

*Does Third Party Origination affect recovery risk? Evidence from the US Single-Family Loans*

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## Abstract

Mortgage origination may affect the borrowers' selection procedure and have an impact on the risk of losses in the event of default. Third Party Origination (TPO) is frequently used to support borrowers' access to the lending market who do not interact directly with traditional lenders, and its role is mostly relevant in the residential mortgage market.

The paper considers the residential mortgages in USA and point out differences between those that were issued by using traditional selling channels and TPOs by considering both the probability of default and the loss given default. Results shows that there are small differences in the ex-ante evaluation of the loans' risk profiles but ex-post the risk assumed by the banks is higher for both the frequency and the economic relevant of the defaults.

Keywords: mortgages, probability of default, loss given default

## 1. Introduction

Mortgages are mainly originated to fund residential real estate loans to single families, representing more than the 69% of total mortgages and roughly the 39% of total loans in the US market<sup>1</sup>. The growth of residential mortgages is based on a chain involving many roles, from the borrower to the originator to the lender, who at least initially funds a loan, to investment bankers, underwriting mortgage-backed securities, to mortgage-backed security guarantors, such as Ginnie Mae, Fannie Mae, and Freddie Mac, to investors in mortgages (Green, 2014). In particular, residential loans can be originated through the retail or the wholesale channel, the latter involving the intervention of brokers and correspondents whose importance is growing with the market share of purchase loans but declining profit margins across the board (Fratantoni, 2019). Empirical evidence shows that the competition between the retail and the wholesale channel is becoming intense as brokers are found to negotiate

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<sup>1</sup> Mortgage debt and total loans are determined using the quarterly Federal Reserve Statistical Release, "Z.1: Financial Accounts of the United States" tables L.214, 217 and 218, "One-to- Four Family Residential Mortgages", household sector liabilities. Data on September, 30, 2023.

roughly 40% of contracts, and such percentage increases for first-time house buyers. The quality of the residential mortgage loans originated through third parties is found to be poor and, among possible solutions, self-selection by customers is verified with the role of the third party to act to make conforming customers' requests (Allen, Clark, Houde, Li and Trubnikova, 2023), even though little is known on the impact of the features of the property, the purpose of the loan, the location, Additionally, the available literature focuses on the risk of default, but little is known on the impact of wholesale channel on the recoveries that contribute to the performance of the loan (Qi and Yang, 2009). Lastly, the available literature develops analysis of the pricing of risk of third party loans based on the interest rates applied, but little is known on the impact of the risk of wholesale channel loans on the insurance premia.

The paper extends the knowledge on the relationship between the features of the exposure associated with third party originated loans and risk based on recoveries. Additionally, the paper explores the relationship between insurance premium and the features of third party originated loans with respect to the loans originated by the retail channel. Results show that the main differences between TPOs and other loans are not related to the origination stage but to the management and the recovery stage. TPOs' loans are characterized by an higher past due risk and a lower percentage of recoveries in the event of default.

## **2. Literature review**

Origination is the principal point of contact between households and firms providing mortgage finance services, developing through the retail or wholesale channel. Retail channels place the borrower and the primary lenders in direct contact, while wholesale channels introduce the third-party origination (hereinafter, TPO) of the mortgage. In particular, in the wholesale channel third parties underwrite and originate loans directly to households adopting specific underwriting standards, typically those of the secondary market agencies for loan size, or lender guidelines (LaCour-Little, 2000). Specifically, a broker matches a borrower to a lender who underwrites and funds the loan at closing, while a correspondent underwrites and funds the mortgage at closing and then sells in the secondary market (Stanton, Walden and Wallace, 2014). Regardless of the type of the entity, TPOs are involved only in the origination of the loan and the results of the subsequent performance do not impact on their compensation, raising potential conflicts both with the lender and the borrower. According to the agency theory, conflicts with the lender can arise like prepayment risk because TPOs have incentives to churn the customers to obtain additional fees (LaCour-Little and Churn, 1999) and to adopting poor

screening in the underwriting process affecting the credit risk of the exposures (Keys, Mukherjee, Seru, and Vig, 2010). Looking at possible conflicts with borrowers, TPOs affect households' choices by steering borrowers toward riskier products with respect to the proper offer (Agarwal, Ambrose and Yao, 2017) and causing the self-selection by riskier borrowers to obtain the mortgage loan (Dungev, Tchatoka, Yanotti, 2018). Empirical evidence shows that TPO loans are differentially worse than retail loans as they are found to default more frequently than retail originated loans featured by the same ability to pay, option incentives, and the location of the mortgage (Alexander, Grimshaw, McQueen and Slade, 2002), even though obtaining a mortgage is non more a local activity with to the place of the property. The investigation of possible explanations for TPO loans higher risk shows that borrowers unobserved preferences, different from the observed original loan amount, the interest rate, the LTV, the amortization duration features, affect the choice of risky loans by debtors while TPOs help them to qualify for these products (Agarwal, Amromin, Ben-David, Evanoff, 2016).

It is important to note that most of the empirical evidence on the risk of TPO originated mortgages concerns default risk, while little evidence is showed for loss rates that reflects the performance of the loan. In particular, the severity of loss can be affected by the characteristics associated with the loan, the underlying property, the foreclosure, settlement, and process features (Qi and Yang, 2009). Securitized mortgages incur higher losses than observably similar portfolio loans, and such evidence is attributed to poor underwriting standards; among third parties operating in the mortgage value chain, servicers are found to affect positively observed losses (Higgins, Yavas, Zhu, 2022).

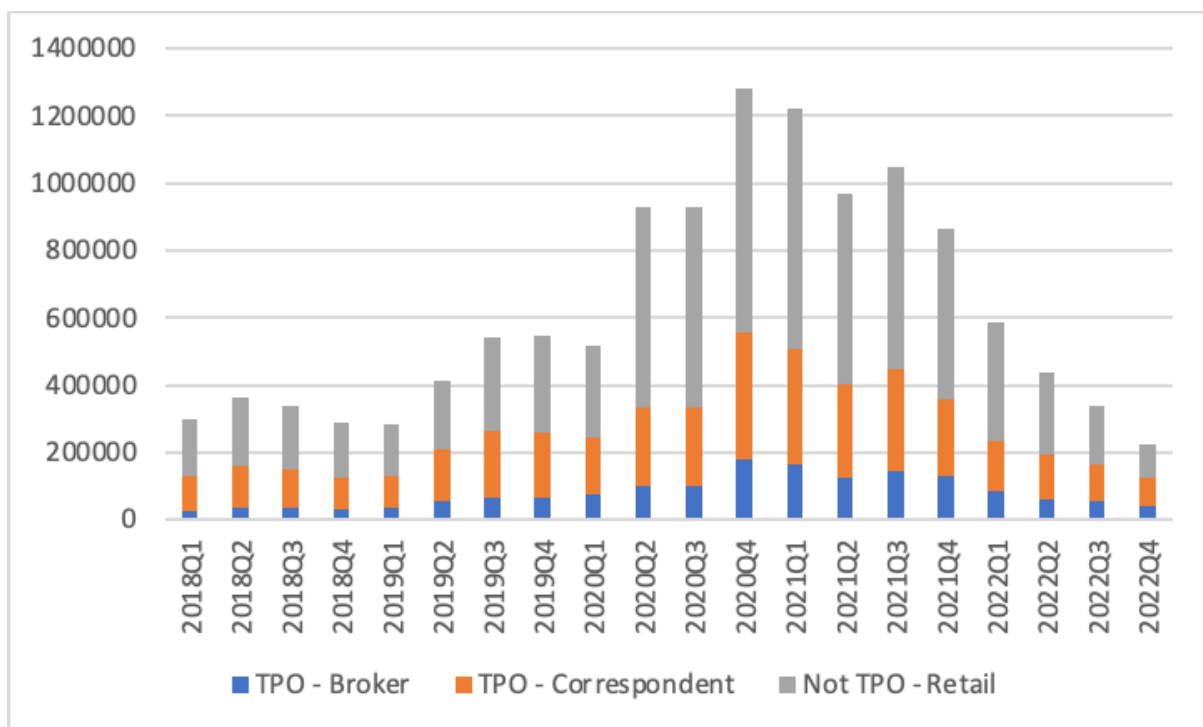
Lenders price the higher risk of TPO loans by applying higher interest rates (Agarwal, Ambrose, and Yao, 2017), even though such pricing of risk can be affected by endogeneity as the cost of the mortgage loan is applied by the creditor that can adjust it to enhance the interest margin and is also a function of the features of the product more than the risk of the debtor. Differently from interest rates, mortgage insurance is a contract in which lenders or investors are compensated by an insurance entity, not involved in the origination or funding of the loan, for losses in the event of a default by the borrower: empirical evidence shows that loans insured, either government or private, indicate higher default risk (Pork, 2016).

### 3. Empirical analysis

#### 3.1 Sample

The sample considers all the loans included in the single-family loan-level dataset provided by Freddie Mac for the period 2018-2022. Data collected allow distinguishing loans issued directly by the bank and by a third-party organization (Broker or Correspondent) (figure 1).

Figure 1. Sample



Source: Freddie Mac data processed by the authors

For each of the quarters, we have in the sample at the minimum 222,225 (4th quarter of 2022) and at the maximum 1,282,769 loans (4th quarter of 2020), and, on average, the majority of the loans are not generated through a TPO (57.1%). Correspondent banks are the second most common solution for issuing mortgages (29.9%), and brokers are the less common solution (12.9%). The role of the TPOs reached the maximum in the second half of 2020 and 2021, but there is no a clear growing or decreasing trend over the years.

A preliminary analysis of the sample characteristics allows the identification of the main differences in the risk profile of TPOs and other mortgage loans at the origination stage (Figure 2).

Table 1. Risk profile of TPOs and not TPOs at origination

	Credit Score		LTV		Interest rate		Borrowers	
	TPO	Not TPO	TPO	Not TPO	TPO	Not TPO	TPO	Not TPO
2018Q1	747.24	745.86	76.31%	73.35%	4.42%	4.36%	1.47	1.46
2018Q2	749.39	748.27	78.41%	75.78%	4.73%	4.72%	1.48	1.47
2018Q3	748.36	747.62	78.51%	75.87%	4.83%	4.81%	1.47	1.48
2018Q4	747.93	757.97	77.21%	74.43%	5.05%	5.01%	1.46	1.47
2019Q1	748.88	754.18	77.50%	74.54%	4.73%	4.74%	1.46	1.46
2019Q2	751.59	757.04	78.50%	75.79%	4.37%	4.38%	1.47	1.48
2019Q3	753.45	756.88	76.78%	74.84%	3.97%	3.95%	1.47	1.48
2019Q4	752.52	755.79	75.42%	73.30%	3.89%	3.86%	1.47	1.48
2020Q1	754.77	756.10	73.59%	72.07%	3.69%	3.69%	1.46	1.48
2020Q2	760.47	759.77	70.80%	70.79%	3.26%	3.27%	1.49	1.52
2020Q3	762.37	759.10	69.13%	69.00%	2.80%	2.88%	1.49	1.50
2020Q4	762.37	759.10	69.13%	69.00%	2.80%	2.88%	1.49	1.50
2021Q1	760.07	757.08	68.86%	67.73%	2.76%	2.83%	1.49	1.49
2021Q2	753.75	751.29	71.89%	68.55%	3.03%	3.05%	1.48	1.48
2021Q3	751.08	748.18	71.97%	68.41%	2.97%	2.99%	1.47	1.46
2021Q4	749.61	744.64	71.29%	67.49%	3.08%	3.07%	1.45	1.45
2022Q1	747.74	741.68	71.99%	68.20%	3.59%	3.54%	1.44	1.44
2022Q2	749.19	741.65	76.24%	72.61%	4.93%	4.82%	1.47	1.45
2022Q3	750.13	744.25	77.87%	74.07%	5.49%	5.54%	1.47	1.45
2022Q4	751.18	747.47	77.92%	73.73%	6.37%	6.42%	1.48	1.44
Average	752.60	751.70	74.47%	71.98%	4.04%	4.04%	1.47	1.47

Source: Freddie Mac data processed by the authors

Borrowers that use the TPO channel have on average the same ex-ante risk of the other borrowers (similar credit score), but the amount of loan given is frequently higher with respect to the value of the real guarantee (Loan to Value). The higher amount of loan offered by TPOs do not significantly affect the average interest rate applied and there are no significant differences also in the number of borrowers that apply for the loan (on average 1.47 for TPOs and traditional channels).

### 3.2 Methodology

The analysis of the recovery risk will consider the probability of default by using the definition of the 90 days past due adopted in the Basel III agreements and without applying any materiality threshold. In formula:

$$PD_i = \begin{cases} 1 & \text{if past due} \geq 90 \text{ days} \\ 0 & \text{otherwise} \end{cases} \quad (1)$$

The analysis of the risk of recovery considers for the defaulted entities two proxies of the loss given default computed as follows:

$$LGD_i = \frac{\text{Net sales proceeds}_i}{\text{Deferred UPB}_i} \quad (2)$$

The analysis proposed considers jointly the characteristics of the borrowers and the real estate assets financed. In formulas:

$$PD_i = \alpha + \sum_{i=1}^n \beta_i CV_t + \varepsilon_i = \alpha + \beta_1 FTHB_i + \beta_2 MI\%_i + \beta_3 N^\circ Units_{it} + \beta_4 HouseType_i + \beta_5 Refinancing_{it} + \beta_6 OccupancyStatus_i + \beta_7 CLTV_{it} + \beta_8 DTI_i + \beta_9 N^\circ Borrowers_i + \varepsilon_i \quad (3a)$$

$$PD_i = \alpha + \sum_{i=1}^n \beta_i CV_t + \gamma Channel_i + \varepsilon_i = \alpha + \gamma Channel_i + \beta_1 FTHB_i + \beta_2 MI\%_i + \beta_3 N^\circ Units_{it} + \beta_4 HouseType_i + \beta_5 Refinancing_i + \beta_6 OccupancyStatus_i + \beta_7 CLTV_i + \beta_8 DTI_i + \beta_9 N^\circ Borrowers_i + \varepsilon_i \quad (3b)$$

$$LGD_i = \alpha + \sum_{i=1}^n \beta_i CV_t + \varepsilon_i = \alpha + \beta_1 FTHB_i + \beta_2 MI\%_i + \beta_3 N^\circ Units_{it} + \beta_4 HouseType_i + \beta_5 Refinancing_{it} + \beta_6 OccupancyStatus_i + \beta_7 CLTV_{it} + \beta_8 DTI_i + \beta_9 N^\circ Borrowers_i + \varepsilon_i \quad (4a)$$

$$LGD_i = \alpha + \sum_{i=1}^n \beta_i CV_t + \gamma Channel_i + \varepsilon_i = \alpha + \gamma Channel_i + \beta_1 FTHB_i + \beta_2 MI\%_i + \beta_3 N^\circ Units_{it} + \beta_4 HouseType_i + \beta_5 Refinancing_i + \beta_6 OccupancyStatus_i + \beta_7 CLTV_i + \beta_8 DTI_i + \beta_9 N^\circ Borrowers_i + \varepsilon_i \quad (4b)$$

where the independent variables are the following:

$FTHB_i$ = dummy variable that assumes value 1 if it is a first time home buyer;

$MI\%_i$ = percentage of governmental insurance on the housing loan;

$N^{\circ}Units_i$ = number of rooms of the building;

$HouseType_i$ = dummy variable that assume value 1 for detached house and zero otherwise;

$Refinancing_i$ = dummy variable that assume value 1 if the loan is a refinancing and zero otherwise;

$OccupancyStatus_i$ =dummy variable that assume value 1 if the borrower leaves in the house and zero otherwise;

$CLTV_i$ = Combined loan to value for the borrower;

$DTI_i$ = Debt to Income Ratio;

$N^{\circ}Borrowers_i$ = Number of borrowers for each mortgage;

$Channel_i$ = Dummy variable that assume value 1 if it was originated by a TPO and zero otherwise.

The analysis is performed by using a cross section analysis on quarterly data for evaluating the impact of the TPO on the PD and the LGD for mortgages.

### 3.3 Results

The analysis of the TPOs on the ex-post risk drivers allows to identify some interesting differences on the basis of the channel used (Table 2).

Table 2. The role of TPOs in estimating PD and LGD

	PD		LGD	
	(3a)	(3b)	(4a)	(4b)
$FTHB_i$	0.01*	0.01*	0.14*	0.14*
$MI\%_i$	0.02**	0.01*	0.22*	0.25*
$N^{\circ}Units_{it}$	-0.03**	-0.03**	-0.45*	-0.45*
$HouseType_i$	-0.01**	-0.01**	-0.34**	-0.34**
$Refinancing_i$	+0.01**	+0.01*	+0.32*	+0.32*
$OccupancyStatus_i$	-0.01**	-0.01*	-0.41**	-0.41**
$CLTV_i$	+0.07**	+0.07**	+0.71**	+0.71**
$DTI_i$	-0.10**	-0.09*	-0.15**	-0.15**
$N^{\circ}Borrowers_i$	-0.03**	-0.03**	-0.23**	-0.23**
$Channel_i$		+0.04*		+0.13**
$\alpha$	0.40**	0.40**	1.75**	1.75**



Type of regression	Logit	Logit	OLS	OLS
Chi Square (p-value)	23.45 (0.00)	40.45 (0.00)	-	-
Adjusted R <sup>2</sup>	-	-	0.19	0.21

Source: Freddie Mac data processed by the authors

Notes: \*\* Statistically significant at 99% level \*\* Statistically important at 95% level

Borrowers that buy a house for the first time usually are riskier than others because they need to gain expertise in managing the loan exposure in the medium long term. Usually, they buy assets that are not too expensive, so assets probably cannot preserve their value over time.

A higher percentage of governmental insurance on the loan increases the risk appetite for the lenders, and both PD and LGD are positively affected by the existence of governmental insurance.

Larger houses and villas are usually bought by safer households that can afford the higher expenses related to the investment, so the frequency of default is generally lower, and the recovery rate is higher. The same results are associated with the type of houses, and the overall risk is lower for independent houses concerning condominiums.

Loans that represent a refinancing of existing loans usually are riskier for both the risk of default and the recovery losses. Homeowners that live in the asset typically are less risk than the average due to the lower risk of default and the greater attention on the maintenance of the asset over time and the value of the guarantee.

Loans representing a higher percentage of the value of the guarantee are typically riskier because the mortgage refunding could probably be more economically sustainable for the borrower. Usually, the cost of the maintenance for the houses is postponed until it is highly needed. The risk of losses in the event of default is significantly higher because the selling value of the guarantee will be lower.

The Debt Income ratio represents a proxy for valuing the sustainability of the loans, and higher values of the ratio usually imply a lower sustainability of the mortgage contract. Typically, loans that more borrowers subscribe to are less risky because the risk that both borrowers will be unemployed simultaneously is relatively low.

The selling channels matter in predicting both the probability of default and the recovery rate, and empirical models that consider the dummy on the TPO channel have a better fit with the data. Loans originating through TPOs are usually characterized by a higher frequency of defaults and lower recovery rates and are riskier for the lenders.

#### 4. Conclusion

TPOs are standard solutions for offering residential loans in the United States, and there is no apparent difference between mortgages provided through this channel and the more traditional one. Lenders do not apply different pricing policies for loans based on the type of the loan, and also, the credit score of the borrowers is comparable.

The analysis of the performance of the loans after the issuing shows some interesting differences in the probability of default and the loss given default. Lenders that originate loans through TPOs typically assume higher risk than other financial institutions that offer direct mortgages to their customers.

The regulator is not applying different capital requirements based on the selling channel of the loans, and lenders that outsource the origination procedure can underestimate the risk assumed. Capital reserves for financial institutions that use TPOs could be overstated with respect to the real needs of the financial institution. More analysis is necessary for understanding the main differences in the customers served by TPOs and the others and identifying better the type of customers and areas that could represent the riskier scenario for a lender that outsources the loan origination.

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