THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF FINANCE

REVERSE MORTGAGES AND ALTERNATIVES: TURNING YOUR HOME INTO A LIQUID ASSET

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submitted in partial fulfillment
of the requirements
for baccalaureate degrees
in Finance and Economics
with honors in Finance

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ABSTRACT

This study focuses on examining the financial well-being of homeowners after they have taken out a Home Equity Conversion Mortgage, Home Equity Line of Credit, and Forward Mortgage; and comparing the results. The study used over 57,000 HECM's originated over the past year and used certain borrowing characteristics and assumptions to determine if a HELOC or Forward Mortgage would be a better option for the average HECM borrower. The study found that borrowers would be able to borrow $42,412.06 and 67,556.27 more, respectively, if they would take out a HELOC or Forward Mortgage.

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I would like to thank Lou Gattis for serving as my thesis supervisor and sparking my initial interest in this topic. I would also like to thank Brian Davis for serving as my faculty reader and honors advisor. Also, thank you to my parents for giving me the opportunity to attend Penn State and the Schreyer Honors College.

Chapter 1

Introduction

Reverse mortgages are unique financial products that have gained popularity since the financial and credit crisis in 2008. A reverse mortgage is an intricate tool with insurance-like qualities that is sold to individuals who wish to supplement their income with the equity of their residence. The most well known type of reverse mortgage is the Home Equity Conversion Mortgage, or HECM, and is backstopped by the Federal Housing Administration, or FHA. The FHA guarantees the performance of both the borrower and lender but the borrower pays a fee to ensure this. The borrower must pay a premium in addition to initial costs to initiate the transaction as well as another premium built into the monthly interest payments, which is discussed in further detail below.

The Home Equity Conversion Mortgage dates back to 1961 when the first reverse mortgage was issued by a loan company to a widow how had suddenly lost her husband and needed an additional source of income. Congress officially passed the first reverse mortgage pilot program called the Home Equity Conversion Mortgage Demonstration in 1987. In 2008, origination volume exceeded 100,000 for the first time in history and the Economic Housing Recovery Act placed limits on origination fees (Guerin 2012). In 2012, roughly 58,000 HECM loans (about 10%) were in default due to reasons such as unpaid taxes and insurance, which was a 2% increase from 10 years prior; this caused the FHA to realize $2.8 billion in losses. Due to these losses, new rules went into effect including a more stringent vetting process and a limit to how borrowers could draw down their money. Currently, borrowers can only draw down up to 60% of their credit line in the first 12 months following the origination of their HECM. A new assessment to ensure that the borrower can afford the insurance payments and taxes went into effect on April 27, 2015 (Loftsgordon 2015). According Harvard University's Joint Center for Housing Studies, the number of homeowners aged 65 and older is expected to grow from 26 million in 2010 to 35 million in 2020, and

to 45 million in 2030. This 73% increase in elderly homeowners will also likely lead to an increased number of individuals looking to tap into their homes equity for additional income. These individuals will likely turn to HECM's for this income but could potentially benefit from turning to alternatives.

A HECM is only one of numerous financial tools available to consumers if they want to receive income from the equity in their home. For instance, a consumer could choose to take out a traditional forward mortgage against their home. Another possibility for the homeowner could be to take out a home equity line of credit, or HELOC, and access the funds as necessary. According to the U.S. Department of Housing and Urban Development, roughly 75% of those who utilize reverse mortgages choose a line of credit rather than monthly payments, which renders a HECM very similar to a HELOC (USHMC 2008). Consumers may choose to go the way of a HELOCs or forward mortgages because the funds available are larger and the transaction costs are usually lower. However, the major differentiating factor for the HECM is that it the borrower is not required to pay interest nor is any payment due until the borrowers death. Therefore, some consumers may opt for the larger sums of the HELOC or forward mortgage or may choose a HECM to avoid monthly costs.

Chapter 2

Overview of Reverse Mortgages

In its simplest form, a reverse mortgage is a loan secured by the borrowers primary home, much like a forward mortgage or more equity line of credit. Elderly homeowners are drawn to reverse mortgages for its two advantages over HELOCs and forward mortgages. The first is that a reverse mortgage does not require the borrowers to make monthly interest payments in accordance with the repayment of the loan. This is very attractive for elderly borrowers as most are on fixed incomes and can't afford to make to monthly payments. The second advantage of reverse mortgages is that payment on the loan is not due until the borrower's death, in which payment is made to the loan originator by taking ownership of the borrower's home. This is attractive to many elderly borrowers, as some have no need for their homes after their death. The HECM represented the majority of all reverse mortgages according prior to the financial crisis but nearly all of those alternatives are no longer available post-crisis (AARP 2010).

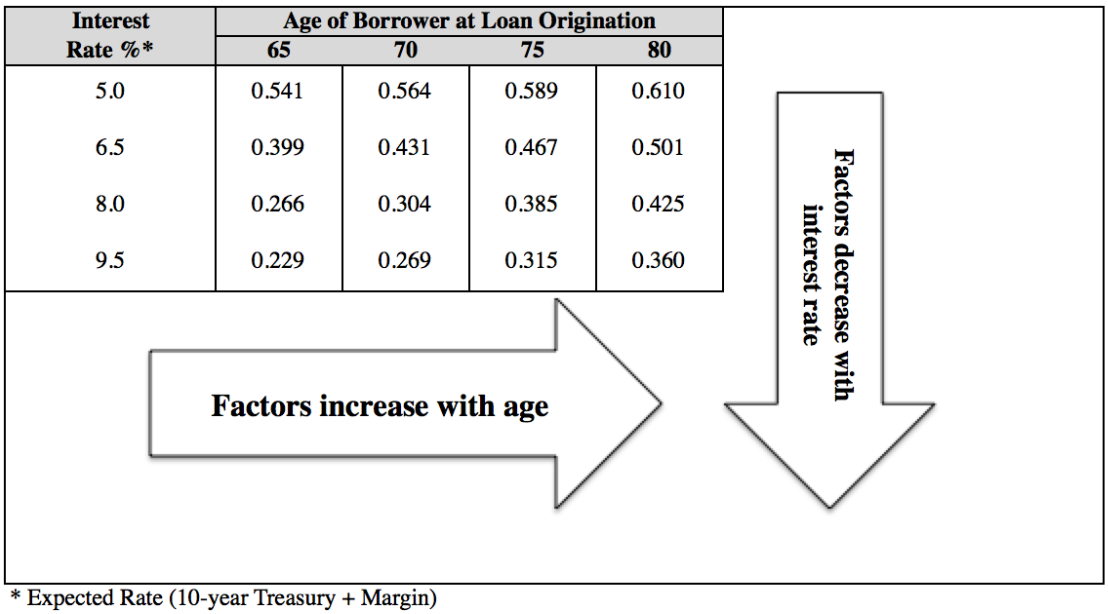
There are several borrower requirements that consumers must meet in order to be deemed eligible for HECMs. The borrower must be 62 years or older, occupy the home as a primary residence, and own the home outright or have significant equity in the home. The borrowers must also meet various financial requirements including; verification of income, assets, and credit history as well as timely payment of real estate taxes. The amount available to the borrower is based on three criteria; the age of the youngest borrower or eligible non-borrowing spouse, the current market interest rate, and the lesser of the appraised, fair market value of the home or HECM mortgage limit, which is currently set at $625,000.

The amount of credit available to borrowers is known as the principal limit and is a percentage of the homes value or the limit of $625,000. To get the principal limit, issuers multiply the home's value by the principal limit factor. The principal limit factor (PLF) is based on both the age of the borrower and the

interest rate. PLF's are set values and are determined by the Department of Housing and Urban Development. Examples of the current Principal Limit Factors can be seen in Figure 1.

Figure 1. HECM Principal Limit Factors (for Selected Ages and Interest Rates)

Interest Rate %*	Age of Borrower at Loan Origination			
	65	70	75	80
5.0	0.541	0.564	0.589	0.610
6.5	0.399	0.431	0.467	0.501
8.0	0.266	0.304	0.385	0.425
9.5	0.229	0.269	0.315	0.360



* Expected Rate (10-year Treasury + Margin)
Source: Offical HUD PLF's effective Aug, 2014

Example: A 70 year-old borrower with a home value of $500,000 can borrow a maximum lump sum line of credit of $500,000 x 0.564 = $282,000, less closing costs and origination fees, assuming a 5% interest rate.

Including a lump sum line of credit, borrowers can select 5 of the following plans:

(1) Tenure: This provides equal monthly payments as long as one of the borrowers lives and continues to occupy the residence.

(2) Term: This provides equal, fixed monthly payments for a pre-specified term

(3) Line of Credit: This provides unscheduled payments at times and in amounts of the borrowers choosing until the line of credit is drawn down.

(4) Modified Tenure: This includes a combination of a line of credit and scheduled monthly payments as long as the borrower occupies the home.

(5) Modified Term: This includes a combination of a line of credit and monthly payments for a fixed period of the borrowers choosing.

* The borrower can change the payment plan of their reverse mortgage for a fee of $20 (MetLife 2013).

The adjustable-rate for HECM's are indexed to either the 10-year Treasury or the 10-year LIBOR as the index. The lender then charges a margin in addition to the index rate. This rate is determined by a multitude of factors and fluctuates from week to week, however, once the rate is set for the loan, it is set for the entirety of the loan.

There are also several costs associated with HECMs:

(1) Mortgage Insurance Premium (MIP): Borrowers incur costs associated with their HECM being insured by the FHA. This insurance guarantees the expected future loan advances and the costs are financed as part of the loan. The initial MIP is 0.5% or 2.5% depending on the selected method of disbursement and over the life of the loan the borrower is charged 1.5% annually.

(2) Third Party Charges: The borrower may incur third party closing costs including, but not limited to appraisals, title searches, surveys, and credit checks.

(3) Origination Fees: Borrowers are required to pay origination fees to compensate originators for processing the loans. The originator can charge the greater of $2,500 or 2% of the first $200,000 of your home's value plus 1% of the amount over $200,000. Origination fees are capped at $6,500.

(4) Servicing Fee: Originators provide servicing throughout the life of the loan including, sending the borrower account statements, disbursing loan proceeds and making certain that the borrower keeps up with loan requirements such as paying real estate taxes and hazard

insurance premium. Originators may charge a monthly servicing fee of no more than $30 if the loan has an annually adjusting interest rate or has a fixed interest rate. The Originator may charge a monthly servicing fee of no more than $35 if the interest rate adjusts monthly. The Originator sets aside the servicing fee and deducts the fee from your available funds at the closing of the loan and each month the monthly servicing fee is added to the borrowers loan balance. Originators also have the option to include the servicing fee in the mortgage interest rate (USHUD).

Chapter 3

Overview of Home Equity Lines of Credit and Forward Mortgages

Home Equity Lines of Credit, or HELOCs, and forward mortgages are structured differently than HECMs but might be advantageous to borrowers given the right circumstances. A forward mortgage is a typical fix-rate mortgage which can be thought of as a cash-out refinance. The mortgage replaces any current mortgage and also uses the equity in your home to provide the borrower with cash. It is different than a HELOC because it allows consumers to borrower a larger percentage of their homes value and also acts as a lien on the home like a traditional mortgage. Both products require monthly amortizing payments to pay down the loan, which deter many senior borrowers as the payments would be a large burden to the low-income retired community. Due to the requirement of monthly payments, there are also more stringent lending standards that borrowers need to abide by. Some borrowers with a fixed monthly income may not even be able to quality however; a person with substantial retirement savings via a 401k or savings may be able to qualify for a HELOC or Forward mortgage. If they do in fact have the financial resources to qualify, it begs the question, why do they need the benefits of the loan in the first place?

One possible scenario in which a forward mortgage would be advantageous for a borrower is if a homeowner has significant financial assets but needs a relatively large amount of cash in a short period of time because qualified borrowers can borrow a larger percentage of their home's value and pay significantly less closing costs compared to a HECM. A HELOC may be a better alternative to a HECM than a forward mortgage because HELOCs are predominately set up to require monthly interest payments only. Like forward mortgages, HELOCs have low transaction costs and can allow borrowers to access a larger portion of their homes value. The one caveat to HELOCs is that the homeowner can only borrow up to 70% of their home's value, whereas with a forward mortgage, borrowers can borrow 80%.

Chapter 4

Literature Review

The question of whether or not to take on a reverse mortgage has been a widely debated topic ever since its creation in the 1960's. Some critics argue that reverse mortgages are simply designed to take advantage of uninformed consumer while others state that they are a necessity for those who lack the liquidity they desire to enjoy their retirement. There are many factors that go into making this decision and consumers often do not make the decision, given their financial situation. There have been a number of different papers published that have related to this topic.

In "Reverse Mortgage Loans: A Quantitative Analysis," Irina Telyukoya and Makoto Nakajima discuss the history of reverse mortgages; focusing on the more popular, government sponsored Home Equity Conversion (HECM) loans. They state that these government subsidized and insured loans are the best option for the elderly, many of whom are in desperate need for cash but question the long term viability. They suggest that with government programs being cut and altered every year, they don't think that it's a good idea to have to rely on these subsidies. Their stance on the viability of the programs illustrates the need for viable alternatives but they do not explicitly suggest any.

The large demand for reverse mortgages and alternatives is supported in the works of Gary Engelhardt and Christopher Mayer. In "Intergenerational transfers, borrowing constraints, and saving behavior: evidence from the housing market," the authors examine the supply of elderly wishing to take out reverse mortgages and how it impacts the housing market as a whole. They argue that the amount of elderly eligible for reverse mortgages are growing at a steady rate ensuring the long term demand for financial solutions such as a reverse mortgage. According to the authors, the demand for reverse

mortgages will continue to grow but the uncertain sustainability of the government HECM loans means that there needs to be another solution that produces the same desired results. This research proves that in the future there is a viable need for reverse mortgages and more importantly, potential alternatives.

In "Aging and the Income Value of Housing Wealth," Steven Venti and David Wise state that the majority of those taking out reverse mortgages are very old and have very little equity in their homes. They argue that an annuity of payments on that small value is not beneficial and that a lump sum payment would be more beneficial to them, which reverse mortgages do not provide. Like many other authors, Venti and Wise argue that potential alternatives would provide more help to those who need it. They state that for the alternatives to truly be effective they should provide a one-time lump sum cash payment for the equity on the home and they should also not be as restrictive as the typical reverse mortgage. This provides more flexibility for the borrower, as they are already fiscally restricted.

Andrew Caplin introduced some of the problems with reverse mortgages and attempted to explain the gap between the current reverse mortgage market and it's theoretical potential. In "The Reverse Mortgage Market: Problems and Prospects," Caplin argues there are psychological forces that could possibly explain why there is a lack of enthusiasm amongst the elderly regarding reverse mortgages. He argues that older generations have a stigma of taking on too much debt and they are especially reluctant, having to already pay off their first mortgage. Also, Caplin states that older generations are inherently not very trusting to things that are new to them. At the end of his paper, he makes the conjecture that reverse mortgages do serve an important task but it's not to fund day-to-day consumption like it was intended. Caplin suggests that reverse mortgages could be useful in funding emergency situation for example, if a spouse becomes sick and has to be placed into an assisted living facility. The question that remains is if there was some sort of financial product or combination of products that could be viable for both emergency situations, but also day-to-day consumption. That being said, the issue of breaking the psychological barrier that the elderly have against borrowing still persists.

In “Reversing the Trend: The Recent Expansion of the Reverse Mortgage Market,” Hui Shan examines the resurgence of reverse mortgages in the mid-2000’s and attempts to explain the causes. His main conjecture is that the rising home prices during the housing boom in the 2000’s are what caused the increase in reverse mortgage origination. He goes on to state that the increased value of the homes used as collateral for the reverse mortgages led to more favorable terms for the borrower, spurring growth in the market. According to Shan, the future appreciation or depreciation of the housing market should be a factor in examining the future viability of reverse mortgages or any alternatives.

In “Mortality, Move-out and Refinancing as Factors in HECM Reverse Mortgage Payoffs,” Richard McConaghy compared the characteristics between HECM borrowers and non-HECM elderly borrowers. To do this, he used HECM data for a 10-year period beginning at 1989 and compared the borrowing characteristics, as well as the repayment patterns, and researched the feasibility of refinancing their existing obligations with HECM’s. McConaghy’s finding were very surprising in that over 50% of the test subjects would have increased borrowing amounts if they refinanced their home with a HECM. He also found that while their borrowing amount may have increased, the subjects were left with lower levels equity in their home and larger transaction costs related to the HECM. Another interesting finding of the author’s is that borrowers who used HECM’s repaid their obligations quicker then their non-HECM counterparts and over 60% of HECM borrowers repaid their obligations in less than 10 years.

Chapter 5

Data and Analysis

For the initial data used to compare the HECM and its counterparts, I utilized HECM data from the Department of Housing and Urban Development's (HUD) Office of Evaluation. Every month, the HUD generates a report of every HECM originated by accredited lenders. They provide the ZIP Code, Sponsor State, Interest Rate, Home Value, and Initial Principal Limit of every HECM loan originated in that month. More specifically I used the past HECM report from September 2014 through August 2015, which was the most recent month. These report included data from 57,077 HECM's and the averages of their Interest Rate, Home Value (Maximum Claim Amount), and the Initial Principal Limit (amount of credit available) can be seen below in Figure 2:

Figure 2. HUD HECM Data from September 2014 – August 2015

Month	Number of Observations	Average Interest Rate	Maximum Claim Amount	Initial Principal Limit	Implied PLF
Sep-14	3762	3.19	$255,818.18	$145,851.64	0.570
Oct-14	4851	3.21	263,829.15	154,616.62	0.586
Nov-14	4407	3.19	273,105.92	160,908.79	0.589
Dec-14	4940	3.20	266,899.03	157,200.10	0.589
Jan-15	4936	3.22	273,490.94	162,205.58	0.593
Feb-15	4716	3.23	277,244.84	164,765.53	0.594
Mar-15	4634	3.28	271,506.78	161,320.59	0.594
Apr-15	4492	3.31	273,950.04	162,968.55	0.595
May-15	4270	3.35	274,273.76	162,902.65	0.594
Jun-15	5295	3.37	277,511.09	164,813.91	0.594
Jul-15	5025	3.42	278,527.33	165,199.01	0.593
Aug-15	5749	3.45	307,412.23	182,956.46	0.595

After taking these averages, I calculated the closing costs and origination fees associated with a HECM of this amount:

HECM Initial Fees	
Closing Costs	$2,744.64
Origination Fee	$4,744.64
MIP	$6,861.60
Total	**$14,350.88**

The closing costs were set at 1% of the Maximum Claim Amount which is an assumption that had to be made given variability of costs from bank to bank. The Origination fee was calculated by using the FHA standard formula of 2% for the first $200,000 of the Maximum Claim Amount and 1% for any amount thereafter. The Mortgage Insurance Premium is also a FHA standard and is set at 2.5% of the Maximum Claim Amount.

I then applied the average home value of $307,412.23 from the HECM data to calculate the loan amounts, monthly payments, and initial fees of a HELOC and Forward Mortgage:

HELOC		**Forward Mortgage**	
Home Value	$274,464.11	Home Value	$274,464.11
Loan Amount @ 70% Home Value	192,124.88	Loan Amount @ 80% Home Value	219,571.29
Monthly Drawdown Payment*	562.69	Monthly Payment*	1,018.00
*Assumes an average market interest rate of 3.55%		*Assumes an average market interest rate of 3.76%	

The monthly payments were calculated using the following formulas:

$$\textit{Monthly Drawdown Payment} = P\,(i/12)$$

$$\textit{Monthly Payment} = P\,[(i/12)(1+i)^{n}] \,/\, [(1+i)^{n-1}]$$

HELOC Initial Fees		Forward Mortgage Initial Fees	
Closing Costs	$0	Closing Costs*	$2,027.74
Origination Fee @ 1% of loan	1,921.25	Origination Fee @ 1% of loan	2,195.71
Total	**$1,921.25**	**Total**	**$4,223.45**

*Source: June 2015 Bankrate.com survey found national average costs of 0.923%

Figure 3. Summary of Loan Outputs

Category	HECM	HELOC	Forward
Maximum funds	$162,142.45	$192,124.88	$219,571.29
Less total costs	14,350.88	1,921.25	4,223.45
Net Funds	147,791.57	190,203.63	215,347.83
Monthly Payment	232.68*	562.69	1,018.00
Interest Rate	3.28%	3.55%	3.76%

* Monthly HECM fee includes $30 monthly maintenance fee and 1.5% yearly MIP fee

Figure 4. Credit Line: Break-even Analysis

Category	HECM	HELOC	Forward
Net Funds	$147,791.57	$190,203.63	$215,347.83
Funds in excess of HECM	-	42,412.06	67,556.27
Monthly Payment	232.68	562.69	1,018.00
Months until break-even*		75.37	66.36
Years until break-even*		6.28	5.53

* Break-even terms were calculated assuming the excess funds are used to make monthly payments

The data shows that the HELOC and Forward Mortgage give the borrower significantly larger amounts in which they can borrow. While they do have larger monthly payments, the excess funds can be used to make those payments for 75 and 66 months, respectively. This evidence along with McConaghy's conjecture that the majority of HECM borrowers keep their HECM's for less than 10 years, supports the position that for the majority a HELOC or Forward mortgage are superior to HECMs. Also, if the borrowers are looking to use the funds quickly and not spread out over the length of their retirement, they would be better served with a HELOC or Forward mortgage because HECM bowers can't use more than 60% of their available funds in the first 12 months after closing. However, that the main drawback to these two financial products is the stringent financial requirements to qualify. Banks evaluate the borrowers income and apply this to high standards, which could lead to retired borrowers paying more for a HELOC or Forward, or they may not even be able to qualify at all. To circumvent this problem, borrowers could simply take out the loans in the last year or two of working full time. The increased cash flows and income will not only easily allow them to qualify or the loans, they could also lock in a lower, fixed interest rate that will serve them for the life of the loan and reduce their monthly payments.

While this data suggest that a HELOC or Forward is always superior to a HECM, there are strengths associated with a HECM and situations where it would be the better option for borrowers. For example, an HECM has less strict qualifying conditions, which make it easier for retired borrowers on a fixed income to qualify. Even if a HELOC or Forward would be better for a borrower, they may not be able to qualify but would still be able to purchase a HECM. Another significant strength of HECMs is the non-recourse loan. This means that if the HECM loan balance grows larger than the value of the home, the FHA guarantees that if you or your family want to repurchase your home back from the bank, you can do so by only paying the current appraised value. This is a great form of insurance against devaluation in home prices as seen in the latest recession. The last important strength of a HECM is that its structure is set up to act as a long-life insurance policy. If the borrower chooses to have the HECM paid out in either tenure or modified-tenure formats, they are guaranteed monthly payments as long as they live and occupy

their home. The longer the life of the borrower equates to a larger payout meaning that borrowers who think that they will live long enough and not move into assisted living care can maximize the amount of equity they can extract from their home by utilizing a HECM.

Chapter 6

Conclusion

As previously mentioned, reverse mortgages have gained popularity since the recession in 2008 as more seniors look to supplement their fixed income by tapping into the equity of their home. While I was successful in my mission to compare the popular HECM to viable alternatives, there were several flaws in my methodology and wide-ranging assumptions I had to make. The data set provided by the HUD did not include some important borrower characteristics, mainly age. This precluded me from accurately calculating the particulars of the HECM and Forward mortgages. Also, many of the expectations I had regarding the HECM and Forward mortgages involved assuming that the borrowers had a stable job and an excellent credit score.

While there were key assumptions that had to be made assuming the bower characteristics, I was able to show that given the average home value of HECM borrowers, those borrowers would be better off by utilizing either a HELOC or Forward Mortgage. Borrowers would be able to borrow $42,412.06 and 67,556.27 more, respectively and could use those excess funds to pay for their monthly fees for 72 and 65 months. While this is a wide-reaching hope, I believe that the information and analysis done in this paper could be used to educate those interested in borrowing so they are able to make a more informed decision as consumers.

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EDUCATION

The Pennsylvania State University — **University Park, PA**
Schreyer Honors College — *Class of December 2015*
Smeal College of Business: Bachelor of Science in Finance
College of Liberal Arts: Bachelor of Science in Economics

- **Recognitions:** Beta Gamma Sigma, Merrill Lynch Outstanding Student Award, President's Freshman Award

CEPA Europe
Exchange Student — *Spring 2012*

- Traveled to France, Germany, and Switzerland
- Studied management techniques within European companies and compared these to domestic practices

RELEVANT EXPERIENCE

Morgan Stanley — **New York, NY**
Credit Risk Summer Analyst — *June 2015 – August 2015*

- Worked with investment banking and capital markets to provide credit analysis and research to the capital committee in connection with the underwriting of term loans, bridge loans and other credit facilities for LBOs, M&A activity, dividend recapitalizations and relationship lending
- Monitored a portfolio of high yield counterparties in the technology, media & telecommunications industries by tracking performance as well as any changes to business strategy or capital structure
- Assessed the creditworthiness of counterparties in conjunction with the firm's warehouse lending platform
- Gained exposure across the full spectrum of ABS assets, including: mortgages, equipment leases, auto loans, student loans, marketplace lending, and solar receivables
- Authored credit reviews & present credit opinions to senior credit professionals

Mackenzie Capital — **Baltimore, MD**
Summer Analyst — *June 2014 – August 2014*

- Constructed discounted cash flow models on commercial real estate portfolios, using ARGUS and Microsoft Excel, to identify the appropriateness of liquidation
- Performed due diligence to assist commercial real estate clients with debt and equity placement needs
- Conducted real estate capital markets research and prepared reports for senior management
- Designed and maintained a database to help senior management strategically identify prospective clients and financial purchasers more efficiently

Wall Street Boot Camp — **University Park, PA**
Intern — *January 2013 – May 2015*

- Monitored each participants progress by keeping thorough records of assignments, attendance, and participation
- Served as a liaison between the program's director and participants to communicate upcoming events and meetings

Wall Street Boot Camp — **University Park, PA**
Participant — *August 2013 – December 2013*

- Selected as one of 40 students from over 300 applicants to participate in an educational program focusing on preparation for careers in the financial services industry
- Attended sessions throughout an entire semester, which were presented by Wall Street professionals on topics such as Investment Banking, Sales and Trading, and Private Equity

Penn State Investment Association — **University Park, PA**
Healthcare Sector Analyst — *Fall 2013 – Present*

- Provided supporting research and analysis of company and stock performance to assist in buy/hold/sell decisions for the Nittany Lion Fund, a $7 million portfolio of alumni investments, which are managed by students
- Attended sessions on financial modeling, valuation, FactSet, and Bloomberg
- Placed first in Stock Pitch Competition after pitching Wynn Resorts

TRAINING AND INTERESTS

Training: Advancing through the Operating Model, Merger Model, DCF Model, and LBO Model instruction seminars as part of *Breaking into Wall Street* self-study course

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