Investing in Online Peer to Peer Loans: A Platform for Alpha

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Peer to peer (P2P) lending is an emerging asset class that potentially offers investors relatively high risk adjusted returns and a good way to diversify portfolios. However, little research has empirically explored the returns of P2P loans. This study explores the investment returns of P2P loans and the impact of P2P loans on investment portfolios. We draw data from the leading P2P lending platform, Lending Club, and compare the 2007-2014 investment returns from Lending Club to other assets and look at how P2P loans affect the efficiency of portfolios. The results suggest that P2P loans offer relatively high risk adjusted returns that can improve the efficiency of investment portfolios and can help investors achieve alpha.

INTRODUCTION

Financial technology (fintech) is starting to disrupt the world of investing, and it appears that fintech could offer a means to help investors increase the efficiency of their portfolios. One type of fintech that has the potential to aid in this is online peer-to-peer (P2P) loans. Through online platforms, borrowers and lenders connect without the mediation of financial institutions. With P2P lending, borrowers describe the purpose of their loan request and provide their current financial information, such as credit score and open credit lines. This information is disguised and presented anonymously to lenders, and then the lenders decide whether to invest in fractions of the loans. The lenders' impetus to loan money is the interest that is offered on the loans. This interest is determined by the overall credit worthiness of the borrower. Most platforms have grades that offer interest from as little as 5% to as high as 36%. The platforms serve as the intermediary and take between 0.5%-1% of the loan payments as a service charge (Galloway, 2009).

This type of lending dates back to 2004 in the United Kingdom and late 2006 in the United States. In the UK, P2P lending took off with 2005. Between 2006 and 2008 P2P lending grew steadily in the US, but it hit a snag in 2008 when the SEC determined that these loans should be classified as securities and, thus, regulated. This led the major platforms to put new loans on hold until they properly registered with the SEC. Both organizations survived the reclassification and moved back onto a path of steady growth.

In 2015 US P2P lending grew to $6 Billion (PWC, 2015). Personal P2P loans range from $1,000 to $40,000, and the average loan size in 2014 was approximately $14,000.

The demand for personal loans is enormous. In 2015 there was over $885 billion of revolving credit available to personal borrowers in the US (Clements, 2015). Although there is a large amount of revolving credit outstanding, personal lending markets have been tight; the personal lending markets tightened during 2008 financial crisis and have not loosened up since (Brown et al., 2010). Deutsche Bank estimates that in 2013 that over 48 million borrowers in the US with credit scores above 650 have struggled to obtain personal financing. It has been even harder for small businesses to obtain loans; Tsuruta (2015) estimates that the acceptance rate of small business loans under $35,000 is less than 50%. Thus it appears that there is great potential for P2P lending to continue to grow. This is further backed by Price Waterhouse Coopers who suggests that P2P lending will grow to over $150 billion by 2025 (PWC, 2015).

At the same time the demand for small loans is growing, the supply of capital for these loans is growing. This is largely because it is becoming easier for individuals and companies to invest in P2P loans. The SEC regulates the industry and individuals can use retirement accounts to invest in loans. Individuals can invest in the loans directly on the lending platforms, or they can use a third party to choose the investments for them, and recently robotic platforms have emerged that use big data to analyze the data supplied by the borrowers to automatically construct portfolios that maximize risk-adjusted returns. The other big benefit of the robotic P2P investment platforms is that the investors do not have to spend a lot of time choosing loans; instead, they spend a few minutes entering their investment objectives, and then the robotic platforms choose the loans according to those objectives. Another reason P2P lending has become more popular amongst investors is the recent emergence of secondary markets where investors can sell individual notes or portfolio of notes. Early on one of the negatives of P2P lending to investors was the investments were relatively illiquid. Investors had to put money in notes that where principal and interest were earned back over a three to five year period. Now, because of the secondary markets, investors can liquidate their notes if need be. There are several well-established secondary markets for P2P notes, and there are new technologies that make it easier to invest in secondary notes. For example, FolioFn is a platform for pricing secondary portfolios that enables even novice investors to invest in P2P secondary notes.

Although P2P lending demonstrates the characteristics of an asset class, it has not been examined from a Modern Portfolio Theory perspective. Modern Portfolio Theory origins can be traced to Harry Markowitz's seminal work in the 1950s (Markowitz, 1952). Through his findings, and those of William Sharpe (Sharpe, 1963; 1964), it was concluded that an assets individual volatility does not matter, but instead the volatility it adds to a well-diversified portfolio given its level of return. This simplified the process under which asset performance was measured. By making some generally accepted assumptions, all calculations filtered down to an assets covariance with a portfolio, and later, the market portfolio that all rational investors hold in different amounts. Therefore, the investor searches for new investments to add to the portfolio that will either maximize their expected return while maintaining a level of risk, or minimize their risk by maintaining a level of expected return.

P2P lending, as will be demonstrated shortly, is an asset class that has promising attributes for investors, especially during times of market turmoil when most traditional asset classes become highly positively correlated. Strong positive correlation is the antithesis of Modern Portfolio Theory. New research has emerged emphasizing the importance of new assets and asset classes required in a portfolio so that the tenets of modern portfolio theory continue to hold. Seiler et al. (1999) demonstrate what is commonly employed; real estate deserves to be its own asset class for portfolio diversification. While it is now commonplace, it was not always the case. Traditional portfolios simply had equity and fixed-income components. Furthermore, Finkenzeller et al. (2010) conclude that infrastructure, separately from real estate, should be its own asset class from an investment perspective. Becker (2011) makes the argument that microfinance investments, banking services offered to individuals who usually lack access to financial services, should also be included in any asset allocation.

This is one of the first studies to examine P2P lending as a unique asset class. Below we discuss the methods and results. Followed by this, we offer ideas on P2P lending can be further explored under the lens of modern portfolio theory.

METHODS AND RESULTS

In order to look at the returns and volatility of P2P lending, we first looked at the performance of a typical investment portfolio (benchmark portfolio) without the inclusion of P2P from 2005-2014. Although this is a relatively short period of time, it is a time that demonstrated many different extremes, and therefore provides good insights on portfolio returns. The benchmark portfolio is the 'All Century Portfolio', a traditional 60% equity and 40% fixed-income portfolio. Each investment in the portfolio is represented by an ETF (exchange-traded find) or Index Fund. The 60% equity portion is made up of 20% in the Vanguard Total Stock Market Fund (US Stocks), 15% in the Vanguard Pacific Stock Index Fund (Pacific Stocks), 15% in the Vanguard European Stock Index Fund (European Stocks), 5% in the Vanguard Small-Cap Value Fund (US Small Cap Value Stocks), and 5% in the Vanguard REIT Fund (US Real Estate). The 40% fixed-income portion is made up of 20% in the iShares Barclays Aggregate Bond Fund (US Bonds), 10% in the iShares TIPS Bond Fund (US TIPS), and 10% in the Vanguard High Yield Corporate Fund (US High Yield Corporate Bonds). Monthly returns are obtained from Yahoo! Finance, and these returns are calculated using the adjusted closing prices which factor in splits and dividends. Fees are not deducted, reason being explained shortly. The monthly returns for the portfolio are calculated by taking the weighted average of the returns based on the portfolio weightings and the individual investment performance. Therefore, there are 120 data points for each investment.

Table I summarizes the return and volatility of each investment along with that of the entire portfolio. The portfolio's annual return is 7% with a standard deviation of 40%. While the volatility is relatively high when compared to the annual returns than is expected a priori (.17 return to risk ratio using our data versus closer to .5 in the literature), it should be noted that this time period included the second worst year in stock market history. The performance of each component of the portfolio varied significantly. VNQ had the highest annual return of 12.12% per year, but had a volatility of 1.056. Conversely, AGG had only had annual returns of 4.71%, but also only had a volatility of .1222. Overall, the portfolios returns were in line with what would be expected of a typical portfolio of its makeup.

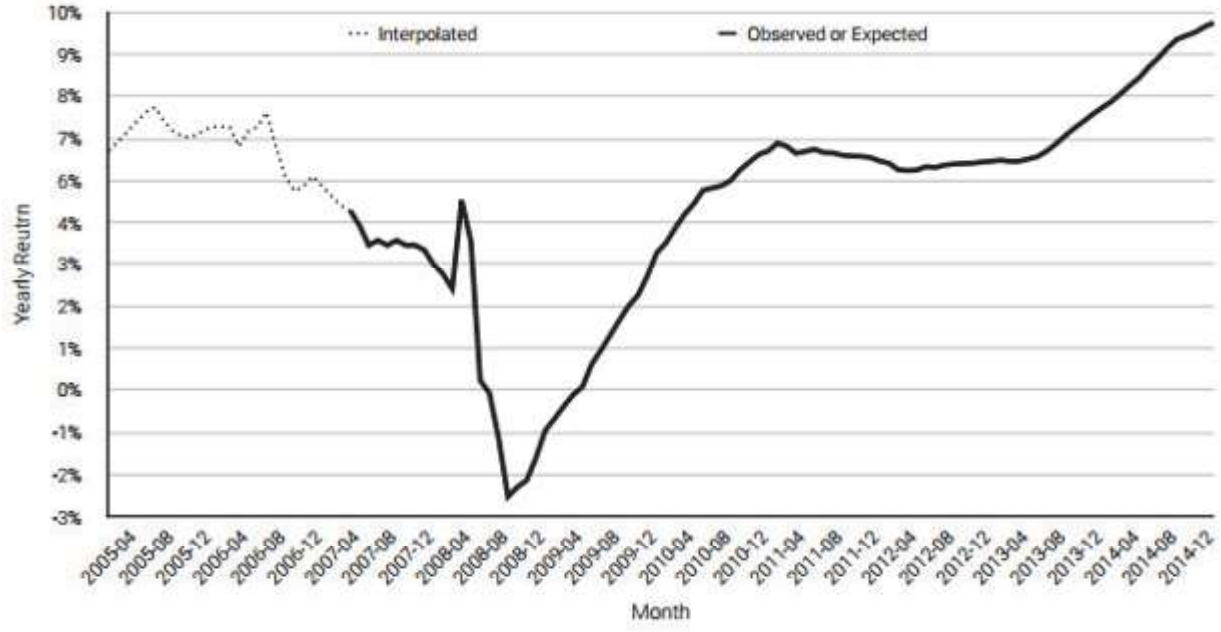
Table 1. Return and Volatility of Each Asset

Asset	Annual Return	Volatility	Return-to-risk ratio
VTI	0.095427427	0.602906421	0.158279004
VPACX	0.059064428	0.664132637	0.088934687
VEURX	0.065720626	0.809129068	0.081223909
VBR	0.106762855	0.82617905	0.129224839
VNQ	0.121924611	1.056661811	0.115386597
AGG	0.047148207	0.122263593	0.385627522
TIP	0.044843749	0.189159592	0.237068332
VWEHX	0.070571750	0.342446593	0.206081041
Initial Portfolio	**0.069988096**	**0.403880638**	**0.17328906**

While the composition of the benchmark portfolio is straight-forward and similar portfolios have been exhaustively used for comparative purposes (e.g., Cuthbertson et al., 2010; Choueifaty et al, 2013), almost no research has how the inclusion of P2P loans could affect portfolios. The lack of research on the topic is attributed to the newness of P2P and the fact that the addition of an index representing marketplace lending has some obstacles. First, as the proxy, we use data from Lending Club, a consumer credit organization platform and the largest marketplace lending platform with a valuation of over $8 billion at the end of 2014. One benefit of using Lending Club as a proxy is their data transparency. Second, Lending Club began issuing loans in July 2007. For that reason, data is extrapolated for the months before July 2007 (30 out of the 120 months). The process for extrapolation will be discussed shortly. Third, most of the Lending Club loans have not matured yet. The process for incorporating this will also be discussed below.

To extrapolate the returns from the beginning of 2005 to June 2007, we recreate the returns as follows. Expected returns are generated through the interest rates on the loans and the probabilities that the payments are made. Preliminary empirical testing demonstrated that the lifetime distribution function is constant over the probability of default, and that the highest probability of default occurs at one-third of the maturity, regardless of the a priori risk level of the loan. Therefore, to extrapolate the default rates for this index, we co-integrate the Lending Club data with historical data using a multivariate regression fitting our data to the Experian Consumer Credit Default index. This maintains the covariation in our data while including expected returns from 2005 to mid-2007 with changes in realistic default rates. The R-Squared is 0.86. Using these extrapolated default rates along with the average interest rate, we create the missing data for comparison with the traditional investments. Figure 1 presents the yearly returns from 2005-2015.

Figure 1. P2P Lending Returns



As expected and is common for fixed-income securities, the returns are less volatile than equities using our sample; they are also less volatile than the traditional fixed-income investments. One caveat is that our returns are net of fees whereas the traditional portfolio is gross of fees. We do this to 'penalize' the market based lending for its lack of and substantially less liquidity when compared to the traditional asset classes.

Table 2 summarizes the return and volatility of this market based lending index in comparison to the benchmark portfolio. The returns are slightly lower, but more importantly, the volatility is substantially lower than the traditional portfolio. This leads to a return to risk ratio of 1.91, over 11 times that of the traditional portfolio. During the same time period, aggregate P2P loans had average annual returns of about 5.18% a year and had a very low volatility factor of .0275. Although the returns of the P2P portfolio were slightly below the benchmark portfolio, the risk adjusted returns were better than the benchmark portfolios. Furthermore, and as Table 3 shows, P2P lending is not highly correlated with the rest of the portfolio; in fact, its correlations are substantially lower than any other assets in the portfolio are. Modern portfolio theory states that an assets individual return and volatility is not important (Markowitz, 1952), but instead what is important are its addition in terms of return and reduction in terms of volatility to a well-diversified portfolio. It appears, at least on the surface level, that P2P assets have attributes that would help the risk-adjusted returns of a portfolio and should make the portfolio more efficient during highly. Based on this, we hypothesize that the benchmark portfolio will become more efficient if P2P lending is included.

Table 2. P2P Returns vs. Benchmark Portfolio

Asset	Annual Return	Volatility	Return-to-risk ratio
Initial Portfolio	0.069988096	0.403880638	0.17328906
P2P	**0.051782921**	**0.027057340**	**1.91382153**

Table 3. Assets Correlations Matrix

	VTI	VPACX	VEURX	VBR	VNQ	AGG	TIP	VWEHX	P2P
VTI	**1**	0.85	0.88	0.96	0.82	0.08	0.09	0.75	0.19
VPACX	0.85	**1**	0.88	0.14	.069	0.14	0.14	0.67	0.13
VEURX	0.88	0.88	1	0.82	0.71	0.14	0.15	0.70	0.14
VBR	0.96	0.80	0.82	**1**	0.86	0.07	0.07	0.72	0.13
VNQ	0.82	0.69	0.71	0.86	**1**	0.26	0.28	0.69	0.18
AGG	0.08	0.14	0.14	0.07	0.26	**1**	0.76	0.32	-0.13
TIP	0.09	0.14	0.15	0.07	0.28	0.76	**1**	0.33	-0.02
VWEHX	0.75	0.67	0.70	0.72	0.69	0.32	0.33	**1**	0.01
P2P	0.19	0.14	0.4	0.13	0.18	-0.13	-0.02	.001	**1**

To explore our main hypothesis, we then introduced P2P lending in for 10 levels of returns to see what combination of assets offered the best risk adjusted returns. To accomplish this, we optimized the portfolio allocations using a non-linear optimization technique to optimize the Sharpe ratio for each expected return. The Sharpe Ratio for the tests run in this study is defined as follows:

$$\text{Sharpe} = \frac{\text{E}[\text{R}_\text{a} - \text{R}_\text{f}]}{\sqrt{\text{var}[\text{R}_\text{a} - \text{R}_\text{f}]}}$$

R_a is the asset return, R_f is a risk free rate. E[R_a-R_f] is the expected value of the excess of the asset return over a risk free rate, and var is the the variance of this excess return. The risk free rate and expected of the excess return were both set to 0. We then ran simulations to find the optimized asset allocation for each given rate of expected return. Table 4 presents the results and shows that for all levels of expected returns that P2P should be given a significant allocation of the portfolio. For the low end of expected returns, the allocation of P2P is the largest. This is not a surprise as it has the lowest rate of volatility. For the highest rate of returns, P2P is factored in the least. However, it is still a significant

portion of the portfolio. For example, optimized 9.5% returns call for 9% of the portfolio to be allocated to P2P.

Table 4. Optimum Portfolios

Performance										
Expected Return	**4.87%**	**5.00%**	**6.00%**	**6.50%**	**7.00%**	**7.50%**	**8.00%**	**8.50%**	**9.00%**	**9.50%**
Volatility	0.9%	0.9%	1.3%	1.6%	1.9%	2.3%	2.7%	3.0%	3.4%	3.8%
Return / Volatility	5.67	5.72	4.72	4.05	3.60	3.26	3.00	2.79	2.63	2.50
Allocation										
VTI	2%	3%	23%	20%	31%	35%	38%	42%	46%	49%
VPACX	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VEURX	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VBR	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%
VNQ	0%	0%	0%	6%	7%	11%	15%	19%	23%	27%
AGG	84%	76%	60%	50%	43%	34%	26%	17%	9%	1%
TIP	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%
VWEHX	0%	2%	4%	10%	7%	8%	10%	11%	13%	14%
P2P	14%	16%	13%	12%	12%	11%	10%	10%	9%	9%

DISCUSSION AND CONCLUSIONS

The exploratory findings from this study suggest that P2P lending is an asset class that can make portfolios more efficient. These findings are not conclusive and need further testing. More specifically, P2P returns need to be looked at from several different perspectives and tested against many more assets before we can make any final conclusions. Furthermore, P2P has only been around for nine years. During this nine year period P2P lending has rapidly evolved, and this had a bearing on the results. In the first few years, the charge off rates were much higher because the industry was still working out its lending requirements. In the past four years, the industry has tightened its lending requirements, and because of this the charge offs have gone down and stabilized. Therefore, it seems that the market adjusted returns on P2P lending will go up as the industry continues to mature. However, this will need to be monitored and tested.

P2P lending is an emerging asset class that appears to have great potential in improving portfolio efficiency. The findings from this study are just preliminary, but they do suggest that this is an asset the investors should consider looking at, especially in the low interest climate that we are presently in. P2P offers the potential for higher risk adjusted returns than comparable assets.

From a practical standpoint, technology has made it easy for investors to participate in P2P investing. They can simply open an account on one of the major P2P lending platforms and start investing in notes. Alternatively, there are platforms that robotically pick loans for investors. These sites use advanced data analysis techniques to optimize returns based on investors' objectives. Moreover, on most platform investors can use money from their qualified investment accounts to invest.

In summary, the early evidence suggests that P2P lending is an asset investors and financial advisors should give serious consideration to. It appears that it could help investors achieve alpha. There are many opportunities to further explore this topic. For example, future studies could look at it from different return perspectives, such STARR and Rachev ratios. In addition, as more and more data becomes available, researchers could reexamine the results that were produced in the present study. It would also be interesting to look at cross-country comparisons of P2P lending returns, as P2P ratios exist in several different markets across the world.

This study makes several contributions to theory and practice. From a theoretical standpoint, it shows the effect of technology on modern portfolio theory. From a practical standpoint, it shows how a particular type of technology, P2P lending, can be used in practice to improve portfolio efficiency.

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