average long-term risk premium was 3.02 percent while the short-term premium was 3.11 percent. After adjustment, the average long-term risk premium fell to 0.38 percent representing an 87.4 percent decline. The impact is similar for the short-term risk premium. It fell to 0.48 percent representing a decline of 84.6 percent after adjustment.

Separating the adjusted data into two financial periods illustrates the magnitude of the financial difficulties facing the Matador in the early years. Table 5 presents the financial ratios divided into two periods. Prior to 1898, returns, however measured, did not fare well. Returns on assets and owner's equity were negative and the average dividend yield was substantially lower than subsequent periods. As anticipated, investing in Matador stock was substantially riskier than investing in fixed income assets like government consols. Even so, over the next 23-year span, the financial performance of the company improved dramatically. As the industry matured, management employed company assets more efficiently to earn profits, which increased the average yearly return on equity to 6.69 percent. This corresponds to an improvement of 8.82 percentage points over the previous period's return to equity.

Table 4
Matador Financial Performance Measures Modern Adjusted Data
5 Year Averages

Period	ROA (%)	ROE (%)	EPS (£)	DR (£)	DY (%)	RLT (%)	RST (%)
Period 1							
1883 - 1887	2.54	4.55	0.29	0.21	3.11	1.89	2.42
1888 - 1892	-4.01	-6.49	-0.39	0.05	1.98	-9.04	-8.83
1893 - 1897	-1.31	-2.85	-0.11	0.05	3.11	-5.17	-4.23
Period 1 average	-1.21	-2.13	-0.07	0.10	2.73	-4.63	-4.07
Period 2							
1898 - 1902	4.63	6.39	0.40	0.25	8.30	4.00	3.47
1903 - 1907	1.22	2.00	0.13	0.12	4.26	-0.70	-1.20
1908 - 1912	3.91	6.67	0.46	0.29	4.67	3.74	4.02
1913 - 1917	6.35	10.53	0.84	0.65	5.44	6.79	6.60
1918 - 1920	4.62	8.92	0.76	0.56	N/A	4.40	4.60
Period 2 average	4.09	6.69	0.50	0.37	5.66	3.65	3.37
Overall average	2.05	3.26	0.30	0.26	4.39	0.38	0.48

Source: Authors' calculations

Table 5
Summary of Adjusted Financial Ratios

	Period 1 1883-1897	Period 2 1898-1920
ROA (%)	-1.21	4.09
ROE (%)	-2.13	6.69
DY (%)	2.73	5.66
RLT (%)	-4.63	3.65
RST (%)	-4.07	3.37

Source: Table 4 above

Individual investors fared well during this time earning an average long-term risk premium of 3.65 percent and a return to short-term risk of 3.37 percent. Additionally, the Matador paid out an average of 5.66 percent of its market value to investors over this period. All are dramatic improvements over the previous period.

Recap of Financial Effects

The main impact on performance measures in Tables 3 and 4 was how the Matador accounted for extraordinary losses and certain routine expenses. The largest impact was the treatment of extraordinary inventory costs which include missing cattle resulting from theft, natural causes and inaccurate herd counts. Prior to 1892, an accurate herd count did not exist and management estimated a relatively small annual herd loss and wrote the loss to income. By 1890, it was clear the herd count was substantially inflated. After ascertaining a correct count, in 1892 and 1893 the Matador corrected this by writing off £182,313 relating to the inaccurate herd count. They carried this loss to a suspense account rather than recognizing the losses in the years they occurred. Together, these practices led to an increased ROA and ROE using the original data. Once properly recorded as expenses to the profit and loss statement, the rate of return to assets and equity declined dramatically. Additionally, the measures of risk declined along with the rate at which the Matador paid out its market value to investors.

Individual Investor Results

Much has been written regarding the poor return an individual Matador investor earned. Herbert O. Brayer (1949, 98) argued that while some companies yielded profits, short-term investors "lost approximately £5,000,000 between 1880 and 1910". Thus far, no systematic attempt to calculate the total return to investors exists in the literature. This section provides estimates of the total return from investing in Matador stock.

Stock returns arise from two separate sources. Dividend yield and capital appreciation (depreciation) resulting from changes in the price of a stock determine the total return. Table 6 contains the components of Matador's total return from 1883 to 1917 along with the returns to a

weighted portfolio of stocks for the North America region traded on the London Stock Exchange provided by Richard Grossman (2015).

Grossman provides unweighted returns (U) along with returns weighted by market capitalization (MC) and paid up capital (PC). Separating the returns out for the two periods mentioned earlier further illustrates the financial turmoil of the early period. Matador stock significantly underperformed North American stocks in capital appreciation, dividend yield, and total returns. Investors saw the capital value of their stock holding depreciate on average 9.69 percent annually. On the opening day of January 1895, Matador stock traded at an all-time low of £0.18 per share, down significantly from £7.25 per share on the opening day of January 1884. The lone bright spot was the positive annual dividend yield. Investors realized a portion of the depreciated stock value in the form of a positive dividend yield. Still, the period was not kind to Matador investors, both absolutely and relative to returns to North American stocks.

After 1897, Matador stock significantly outperformed North American stocks on all three measures. As the industry matured and the Matador management began utilizing better practices, the return to investors improved. Matador stock value appreciated 10.81 percent annually and by 1917 the stock price nearly doubled to £12.62 per share over its opening price in 1883. The Matador paid an average 5.66 percent of its market value to stockholders in the form of a dividend yield. During the same period, the weighted average of North American stocks paid out 6.27, 2.60 or 1.73 percent of their market value to investors depending on the weights used. Finally, the total return was significantly higher than North American stocks as a whole; holders of Matador stock earned a total return of 16.47 percent while the market earned less depending on the weights used.

However, if investors held Matador stock for the entire 34-year period, their total return would be very comparable to that earned on North American stocks. Total return earned by Matador investors was 6.25 percent while the total return on North American stocks varied from 4.09 to 6.57 percent. Matador investors earned an average dividend yield of 4.39 percent while the comparison stocks returned an average dividend yield of 1.33 to 5.20 per annum depending on the weights used.

Table 6
Comparison of Average Annual Stock Returns, 1883-1917

	Matador	North America		
		U	MC	PC
1883-1897				
Capital Appreciation (%)	-9.69	-6.90	1.46	2.33
Dividend Yield (%)	2.73	4.26	2.23	0.99
Total Return (%)	-6.96	-2.64	3.68	3.32
1898-1917				
Capital Appreciation (%)	10.81	8.13	7.08	5.50
Dividend Yield (%)	5.66	6.27	2.60	1.73
Total Return (%)	16.47	14.40	9.68	7.23
Overall				
Capital Appreciation (%)	1.86	0.09	4.17	2.76
Dividend Yield (%)	4.39	5.20	2.40	1.33
Total Return (%)	6.25	5.29	6.57	4.09

Sources: *Investor's Monthly Manual* and Grossman (2015), Table A6

Conclusion

While caution must be exercised when extrapolating from an individual firm to an entire industry, it appears the financial history of the Matador is typical in that it reflects evolution from the chaos of the early years that plague new industries to a more stable long-term basis after less efficient competitors exit the industry. After 1894, better management practices yielded better performance for the Matador and management accounting practices evolved.

Another potential issues is the bias in the returns related to survivorship bias. As the weaker firms tended to exit the market, returns naturally increase. Returns may well increase, however, this might not be related to superior management skills. It is also true that while returns

increased, over the period examined, it was approximately 30 years before the return was in line with that of other investments.

After adjusting the published data for historic accounting practices, a more accurate picture of the financial performance of the Matador emerges. The early years were particularly difficult from the perspectives of both management and the individual investor. The main driver of poor financial performance was the extreme difficulty in ascertaining the correct herd count. By 1890, it was apparent to both management and investors that the herd count carried on the books was incorrect and significantly inflated. After replacing their ranch manager, the Matador accurately counted the herd for the first time around 1892.

Once the herd count was corrected and management began to adapt their practices, both the internal rate of return and investor's total return improved. Returns to assets and equity increased significantly. After 1897, Matador investors earned a total return far greater than an alternative portfolio.

As with much research, more questions arise than were answered. For example, what drove Matador investors to maintain their investment for the long-run when there were numerous other investments available? We postulate that for sophisticated investors, a cattle business on the open range of the American West was the means used to enter a vibrant and risky new market which eventually could result in vast land ownership in a developing geographic area and nation. Investors with a strategic perspective would have to be able to sustain the organization for a substantial period of time to reap the benefits of the investment.

During this period, the UK was exporting large sums of capital around the world. An interesting question would be whether the initial investors in the Matador took advantage of this opportunity to diversify their total investment portfolio while at the same time, investing in the potential for large returns from land holdings. As such, the large early fluctuations in returns may have been of secondary importance to such investors.

We refer to the Internal Use Statements (INT) which represent the resource flows for each period as the baseline that management and sophisticated investors would use to determine whether tactical measures were producing outcomes that could be maintained. The Internal Use Statements are a modified cash-basis product that results in the lowest

profit; smallest value of assets; liabilities higher than the originally published version of liabilities; and lowest amount of equity. In other words, they represent the stark, short-term reality of the investment. A full analysis of the land acquisition activities of the Matador would provide further evidence of strategic investment.

Finally, were the miscategorizations of financial transactions the result of the underdeveloped accounting practices of the time or were they the result of deliberate attempts to mislead investors? An examination of other existing financial records of publicly-traded cattle companies of the time to compare the manner in which transactions were recorded might reveal insight into this question.

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Appendix

Appendix	Year	Amount	External - Original transaction	Internal - Resource flow perspective	Modern - Income Statement/Balance Sheet
Profit & Loss Transactions:					
Herd loss	1891	**£ 20,000**	charged to *Reserve (equity)*	adjust as *Loss (income)*; flow to *Retained Earnings*; transfer from *Reserve* to *Retained Earnings*	
Herd loss & recovery	1892	£ 88,332			
	1893	44,019			
	1895	(8,441)			
		£123,910	charged to *Suspense (asset)*	adjust as *Loss (income)*; flow to *Retained Earnings*; reduce *Suspense*	
Herd loss	1896	**£ 838**	charged to *Paid-in-Capital (equity)*	adjust as *Loss (income)*; flow to *Retained Earnings*; transfer from *PIC* to *Retained Earnings*	
Herd loss	1897	**£ 500**	charged to *Retained Earnings (equity)*	adjust as *Loss (income)*; flow to *Retained Earnings*	
Cattle & pasturage costs	1893	£ 5,406			
	1894	2,432			
	1895	1,878			
		£ 9,716	charged to *Suspense (asset)*	adjust as *Expense (income)*; flow to *Retained Earnings*; reduce *Suspense*	
Income taxes					
Liability Transactions:	1898	**£ 3,000**	charged to *Retained Earnings (equity)*	adjust as *Expense (income)*; flow to *Retained Earnings*	
Debenture stock repurchases	1898	£ 2,000			
	1899	200			
	1900	600			
	1901	100			
		£ 2,900	charged to *Profit&Loss (income)*	various methods allowed for debenture stock redemption; reduce *Expense*; increase *Retained Earnings*; flow directly to *Liabilities*	
Capital Transactions:					
Capital improvements	1892	**£ 10,000**	charged to *Suspense (asset)*	adjust as *Expense(income)*; flow to *Retained Earnings*; reduce *Suspense*	
Railroad construction	1896	£ 60,857			
Capital improvements	1898	3,736			
Land purchase	1899	5,465			
Land purchase	1900	2,794			
Land purchase	1901	2,611			
Railroad construction	1913	17,500			
Railroad construction	1914	2,053	charged to *Retained Earnings (equity)*	adjust as *Expense (income)*; flow to *Retained Earnings*	
		£ 95,016			

No further adjustment

reduce *Expense (income)*;
increase *Retained Earnings*;
increase related *Asset*