Ameritrade Case Study

CIOCCOLATO FONDENTE GROUP – BIEF 21

CERIOTTI NICOLÒ, DE ANGELIS GIORGIO, MACCIONI ANTONIO,
SCHIPANI MARTINA, TOLOSA ANDREA

Executive Summary

Ameritrade Holding Corporation is evaluating the profitability and the risk of an investment in both technology and advertisement, which aims at further enlarging the company's customer base to become the deep-discount brokerage industry leader. The firm's 30.5% estimated cost of capital is a benchmark to which the potential additional riskiness of the project must be added. The project should be implemented in case its risk-adjusted COC is below the expected ROI. Therefore, if the estimates of the return on the investment are anchored to the CEO's, there is the chance that the investment will be profitable.

Summary of facts

Ameritrade (AMTD) plans to invest up to $100 million in technology enhancements and to make its advertisement budget almost eight times larger than the previous two years, eventually reaching an amount of $155 million for the 1998-1999 period. In the event of success, the investment will enable the company to reduce its commission fees per trade and therefore to increase its market share by attracting new customers. Since the planned investments strongly affect the commissions earned from transactions and the management is also willing to invest in case of a high risk-return ratio, an analysis of the project risk must be carried out.

Statement of Problem

The core of the problem is to provide a reliable estimate for Ameritrade's cost of capital. To overcome the scarcity of the firm's available stock market data due to the recent IPO, the analysis focuses on comparable companies' financial figures.

Analysis

Among the factors to be considered by the management when evaluating the investment, market elasticity plays a significant role. If the market is as elastic as predicted, the company will successfully profit from

the trading fees cut. On the contrary, a market crash would discourage trading and thus be detrimental to the project. That is because the aim of the investment is not only to consolidate existing relationships with active traders, but also to attract brand new potential financial market actors. Additionally, the technological enhancements would increase the operating leverage of the firm. This, coupled with an eventual decrease in the number of customers, would in turn drive down variable costs, leaving fixed costs unchanged, therefore increasing the chances of losses. However, the constant increase in money supply experienced by now (Exhibit 1) is forecasted to continue resulting in a potential increase in customers' willingness to invest as liquidity increases. In such scenario, Ameritrade would be able to outperform its competitors by counting on its technological infrastructure whilst enhancing its reliability.

Alongside macroeconomic factors, the analysis focuses on providing an estimate of the company's cost of capital as a benchmark for the project riskiness. Since Ameritrade is not carrying any current debt and the deep discount brokerage industry seems to be characterized by low financial leverage (Exhibit 2), we assume the COC equal to the company's cost of equity. Moreover, since the time lapse between Ameritrade's IPO and the potential investment is too short to have a reliable amount of market data, Charles Schwab (SCHW), Quick & Reilly (QAR) and Waterhouse Investor Services' (WHO) financial figures are taken into consideration. The above three firms' core business is based on providing brokerage services, which makes them very similar to Ameritrade. Although E*Trade shares the aforementioned features, it will be excluded from the analysis as the little amount of data provided makes the estimate of its cost of capital and beta unreliable. The COC is derived from the CAPM, which links the firm's asset beta to the market return and the risk-free rate. We have decided to use the annualized yield to maturity of the 5-years bond (Exhibit 3) as a measure of the risk-free rate, as we believe the investment to have a time horizon of approximately 5 years, due to the continuous technological progress which characterizes the industry. The choice of using the 1950-1996 average total annual return on small companies' stocks is calibrated to reflect the relatively small AMTD market capitalization and to avoid considering the

effects of extraordinary events (ex. WWII), which are instead included if we examine a longer time period (1929-1996). The standard deviation of small companies being greater than that of larger ones (Exhibit 4) is a built-in feature that does not imply a lower data reliability. In order to find Ameritrade's COC through the CAPM, we first assessed the levered betas of the comparable companies (Exhibit 5) running regressions between the excess returns of each firm's stocks and the excess market return (Exhibit 6). For what concerns the risk-free rates, we opted for the daily six months T-bill ones and, while there is no statistically significant difference between the latter and any rate on short term US government securities, we still used the daily for the purpose of matching the date in which the return on stocks has been recorded with a unique rate of return. When it comes to markets instead, we considered the market monthly return on the NYSE, AMEX, & Nasdaq value weighted average because it reflects the market conditions more accurately than the Equally Weighted one. We then unlevered the betas of QAR, SCHW and WHO to account for their different capital structures (Exhibit 7). Since they also differ in percentage revenues from brokerage and market capitalization, we computed Ameritrade's beta as a weighted average of the three. This has been a two-step adjustment: firstly, we have given more value to firms with the lowest spread in terms of market capitalization and percentage brokerage revenues with respect to Ameritrade; then, we gave more importance to the latter as we believe it to be a better discriminant than the former. The resulting unlevered beta for Ameritrade is 2.097 and, applying the CAPM, the cost of capital for the firm is estimated to be 30.5046% (Exhibit 8). The COC is based upon historical data, which reflect a period of great enthusiasm in financial markets and faith in tech development. Nonetheless, we believe the estimated COC to be a realistic value to which the evaluation of the project riskiness should be anchored.

Conclusion and Recommendations

Given the aforementioned cost of capital, we recommend the management to agree upon a realistic return on investment in order to correctly evaluate whether the investment returns more than it costs.
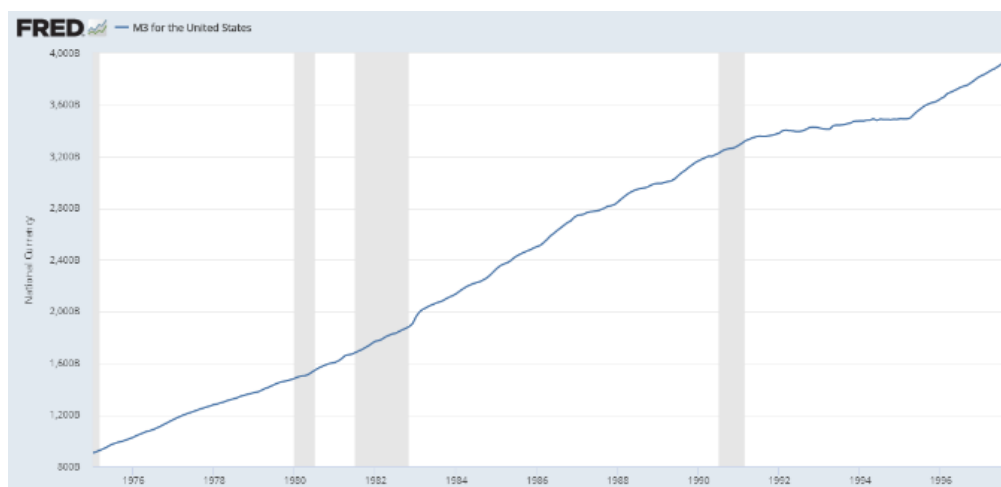
Tables and Exhibits

Exhibit 1[1]

Exhibit 2[2]

Firm Name (Industry)	Debt/Value (Market Values)		Debt/Value (Book Values)		Brokerage Revenues (%)
	Current	Avg 1992-1996	Current	Avg 1992-1996	
Charles Schwab Corp (Discount Brokerage)	0.05	0.08	0.25	0.30	82
E*Trade (Discount Brokerage)	0.00	NA	0.00	NA	95
Quick & Reilly Group (Discount Brokerage)	0.00	0.00	0.00	0.00	81
Waterhouse Investor Srvcs (Discount Brokerage)	NA	0.38	NA	0.70[c]	99

Exhibit 3[3]

Annualized Yield to Maturity	
3-Month T-Bills	5.24%
1-Year Bonds	5.59%
5-Year Bonds	6.22%
10-Year Bonds	6.34%
20-Year Bonds	6.69%
30-Year Bonds	6.61%

Exhibit 4[4]

	Average Annual Return	Standard Deviation
Large Company Stocks[c]	12.7%	20.3%
Small Company Stocks[d]	17.7%	34.1%

[c]Standard and Poor's 500 Stock Price Index.
[d]A subset of small cap stocks traded on the NYSE (1926-1981); Dimensional Fund Advisor's Small Company Fund (1982-1997).

Exhibit 5[5]

Dates	Risk free rate	QAR excess return	SCHW excess return	WHO excess return	VW NYSE, AMEX & Nasdaq excess return
31-Jan-92	0.0407	-0.04971	0.01000	-0.07706	-0.04235
28-Feb-92	0.0414	0.00151	0.00174	0.18973	-0.02811
31-Mar-92	0.0432	-0.03881	-0.00185	0.12347	-0.06688
30-Apr-92	0.0397	-0.28861	-0.21486	-0.22689	-0.02585
29-May-92	0.0396	-0.03588	-0.02644	0.01495	-0.03308
30-Jun-92	0.0377	-0.06096	-0.22385	-0.25034	-0.05694
31-Jul-92	0.0338	-0.07547	0.01663	-0.00460	0.00613
31-Aug-92	0.0335	-0.05437	-0.11979	-0.24201	-0.05426
30-Sep-92	0.0292	-0.00372	-0.22920	0.01625	-0.01678
30-Oct-92	0.0329	0.01058	0.09543	0.05406	-0.02200
30-Nov-92	0.0358	0.17634	0.19260	0.29220	0.00439
31-Dec-92	0.0338	-0.05843	0.01645	-0.04585	-0.01626
29-Jan-93	0.0316	0.05931	0.12859	0.20011	-0.01927
26-Feb-93	0.0314	-0.06029	0.03885	-0.06605	-0.02595
31-Mar-93	0.0309	0.01237	0.09651	0.02038	-0.00589
30-Apr-93	0.0307	-0.10443	-0.13138	-0.12826	-0.05621
28-May-93	0.0332	0.01058	0.04314	0.43977	-0.00378
30-Jun-93	0.0322	0.12830	0.18057	0.19716	-0.02707
30-Jul-93	0.0328	0.03214	-0.01350	-0.04773	-0.03356
31-Aug-93	0.0321	0.10936	0.10152	0.26714	0.00724
30-Sep-93	0.0313	0.00441	0.01813	0.14465	-0.03069
29-Oct-93	0.0328	-0.04314	-0.02773	-0.09016	-0.01476
30-Nov-93	0.034	-0.07651	-0.11342	-0.21654	-0.05135
31-Dec-93	0.033	0.06300	-0.01731	-0.20776	-0.01355
31-Jan-94	0.0325	-0.04299	-0.11914	-0.03250	-0.00117
28-Feb-94	0.0372	-0.22745	-0.10500	-0.07249	-0.06129
31-Mar-94	0.0392	-0.13612	-0.06193	-0.17944	-0.08494
29-Apr-94	0.0445	-0.01523	0.01392	-0.13670	-0.03467
31-May-94	0.0487	-0.02519	0.01738	-0.09557	-0.03920
30-Jun-94	0.0483	-0.10411	-0.23012	-0.17125	-0.07568
29-Jul-94	0.0487	-0.07333	0.03494	-0.07674	-0.01829
31-Aug-94	0.0503	0.13637	0.09923	0.27278	-0.00747
30-Sep-94	0.0543	-0.16968	-0.09089	-0.22342	-0.07295
31-Oct-94	0.0572	-0.06203	0.13926	0.08439	-0.04233
30-Nov-94	0.0622	-0.09637	-0.16114	-0.17848	-0.09927
30-Dec-94	0.0651	0.08136	0.02902	-0.20545	-0.05235
31-Jan-95	0.064	0.02411	0.08553	0.11967	-0.04345
28-Feb-95	0.0619	0.08110	0.04748	0.13638	-0.02228
31-Mar-95	0.0613	-0.04701	0.02884	-0.13324	-0.03433
28-Apr-95	0.0608	0.08357	0.00308	-0.09181	-0.03592
31-May-95	0.0583	0.09862	-0.03640	0.06170	-0.02414
30-Jun-95	0.0559	0.11777	0.19767	0.25839	-0.02506
31-Jul-95	0.0563	-0.00511	-0.00319	0.14479	-0.01563
31-Aug-95	0.0553	-0.08192	-0.04446	-0.01005	-0.04596
29-Sep-95	0.0557	0.17172	0.18827	0.05784	-0.01931
31-Oct-95	0.0555	-0.27893	-0.26533	-0.28099	-0.06665
30-Nov-95	0.0546	0.01677	0.00551	-0.05460	-0.01163
29-Dec-95	0.0517	-0.24382	-0.22180	0.20146	-0.03630
31-Jan-96	0.0497	0.08445	0.20073	-0.09515	-0.02161
29-Feb-96	0.0505	0.08197	-0.03557	-0.00817	-0.03445
29-Mar-96	0.052	0.07181	-0.03729	0.30333	-0.04080
30-Apr-96	0.053	-0.01910	-0.10459	0.03314	-0.02787
31-May-96	0.0536	0.05935	-0.06380	-0.04326	-0.02688
28-Jun-96	0.0537	-0.09429	-0.04339	-0.04005	-0.06136
31-Jul-96	0.0547	-0.18162	-0.06797	-0.04123	-0.10809
30-Aug-96	0.0549	-0.02124	-0.01863	-0.05570	-0.02268
30-Sep-96	0.0537	-0.14772	-0.13370	-0.04032	-0.00071

---

[5] Daily six months T-bills rates; excess returns of comparable firms considering stock prices adjusted backwards for dividends and stock splits; monthly returns VWNYSE, AMEX & Nasdaq.
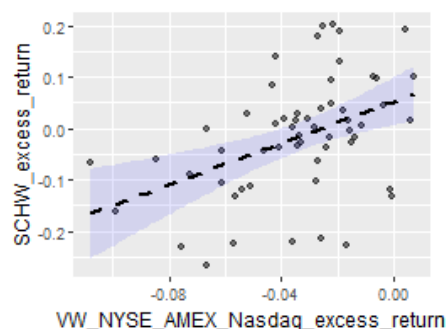
Exhibit 6[6]
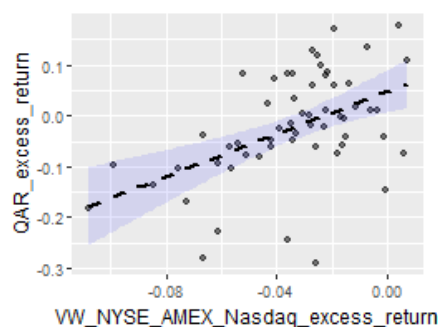

```
Response variable    : QAR_excess_return
Explanatory variables: VW_NYSE_AMEX_Nasdaq_excess_return
Null hyp.: the effect of VW_NYSE_AMEX_Nasdaq_excess_return on QAR_excess_return is zero
Alt. hyp.: the effect of VW_NYSE_AMEX_Nasdaq_excess_return on QAR_excess_return is not zero

                                         coefficient std.error t.value p.value
(Intercept)                                    0.048     0.021   2.328   0.024 *
VW_NYSE_AMEX_Nasdaq_excess_return              2.092     0.493   4.247 < .001 ***

Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

R-squared: 0.247,  Adjusted R-squared: 0.233
F-statistic: 18.037 df(1,55), p.value < .001
Nr obs: 57
```
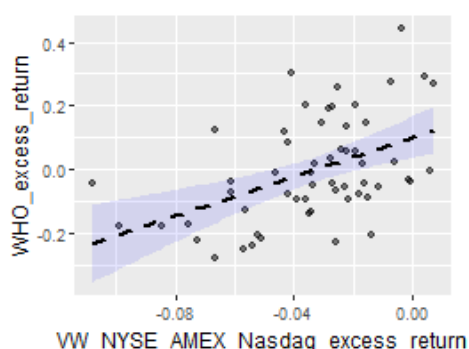


```
Response variable    : SCHW_excess_return
Explanatory variables: VW_NYSE_AMEX_Nasdaq_excess_return
Null hyp.: the effect of VW_NYSE_AMEX_Nasdaq_excess_return on SCHW_excess_return is zero
Alt. hyp.: the effect of VW_NYSE_AMEX_Nasdaq_excess_return on SCHW_excess_return is not zero

                                         coefficient std.error t.value p.value
(Intercept)                                    0.053     0.023   2.247   0.029 *
VW_NYSE_AMEX_Nasdaq_excess_return              2.023     0.555   3.647 < .001 ***

Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

R-squared: 0.195,  Adjusted R-squared: 0.18
F-statistic: 13.299 df(1,55), p.value 0.001
Nr obs: 57
```



```
Response variable    : WHO_excess_return
Explanatory variables: VW_NYSE_AMEX_Nasdaq_excess_return
Null hyp.: the effect of VW_NYSE_AMEX_Nasdaq_excess_return on WHO_excess_return is zero
Alt. hyp.: the effect of VW_NYSE_AMEX_Nasdaq_excess_return on WHO_excess_return is not zero

                                         coefficient std.error t.value p.value
(Intercept)                                    0.101     0.033   3.075   0.003 **
VW_NYSE_AMEX_Nasdaq_excess_return              3.081     0.778   3.961 < .001 ***

Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

R-squared: 0.222,  Adjusted R-squared: 0.208
F-statistic: 15.686 df(1,55), p.value < .001
Nr obs: 57
```

Exhibit 7[7]

	QAR	SCHW	WHO
Debt/equity (market value)	0.0000	0.0800	0.3800
Levered beta	2.0919	2.0229	3.0810
Unlevered beta	2.0919	1.8731	2.2326
Weights	31.65%	25.61%	42.79%

Exhibit 8[8]

Ameritrade	
Beta	2.09711
Risk free rate	6.22%
Market return	17.70%
Cost of capital	30.5046%

---

[6] Regression analysis aimed at estimating the levered betas for the comparable firms. The analysis is conducted over the 1992-1996 period as it is the only time frame for which the figures of the market value of debt to equity used to unlever the beta were available.

[7] Unlevered Betas computed dividing the levered ones by the adjusting factor (i.e. 1+D/E). Then the estimate of the unlevered beta for Ameritrade (Exhibit 8) is computed by weighting that of the comparable firms according to similarities in terms of source of revenues and market capitalization. In particular, weighting more the former (0.7) than the latter (0.3).

[8] Estimate of the COC for Ameritrade according to the CAPM, given the unlevered beta estimate, the 5-years US government bond annualized yield to maturity (Exhibit 3) and the average annual return of a subset of small cap stocks traded on the NYSE (Exhibit 4).