VCU School of Business

FIRE 451 Options, Futures & Swaps

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Southwest Airlines

Introduction:

Southwest Airlines has been operating as a major passenger airline in the United States for 50 years now. They offer competitive rates against the other major U.S airlines and are one of the few remaining that offer 2 free checked bags, provided they are under 50lbs. Southwest has developed reward loyalty programs along with business initiatives in order to stay competitive in their business lifecycle. Profits come from paying passengers and certain expenses are unavoidable. We'll take a look at what Southwest is doing in order to stay profitable in a competitive industry.

By taking a look at the company's 10k filing we see how Southwest has been managing its risk factors and utilizing their derivative contracts, more specifically their fuel derivative contracts. The airline industry is extremely sensitive to economic factors, normally those are energy prices, but all travel companies are hurting right now due to a global pandemic.

Jet fuel costs have risen over the past several years putting pressure on airlines to maintain profitability. Over-the counter derivatives on jet fuel are very illiquid which makes them expensive and not available in quantities sufficient to hedge. Exchange-traded derivatives are not available in the United States for jet fuel, so airlines must use futures contracts on commodities that are highly correlated with jet fuel, such as crude and heating oil. Southwest employs a variety of hedging strategies by using a combination of products.

Domestic airlines have a variety of hedging strategies available to them. These include using both over-the-counter and exchange-traded derivatives and remaining unhedged. Options, including collar structures, and swaps are the primary derivatives used by airlines. By not hedging, airlines are taking on the risk of rising energy prices into their business model, but, when fuel prices rise dramatically, airlines cannot pass all of the cost on to their customers, therefore they will incur a loss.

In the early 2000's, while the airline industry as a whole was impacted by the 9/11 terrorist attacks, Southwest Airlines was able to recover quickly. Three days after the attacks, Southwest resumed service. Over the following weeks, months, and years, other airlines laid off thousands of employees and reduced flight schedules, but Southwest maintained both employment and its schedule, primary due to mitigating its risk with the use of derivative contracts.

Derivative Uses:

Southwest manages its risk of volatile jet fuel prices by utilizing over-the-counter fuel derivative instruments to hedge a portion of its future jet fuel purchases. Energy prices can fluctuate in short amounts of time. Over half of their operating costs go towards fuel, therefore Southwest wanted to try and reduce their risk exposure as much as possible. A jet fuel swap is an agreement where a floating rate debt is exchanged for a fixed rate debt, over a specific amount of time. Jet fuel swaps are also used to hedge numerous other commodity risks including oil, electricity, natural gas, etc. The term "swap" describes the trade between buyers and sellers, they are "swapping" cash flows. The financial derivative instruments utilized by Southwest are a combination of collars, purchased call options, call spreads, put spreads, and fixed price swap agreements.

If Southwest tries to hedge their fuel cost risk, this can lead to multiple benefits such as, lower volatility in profits and lowering their average cost of capital. Southwest can avoid sudden spikes in expenses, meaning they won't suddenly need to scramble for money in unforeseen circumstances. An airline with stable cash flows can take market share from struggling competitors.

Airlines hedge with jet fuel swaps in order to fix or lock in their jet fuel costs. Refiners can utilize jet fuel swaps in order to lock in or fix their profit margins. Swaps are also utilized by hedging their exposure to foreign exchange rates, interest rates and numerous other commodity price risks. If Southwest does not engage in some form of hedging there is no offset of risk or protection against rising fuel costs.

For 2019, Southwest had fuel derivative instruments in place for up to 73% of its fuel consumption. As of December 31, 2019, Southwest also had fuel derivative instruments in place to provide coverage at varying price levels, but up to a maximum of 59% of its 2020 estimated fuel consumption, depending on where market prices settle. Figure 1.1 below provides information about Southwest's volume of fuel hedging on an economic basis:

Interest Rate Swaps:

Southwest has interest rate risk in the form of floating-rate debt obligations and interest rate swaps, along with market risk with the derivatives used to manage its fuel hedging program. They purchase jet fuel at market prices but try and manage market risk through hedging strategies. Southwest utilizes financial derivative instruments, on a short-term and a long-term basis, as a form of insurance against the potential for increases in fuel prices. Southwest believes there can be significant risk in not hedging against the possibility of such fuel price increases, especially in energy markets where prices are high and/or rising. They expect to consume approximately 2.2 billion gallons of jet fuel in 2020. Due to unforeseen circumstances, they will be recalculating new projections. Based on this anticipated usage, a change in jet fuel prices of just one cent per gallon would impact their fuel and oil expense by approximately $22 million for 2020, excluding any impact from their fuel derivative instruments.

Southwest also has some risk associated with changing interest rates due to their short-term invested cash and short-term investments which totaled $2.5 billion, and $1.5 billion respectively. Southwest currently invests available cash in certificates of deposit, high rated money market instruments, investment grade commercial paper, treasury securities, U.S. government agency securities, and other highly rated financial instruments. Because these are short term investments, the returns are closely related to the short-term floating interest rates.

Conclusion:

Southwest Airlines was able to differentiate themselves from their competitors by offering the lowest prices. This appealed to many people who were not impressed with the additional services such as in-flight meals or wanted to avoid busy airports. Southwest Airlines provided a medium in which city-to-city transportation was possible with the lowest costs. They have weathered through several economic downturns and has proven itself to have the potential to be a leader of its industry. The recent poor economic conditions has placed many airline companies in debt, while Southwest Airlines was able to make a profit and its competitors weakened, we'll see what holds next for the company.

Dynex Capital DX

Introduction:

Dynex Capital, Inc. is an internally managed mortgage real estate investment trust (REIT), which invests in residential and commercial mortgage securities on a leveraged basis. Their objective is to provide "attractive risk-adjusted returns to its shareholders over the long term that is reflective of a leveraged fixed income portfolio with a focus on capital preservation." Dynex Capital provides returns to its shareholders through quarterly dividends and through capital appreciation. It invests in Agency and non-Agency mortgage-backed securities (MBS). MBS consists of residential MBS (RMBS), commercial MBS (CMBS) and CMBS interest-only securities. Agency MBS have a guarantee of principal payment by an agency of the United States Government or a government-sponsored entity (GSE), such as Fannie Mae and Freddie Mac.

The United States Congress established REIT's in the 1960's to provide all investors with the same access to income-producing real estate that was typically available only to wealthy individuals. The National Association of Real Estate Investment Trusts (NAREIT), which formed that same year, keeps track of historical return data for the REIT sector since 1972. It has developed several indexes to track returns, led by the FTSE NAREIT All Equity REIT Index. This index contains all 12 equity REIT subsectors (it excludes mortgage REITs, which aren't classified in the real estate sector but are instead considered financial companies). Refer to figure 1.2 for reference.

Owning REITS can be a great alternative to owning hard assets like a rental property. With a REIT you don't worry about dealing with repairs or saving for a down payment, because it trades like a stock and you can invest in what you want. One of the bigger benefits of owning REITS is they are known for the high-yield dividends that they pay. Another reason for buying a REIT is actually to hedge against inflation, because the prices of real estate typically rise with inflation. They can also have a lower than average correlation with the stock market performance, so you can reduce the volatility of your portfolio by hedging your stocks against real estate. REITs can be a great investment vehicles over the long-term horizon, however dividends are considered passive income which can have a detrimental impact on your returns. There can be some small ways to get around this. I believe you are able to hold REITs in a registered account such as a Roth IRA and avoid paying some taxes. Roth IRA's can typically only contribute up to $6,000 per year.

Capital & Financing:

REITs typically will pay out almost all of their net income to the shareholders, this means they retain very little cash flows that they can put back into their business to invest for future growth projects or expansion. In order to be able to grow over time, REITs will raise capital in the form of debt and equity from its investors. If you are an owner of a REIT and that REIT raises new equity as capital, that actually means that your shares are going to be diluted.

Dynex Capital uses leverage to increase returns on their invested capital. The idea is they can earn a greater return on investments than the cost of borrowing. This can adversely affect their returns if borrowing costs increase and they have not adequately hedged against such an increase. Using leverage magnifies the potential losses to shareholders' equity and book value per common share if the market value of the investment declines.

Dynex Capital finances their investments principally with borrowings under repurchase agreements. Repurchase agreements generally have original terms to maturity of overnight to six months. Dynex may enter into longer-dated maturities depending on market conditions. They pay interest on the repurchase agreement at a rate based on a spread of short-term interest rates, and they pay a fixed rate for the term of the borrowing. Borrowings under uncommitted repurchase agreements are renewable at the discretion of the lenders and do not contain guaranteed roll-over terms.

Many of the repurchase agreements are uncommitted financings from lenders with an average term of less than 90 days. Because repurchase agreements are short-term financing commitments, changes in conditions in the repo markets may make it more difficult for them to secure continued financing, especially in time of high volatility. Regulatory capital requirements have changed significantly in recent years, and as a result, the cost of financing has increased and may continue to do so in the future.

Because Dynex relies heavily on borrowing under repurchase agreements to finance their investments, their ability to achieve profitability objectives can depend on their ability to access repurchase agreement financing in sufficient amounts and on favorable terms. If the terms on which they borrow change in a drastic way, or if borrowings are not available, they could be forced to sell assets, or their borrowing costs could increase which would reduce profitability and dividends to the shareholders.

Derivatives:

Dynex Capital uses interest rate swap agreements, futures, interest rate caps, options, forward contracts, and other derivatives to help mitigate increased financing costs and volatility in the market. Their hedging activity varies based on, things such as, the forecast of future interest rates, investment portfolio objectives, actual and implied levels of volatility in interest rates and more. There is no perfect hedging strategy that can completely protect them from interest rate risks to which they're exposed.

An interest rate swap is a contractual agreement between two parties in which each party agrees to make periodic interest payments to the other for an agreed upon period of time, based upon a notional amount. Dynex Capital utilizes pay-fixed interest rate swaps to hedge their interest rate risk. Under their pay-fixed interest rate swap agreements, Dynex pays a fixed interest rate and receives a floating interest rate based on one or three-month LIBOR. They sometimes do the opposite where they enter into a receive-fixed interest rate swap agreement. Interest rate swap agreements with a forward starting date do not have an exchange of these interest costs until the effective date of such agreement. Dynex Capital has at times entered into other derivative instruments including U.S. Treasury and Eurodollar futures contracts, options, and TBA short positions to help manage the adverse impact of interest rate changes on the market value of their portfolio as well as their net interest earnings.

TBA:

Dynex Capital invests in to-be-announced, or TBA securities and execute TBA dollar roll transactions. TBA dollar roll transactions delay the settlement of a forward purchase (or sale) of a TBA by entering into an offsetting TBA position. This is basically net settling the paired-off positions in cash, and simultaneously entering an identical TBA long (or short) position with a later settlement date. Market conditions could adversely impact the TBA dollar roll market and shift expectations. If that were to happen, it may be uneconomical to roll TBA positions prior to the settlement date, and therefore would have to take physical delivery of the underlying securities and settle their obligations for cash. In the case of a short position, they could be forced to deliver one of their Agency RMBS, which would mean using cash to pay-off any repo agreement amounts from that security. Dynex may not have enough funds for financing or sources available to settle such obligations.

LIBOR:

As of recently, LIBOR, which is deemed a benchmark reference rate, has been scheduled to be phased out at the end of 2021. In the United States, the Alternative Reference Rates Committee (ARRC), has proposed the Secured Overnight Financing Rate (SOFR), an index calculated by reference to short-term repurchase agreements backed by U.S. Treasury securities, as a preferred alternative rate for USD LIBOR. The change to SOFR or any benchmark rate, may cause that benchmark to perform differently than in the past. It will probably have consequences which cannot be predicted, such as financial market disruptions, significant increases in benchmark rates or short-term interest rates. Any of these could have a negative impact on their profitability. The transition to SOFR will require careful implementation so it doesn't disrupt the stability to the financial markets.

REITs:

There are two different types of REITs, there are equity REITs and mortgage REITs. Mortgage REITs raise both debt and equity through short term loans and issuing new shares to buy longer-term and high interest rate real estate debt and securities. Mortgage REITs usually don't own actual properties but just function as a type of private equity fund. They basically function as a less regulated riskier kind of bank. They generate cheap capital and then indirectly lend it out at higher interest rates by purchasing MBS.

Mortgage REITs need to take on higher leverage for them to hedge against a change in interest rates via derivatives such as interest rate swaps. A big issue that mortgage REITs are facing right now is the fall in mortgage rates. This is causing many homeowners to refinance their home and pay off their original mortgage. This is bad for mortgage REITs because they rely on the mortgage holder to pay off the loan over the full 15 or 30 years of the loan, so that the interest payments can amortize the premium they paid for the security. If the loan happens to get refinanced and it's paid off early this can hurt the book value of the company. The mortgage REIT model basically involves the REIT taking on short-term debt at a low interest rate, then buying mortgage at a higher interest rate and profiting from the margin.

The problem comes when interest rates eventually rise, which they will at some point. By then, the Fed will likely cut back on buying, and fewer people will be refinancing because rates are higher. Other investors aren't likely to be buying low-rate mortgages, either.

REITs Continued:

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Since the REITs use short-term debt, it has to be paid before the 15 or 30 year terms of the mortgage. This means they have to keep replacing their debt. As rates increase, they're paying more for the money they're using to hold onto their mortgages.

Rising rate aren't the only thing that is a threat to REITs. We're currently facing an economic crisis that we haven't seen before. What we faced in 2008 was a financial crisis and once everyone knew what was going on, they knew how to prepare for it. We haven't faced a global pandemic in over a hundred years, especially not with the economy that we currently have. Dynex and other REITs alike are significantly overleveraged and may not be prepared enough to endure a long economic downturn.

Conclusion:

Southwest uses a variety of different derivative instruments at different price points, but that leaves them at risk of fuel derivatives not providing enough protection against significant increases in fuel prices and in some cases could result in hedging losses. If Southwest is paying higher than market prices for fuel, they are creating additional volatility in their own earnings which reflects poorly on their financial statements. Southwest Airlines is a great example of how other transportation services can use futures, because in both cases the party would likely be covering a naturally short position. Southwest would buy crude oil contracts and take a long position in the futures market to hedge its naturally short position.

Dynex can be inconsistent and unpredictable relative to their dividend income, but they use their derivatives in efficient, yet complex way. Dynex Capital uses a form of hedge accounting that uses derivatives to hedge other underlying financial risks. It requires a level of expertise, but they use their agency MBS exposure in efficient ways. The business models of mortgage REITs range from investing only in Agency MBS to investing in non-investment grade MBS and securitizing mortgage loans. When purchasing investments and obtaining financing, Dynex Capital is able to compete with other mortgage REITs, broker-dealers, and investment banking firms, GSEs, mutual funds, banks, hedge funds, mortgage bankers, and insurance companies. Dynex Capital pays out 100% of its earnings but since they started paying a dividend in 2008, they have cut that dividend over 5 times since they've instituted one. This can be difficult for investors who are living off their income. It is tough to endure significant dividend cuts.

Tables

Figure 1.1

Period (by year)	Maximum fuel hedged as of December 31, 2019 (gallons in millions) (a)	Derivative underlying commodity type as of December 31, 2019
2020	1,301	WTI crude oil, Brent crude oil, and Heating oil
2021	1,169	WTI crude and Brent crude oil
2022	603	WTI crude and Brent crude oil
Beyond 2022	32	WTI crude oil

(a) Due to the types of derivatives utilized by the Company and different price levels of those contracts, these volumes represent the maximum economic hedge in place and may vary significantly as market prices fluctuate.

Consolidated Balance Sheet:

The following table presents the location of all assets and liabilities associated with the Company's derivative instruments within the Consolidated Balance Sheet:

		Asset derivatives		Liability derivatives	
(in millions)	Balance Sheet location	Fair value at 12/31/2019	Fair value at 12/31/2018	Fair value at 12/31/2019	Fair value at 12/31/2018
Derivatives designated as hedges (a)					
Fuel derivative contracts (gross)	Prepaid expenses and other current assets	$ 48	$ 43	$ —	$ —
Fuel derivative contracts (gross)	Other assets	62	95	—	—
Interest rate derivative contracts	Other assets	2	—	—	—
Interest rate derivative contracts	Accrued liabilities	—	—	5	2
Interest rate derivative contracts	Other noncurrent liabilities	—	—	1	12
Total derivatives designated as hedges		$ 112	$ 138	$ 6	$ 14

Tables

DX

Figure 1.2

Here is a look at how the index has performed versus the S&P 500

TIME PERIOD	S&P 500 (TOTAL ANNUAL RETURN)	FTSE NAREIT ALL EQUITY REITS (TOTAL ANNUAL RETURN)
1972-2019	12.1%	13.3%
The last 25 years	11.9%	12.6%
The last 20 years	7.7%	13.3%
The last 10 years	14.2%	13.2%
The last 5 years	12.5%	9.0%
The last year (2019)	31.5%	28.7%

Data source: NAREIT and Slickcharts.

Prior to the end of the first quarter of 2020, Dynex Capital primarily used interest rate swaps as economic hedges to mitigate declines in book value and to protect some portion of the company's earnings from rising interest rates. However, Dynex also reduced its notional balance of interest rate swaps late in the first quarter of 2020 due to the significant reduction of its MBS portfolio

	Three Months June 30,		Six Months Ended June 30,	
Type of Derivative Instrument	**2020**	**2019**	**2020**	**2019**
Interest rate swaps	$ (1,672)	$ (124,213)	$ (183,852)	$ (195,978)
Interest rate swaptions	—	—	(573)	—
Futures	(10,928)	(102)	(19,377)	(211)
Options on U.S. Treasury futures	(6,680)	—	(17,406)	—
TBA securities - long positions	8,688	6,780	27,119	16,956
TBA securities - short positions	2,029	—	(10,041)	—
Loss on derivative instruments, net	$ (8,563)	$ (117,535)	$ (204,130)	$ (179,233)

Type of Derivative Instrument	Balance Sheet Location	Purpose	June 30, 2020	December 31, 2019
Options on U.S. Treasury futures	Derivative assets	Economic hedging	$ 3,168	$ 2,883
Interest rate swaptions	Derivative assets	Economic hedging	—	573
TBA securities - long positions	Derivative assets	Investing	4,758	834
Total derivatives assets			$ 7,926	$ 4,290
U.S. Treasury futures	Derivative liabilities	Economic hedging	$ (4,208)	$ —
TBA securities - short positions	Derivative liabilities	Economic hedging	—	(974)
Total derivatives liabilities			$ (4,208)	$ (974)

The table below shows information about Dynex Capital's Interest rate swaps. They primarily utilize pay-fixed interest rate swaps to hedge their interest rate risk.

	June 30, 2020			December 31, 2019		
		Weighted-Average			Weighted-Average	
Years to Maturity:	Notional Amount	Pay Rate	Life Remaining (in Years)	Notional Amount	Pay Rate	Life Remaining (in Years)
< 3 years	$ 50,000	1.35 %	0.3	$ 2,860,000	1.58 %	1.5
>3 and < 6 years	—	— %	—	700,000	1.43 %	4.7
>6 and < 10 years	425,000	0.69 %	9.9	545,000	1.78 %	9.4
>10 years	—	— %	—	120,000	2.84 %	27.7
Total	$ 475,000	0.76 %	9.0	$ 4,225,000	1.62 %	3.8

The following table summarizes changes in Dynex Capital's derivative instruments. Dynex Capital's derivatives are subject underlying agreements which provide the right of offset in the event of default or bankruptcy of either party in the transactions.

Type of Derivative Instrument	Notional Amount as of December 31, 2019	Additions	Settlements, Terminations, or Pair-Offs	Notional Amount as of June 30, 2020
Interest rate swaps	$ 4,225,000	$ 2,915,000	$ (6,665,000)	$ 475,000
Interest rate swaptions	750,000	—	(750,000)	—
U.S. Treasury futures - short positions	—	2,212,600	(3,437,600)	(1,225,000)
Options on U.S. Treasury futures	1,350,000	3,425,000	(3,350,000)	1,425,000
TBA - long positions	435,000	5,311,000	(4,496,000)	1,250,000
TBA - short positions	500,000	3,017,000	(3,517,000)	—