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An Analysis of Mortgage Closing Costs

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Abstract

Fair and affordable access to credit for borrowers remains an important public policy objective. While some believe that significant improvements in mortgage markets have led to more efficient and lower cost access to a greater variety of mortgage products, others believe that lending practices remain abusive over certain dimensions. Often, the abusive or predatory practices are found to be most prevalent in the subprime market. There remains significant debate, however, over the desirability of some aspects of lending behavior in the prime market as well. In this research, we focus on the use of yield spread premiums (YSPs), a payment made by the lender to a mortgage broker that is reflected in the closing costs paid by the consumer for a loan.

We use data collected from a national lender. The data allow us to characterize the types of borrowers in the prime market who use yield spread premiums to finance their mortgage, to address the impact of the yield spread premium on consumer closing costs and net mortgage broker compensation, and broadly to assess market outcomes.

We find that borrowers who use yield spread premiums can usefully be segmented into three types: those who finance all of their closing costs using this mechanism, those that use YSPs as part of their financing package, and those that do not incur any yield spread premium in the process. We find that those borrowers who did not use YSPs or those who paid some of their closing costs with YSPs disproportionately pay higher closing costs than did the other segments. We predict that those who paid all their closing costs using YSPs had the lowest costs.

Moreover, we find that differences in the closing costs paid, either measured as out-of-pocket costs or closing costs including YSPs, cannot fully be explained by adjusting for related risk factors such as credit score and loan-to-value (LTV) ratios. It is likely that other factors such as search behavior or financial sophistication on the demand side, and the ability of the broker (or lender) to extract rents on the supply side, also affect both the incidence and severity of the impact of yield spread premiums.

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Introduction

The issues concerning real estate settlement procedures and the use of yield spread premiums (YSPs) continue to generate considerable controversy among policy- and lawmakers. The legal interest is reflected in rulings pertinent to the interpretation of the Real Estate Settlement Procedures Act (RESPA).¹ While HUD continues to engage in research on RESPA reform, public controversy remains significant enough that Acting Secretary Jackson of HUD recently withdrew the proposed changes to RESPA sent to the Office of Management and Budget in December 2003: “Due to the importance of HUD’s efforts to reform the regulatory provisions of the Real Estate Settlement Procedures Act (RESPA) and the extensive concerns from Members of Congress, consumer groups and the business community, Acting Secretary Jackson has withdrawn the rule from the Office of Management and Budget (OMB).”²

In this paper, we address the determinants of consumer closing costs. One determinant clearly is the use of yield spread premiums, a financing mechanism through which the lender transfers payments to brokers for loan origination services. The YSP results from a choice made by the lender or consumer to offer a premium to a mortgage broker for a loan that is considered to be above par. In simplest terms, an above par loan carries an above-market interest rate. It is the excess of the loan price over par value that constitutes the YSP. This payment, for the above par loan, is made from the lender to the mortgage broker. It can be used, for example, for “zero closing cost” loans (no cost refis), to compensate the mortgage broker for paying the closing costs on behalf of the borrower. The borrower, rather than paying cash at settlement (closing), pays a higher interest rate over the duration of the mortgage obtained. It is in this sense that some view the YSP as an efficient mechanism for mortgage financing and one that can improve access to credit for those cash-constrained borrowers who might otherwise be unable to offer the funds needed for closing costs. An alternative view would hold YSPs to be a mechanism for increasing net mortgage broker compensation over what it would be in the absence of YSPs. This might occur if the brokers did not use the YSPs fully to offset consumer closing costs. That

¹ Pub. L. No. 93-533, 88 Stat. 1724 (1974). Section 8.

² See *Inside Mortgage Finance*, 2003:123, March 28, 2003, p. 3 & (<http://www.hud.gov/news/resparule.cfm>)

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is, the YSP would serve as additional compensation for the broker, while the consumer would not receive the full benefit of the above market interest rate they paid.³

HUD, in looking at the economic impact of changes in the practice of reporting and disclosing YSPs estimates that total YSPs on HUD-defined brokered loans will total approximately \$4.5 billion in 2003. The amount considered to be used as an offset to consumer closing costs varies across research studies. Jackson (2002) indicates that about 25 percent of the YSP is used to offset closing costs while Woodward (2002, 2003) finds that nearly 75 percent of YSPs are passed through to compensate for other closing costs.⁴ Thus, claims HUD, the value to consumers that might be transferred back from the broker may vary from \$1.125 to \$3.375 billion during 2003.

In our analysis of consumer closing costs, we recognize that there are three distinct segments of borrowers that use YSPs differentially. We also recognize that there are two parts to the total consumer costs. First, we look at “out-of-pocket” closing costs including actual fees paid by the consumer such as mortgage broker compensation, itemized mortgage broker expenses, lender fees, and other itemized fees paid through the lender. Next, we consider the second part of the consumer costs to be the value of the increased interest rate payments over the life of the mortgage that results from obtaining a loan with an above-market interest rate. Ideally, one would be able to measure the present discounted value to the consumer of this additional expense by applying an appropriate time rate of discount. However, that solution is impractical. One alternative way to think about this additional cost is to infer that, in fact, the yield spread premium serves as a proxy and represents the “market” valuation of this present discounted value. It does, in fact, represent the value to the lender of the above par loan.

After examining the impacts on consumer costs (with and without YSPs), we also attempt to measure the economic rents that might accrue to the broker during the origination process.

³ For a complete description of exactly how YSPs can be used in the settlement process, see U.S. Department of Housing and Urban Development, Office of Policy Development and Research, “Economic Analysis and Initial Regulatory Flexibility Analysis for RESPA Proposed Rule to Simplify and Improve the Process of Obtaining Mortgages to Reduce Settlement Costs to Consumers,” July 2002.

⁴ Jackson, H. and J. Berry, “Kickbacks or Compensation: The Case of Yield Spread Premiums,” working paper, January 2002, and Woodward, Susan E. “Consumer Confusion in the Mortgage Market,” Sandhill Econometrics Working Paper, July 2003 and Woodward, Susan E., Statement to the Senate Committee on Banking, Housing and Urban Affairs, January 2002.

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Our specific concern is whether there may exist some selection of borrowers across the three segments (some, no and all YSP) and, in particular, whether that selection occurs in a way that is associated with consumer costs. To address this concern, we first measure the impact of YSPs on consumer costs attributable to the set of explanatory variables available. To the extent that the consumer costs cannot be fully explained, we posit that the portion unexplained embodies some of the impacts of unobserved variables that might be correlated with costs, and might also be correlated with the selection of borrowers across the three segments (some, no, or all YSP). In particular, it seems likely that the degree of financial sophistication of the borrower, and the ability to search effectively for best rates and terms, might play a role in the degree to which they bear ultimate consumer costs. Further, the consumer costs borne by the more financially unsophisticated borrowers might be higher as brokers find they can more easily extract rents through two mechanisms: either by charging higher origination fees or through not fully passing through yield spread premiums.

We model the effect of the unobserved variables (reflecting financial sophistication and other factors) through three differential error terms. The first error term is the normally distributed error term reflecting idiosyncratic differences across borrowers. The second and third error terms reflect the differential borrower (self-selection) or broker (rent extraction) behaviors. The third error term also reflects the impact of large outliers and can be taken to represent incidences for which there remains a large, positive, unexplained component in the estimation of consumer costs.

The paper is organized as follows. In the following section, we discuss the data used for this analysis. Next we introduce a new conceptual framework for the analysis of the yield spread premium question. Using this experiment, we estimate the impact of yield spread premiums, through direct and indirect effects, on consumer costs. Finally, we introduce an econometric specification designed to measure differential borrower behavior (through self-selection into segments) and differential broker behavior (through economic rents extracted by brokers from consumers). We then conclude.

The Data

Sample characteristics

The data used in the analysis comprised a segment of the population of loans made available from a national lender. In the sample of loans we examined, 1806 (86 percent) of the loans had yield spread premiums. The average size of the YSP in the sample was \$1848. We adjusted the sample further to include only loans with broker compensation in excess of \$250, and with other fees that were greater than zero.⁵ This resulted in a final sample of 2017 loans.⁶ In Table 1 we present some distributions of the average points of YSP across race, credit score, and loan-to-value ratio.

Table 1: Average Points of YSP Relative to Loan Size

Variable	Number	Average Points
Hispanic	62	.018
White	1888	.013
African-American	67	.020
Fico: 400 – 619	75	.023
Fico: 620 – 679	270	.016
Fico: 680 – 749	962	.013
Fico: 750 & up	581	.012
LTV Ratio: 10 – 80	1280	.011
LTV Ratio: 81 – 90	272	.014
LTV Ratio: 91 – 97	347	.017
LTV Ratio: 98 & up	118	.028

Based on these univariate measures, the amount of YSP increases with minority status, lower credit score and higher LTV ratio, with the highest mean YSP points being borne by those with

⁵ We consider FICO scores outside the range of 400 to 850 as invalid.

⁶ We examined, in addition to the Jackson and Woodward data, both prime and subprime data obtained from Freddie Mac purchased loans. Those results will be included in future research.

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high LTV ratios and low credit scores simultaneously. Tables 2 and 3 present the distribution into the three borrower segments by credit score and loan-to-value ratio respectively.

Table 2: Distribution of YSP Segment by Credit Score

FICO	All YSP	No YSP	Some YSP	Total (Percent)
400 – 619	3.23	0.42	4.66	3.72
620 - 679	11.95	9.58	14.94	13.39
680 – 749	50.40	52.50	45.25	47.69
750 & up	28.92	33.33	27.81	28.81
invalid	5.49	4.17	7.34	6.40
Total	100	100	100	100.00

Table 3: Distribution of YSP Segment by LTV

LTV	All YSP	No YSP	Some YSP	Total
10 – 80	64.78	79.17	59.50	63.46
81 – 90	12.44	12.08	14.34	13.49
91 – 97	19.39	7.50	18.05	17.20
98 & up	3.39	1.25	8.12	5.85
Total	100	100	100	100.00

In addition to examining the impacts of credit score, LTV, and YSP on consumer costs, we also consider the effects on consumer costs and net mortgage broker compensation of the type of mortgage product (fixed rate or adjustable rate mortgages), mortgage market (conventional, conforming, or jumbo or government insured (FHA)), mortgage purpose (purchase or refinance), income, mortgage broker discount points, and race.

Variables

Dependent Variables

We define consumer costs to be composed of two parts: the net costs paid at closing (as defined below) and the estimated present discounted value of the increased interest rate paid for above par loans where we assume that, in part, the consumer opts to take the higher interest rate

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resulting in higher payments over time in lieu of higher actual costs at closing. This can, if markets work well, arguably be proxied by the value of YSP.

$$\text{Consumer Costs} = \text{Net costs paid at closing:}^7 \\ \text{originf} + \text{otherf} - \text{credith} + \text{mbit} + \text{lgenl} + \text{lit} + \text{pt} + \text{mbuydown}$$

where:

Originf: origination fee paid to mortgage broker, from HUD-1s.

Otherf: Other fees paid to mortgage broker from the HUD-1s, excluding origination fees.

Credith: credits from the mortgage broker, whether from the 200's series of the HUD-1s or from the 800s series, or elsewhere (as measured by Jackson)

Mbit: mortgage broker itemized fees, from HUD-1s, including appraisal fees, courier fees, credit report fees, and flood certification fees.

Lgenl: lender general fees, defined as lender fees not categorized as lender itemized fees, and includes, from the HUD-1s, such fees as funding fees, processing fees, document preparation fees, and application fees.

Lit: lender itemized fees, defined as the following fees paid to lender: flood certification, courier, credit report, and appraisal, all from HUD-1s.

Pt: pass-through fees, defined as fees paid to the title company for title searches and other goods and services, title exams, title insurance, notary fees, attorney fees, and recording fees.

Buydown: amount of loan buydown, taken from defendant's electronic data.

Table 4: Mean YSPs by Consumer Segment

Segment	Net Mortgage Broker Cost	Consumer Costs	Consumer Costs with YSP
All YSP	2311.82	1567.31	4105.28
No YSP	2028.84	4488.73	4488.73
Some YSP	2648.00	2946.05	4434.25

⁷ A difference in this definition for consumer costs and that used by Jackson is that we do not net out "self credits" paid by the broker on behalf of the consumer. Results were invariant to this adjustment.

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Independent Variables

We include different variables as explanatory in the different sections of our analysis.

These include:

Loansize – this is modeled as a continuous variable

FICO ranges – < 400 (invalid); 400 – 619; 620 – 679; 680 – 749; 750 and up

LTV – 10 - 80; 8 - 90; 91 - 97, 98 and up

Product – loan product (30 year fixed, ARM, etc.)

Market – jumbo (greater than secondary market conforming loan limit) or not

Dmbdisc – indicates the presence of discount points paid to the broker rather than the borrower

Drefi – refinance

Dthree, Dfour : race variables (three is African American; four is Hispanic)

Buydown – amount of loan buydown

Income – MSA level income

Results from Specification Differences

In an attempt to identify why previous researchers summarize differently the impact of YSPs on consumer costs and net mortgage broker compensation, we first analyzed the data with a focus on net mortgage broker compensation as a function of YSPs, controlling for other facts. We considered alternative sets of explanatory variables included, and different functional forms governing the inclusion of YSP in the equation.

The choice of explanatory variables had an impact for some specifications, but generally the greatest impact resulted from changes in the functional form of the YSP variables included.

For model 1:

$$\text{Mbcomp1} = f(\text{YSP}, \text{dmbdisc}, \text{loansize}, \text{dfixed30}, \text{dgovt}, \text{drefi}, \text{FICO}, \text{LTV}, \text{Hispanic}, \text{African-American}, \text{state indicator variables for CA, FL, IL, NY, and TX}).$$

For model 2:

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Mbcomp2 = f(YSP, buydown, loansize, lockdays, LTV, FICO, dfixed30, daystoend, daminus, dtrouble, Hispanic, African-American, mktrate, income)

The differences can be observed by examining the equations that preserve the same functional form, but allow explanatory variables to differ. We consider three different specifications for the inclusion of the YSP variable: as a dummy variable taking on a value of 1 for presence of a YSP and 0 otherwise; as a linear variable or as a quadratic specification. We then compare results across differences in variable inclusion, holding constant the dependent variable and the specification of YSP. For example, one can compare results as follows: dummy YSP, Model 1 variables, dependent variable (mbcomp1) with: dummy YSP, Model 2 variables, dependent variable (mbcomp2), and similarly for the linear and quadratic specifications.

The differences observed by using alternative variable specifications are largest across the dummy specifications (Model 1 coefficient (in percent) on dysp = 47; Model 2 coefficient (in percent) on dysp = 20). The differences narrow under the alternative specifications (Model 1/linear on ysp = .57; Model 2/linear on ysp = .53). Specifically, the linear model is most consistent across variable specifications while the dummy model is least consistent across variable specifications. To summarize the alternatives, we provide “impact” tables that present the combined effects of the YSP variables on the dependent variables (see Tables 5 and 6 below).

The impact of functional form for YSP variables can also be seen in the tables below. There are significant differences in impact found by changing from a dummy specification for YSP to either a linear effect or a quadratic effect. Further, holding all else the same, the impact of the YSP variable does vary substantially between linear and quadratic specifications. For example, in Table 5, the linear version of model 1 has a value of 57 that means that for every incremental dollar paid in the form of YSPs, the broker receives \$0.57. Similarly, in the quadratic model 1, the median impact reflects that the broker receives \$0.42 for each incremental dollar.

Table 5
Model 1 specification: broker compensation impacts

YSP	Measure	Count	Average	Minimum	P10	Median	P90	Maximum
Dummy	dollar	1658	685	685	685	685	685	685
Linear	dollar	1658	1041	31	251	835	2110	5354
Quad	dollar	1658	865	19	164	609	1879	6959
Dummy	percent	1658	79	7	19	47	157	1275
Linear	percent	1658	57	57	57	57	57	57
Quad	percent	1658	36	36	38	42	51	74

Table 6
Model 2 specification: broker compensation impacts

YSP	Measure	Count	Average	Minimum	P10	Median	P90	Maximum
Dummy	dollar	1658	297	297	297	297	297	297
Linear	dollar	1658	970	29	234	779	1967	4992
Quad	dollar	1658	732	14	120	479	1643	6965
Dummy	percent	1658	34	3	8	20	68	552
Linear	percent	1658	53	53	53	53	53	53
Quad	percent	1658	35	25	33	33	45	74

The analysis of the differences between the Model 1 and Model 2 approaches suggest that the specification of the YSP variable, as well as the inclusion of particular explanatory variables, matters considerably to the results.

Our analysis of the YSP data prompted our additional analysis of the impact of changes in public policy regarding the use of YSPs. Specifically, we recognize that market outcomes may vary significantly across three distinct segments of borrowers: those borrowers who paid the entire mortgage broker compensation fee in the form of a yield spread premium, those who paid no yield spread premium and those whose closing costs were partially comprised of a yield spread premium (all, no, and some YSP, respectively). If these differences are not captured in the model, misspecification can result. In addition, we believe that marginal analysis of the type used to address the differences between models, as reflected in Tables 5 and 6, might not be the best measure of the impact of public policy changes. Rather, we examine the change

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in welfare, measured by the change in consumer costs resultant from a change in public policy. We describe our approach through the concept of the “parallel universe”.

The Parallel Universe – A Conceptual Experiment

The conceptual experiment we pose is designed to allow us to understand the impact of YSPs on individual classes of borrowers. We consider a world before the change in public policy pertaining to YSPs, with the world identical in all other aspects except for the proposed change. We then compare (average) consumer costs across the worlds before and after the policy change. This provides us with a marginal impact of the public policy change.

Implementing the public policy changes and measuring the impact after the policy change is difficult, as it requires forecasting market outcomes (changes in consumer costs) under circumstances that have changed fundamentally. Simplistically, we can think about those changes as affecting either supply or demand curves for mortgage products or services. On the demand side, consumers may value specific attributes of mortgages financed with YSPs (lower closing costs, transparency, ease of shopping) and these characteristics may change with the change in policy. On the supply side, there might be either fundamental cost differences or behavioral differences exhibited by suppliers before and after the policy change. Brokers, for example, may have greater incentives to seek cost efficiencies when closing costs are fully covered by YSPs than when they are not. Brokers may also have greater incentives or ability to extract rents from consumers in the presence of YSPs.

One approach would be to model all these potential impacts through specification of a structural model for which we could estimate equations and then use the changes in the structural model to predict policy impacts. We do not, however, use that approach here. Rather, we adopt a more data driven, reduced form approach. We hypothesize that each class of borrower might be differentially impacted by the explanatory variables and YSPs. To model these effects, we first account for observable characteristics by using statistical controls to estimate consumer costs. Using these estimates, we predict consumer costs as though all observations in the data were drawn from and evaluated as though they came from a particular segment of borrowers. We then

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simulate the impact of policy changes by making assumptions about the effect of the policy changes on consumer and broker behavior.

Specifically, we estimate three models, one for each class of borrower. Using the estimated coefficients from the following model, as j varies, we then predict the outcome over the full population of borrowers. Consumer costs are given by:

$$CC = \beta_1 X_1 + \dots + \beta_n X_n + \sum_j \chi_j (\beta_{n+1}^j X_{n+1}^j + \dots + \beta_m^j X_m^j) + \varepsilon$$

where $j = 1, 2, \text{ or } 3$, and depicts the class of borrower (all, no or some YSPs).

Our results are presented in Table 7 for consumer costs including YSP.⁸

Table 7: The Parallel Universe

Parameter	Estimate	Standard Error	t-value
Market: jumbo	1823.43	459.18	3.97
Dmbdisc	635.96	95.90	6.63
Loansize*drefi:0	3.01	0.28	10.72
Loansize*drefi: 1	2.52	0.28	8.95
Loansize*dthree: 0	-0.38	0.18	-2.09
Loansize*dthree: 1	---	---	---
Loansize*dfour: 0	-0.79	0.20	-4.02
Loansize*dfour: 1	---	---	---
Income	1.72	0.35	4.88
Fico (400-619)*all ysp	-689.36	508.43	-1.36
Fico (400-619)*no ysp	1404.57	2636.01	0.53
Fico (400-619)*some ysp	-105.49	262.00	-0.40
Fico (620-679)*all ysp	-1115.17	425.32	-2.62
Fico (620-679)*no ysp	-1898.21	842.67	-2.25
Fico (620-679)*some ysp	-231.83	213.59	-1.09
Fico (680-749)*all ysp	-1591.41	399.03	-3.99
Fico (680-749)*no ysp	-2476.79	784.26	-3.16
Fico (680-749)*some ysp	-838.03	193.73	-4.33

⁸ We analyzed specifications using consumer costs without YSP and net mortgage broker compensation as dependent variables but do not include that analysis here.

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Fico (750 and up)*all ysp	-1446.51	409.07	-3.54
Fico (750 and up)*no ysp	-2096.16	806.88	-2.60
Fico (750 and up)*some ysp	-842.53	198.82	-4.24
Fico (invalid)*all ysp	-1317.97	444.75	-2.96
Fico (invalid)*no ysp	-2136.11	850.09	-2.51
Fico (invalid)*some ysp	---	---	---
Ltvratio (10-80)*all ysp	-807.94	290.46	-2.78
Ltvratio (10-80)*no ysp	430.30	637.58	0.67
Ltvratio (10-80)*some ysp	-517.76	193.25	-2.68
Ltvratio (81-90)*all ysp	-564.40	318.05	-1.77
Ltvratio (81-90)*no ysp	993.61	700.28	1.42
Ltvratio (81-90)*some ysp	-517.91	207.25	-2.50
Ltvratio (91-97)*all ysp	-838.04	290.64	-2.88
Ltvratio (91-97)*no ysp	289.48	686.11	0.42
Ltvratio (91-97)*some ysp	-321.11	192.02	-1.67
Ltvratio (98 and up)*all ysp	---	---	--
Ltvratio (98 and up)*no ysp	---	---	---
Ltvratio (98 and up)*some ysp	---	---	---
Product (15-20 yr fixed)*all ysp	580.12	156.99	3.70
Product (15-20 yr fixed)*no ysp	339.86	395.78	0.86
Product (15-20 yr fixed)*some ysp	433.87	176.19	2.46
Product (30 yr fixed)*all ysp	855.15	135.79	6.30
Product (30 yr fixed)*no ysp	247.37	375.86	0.66
Product (30 yr fixed)*some ysp	318.86	158.12	2.02
Product (ARM)*all ysp	---	---	--
Product (ARM)*no ysp	---	---	---
Product (ARM)*some ysp	---	---	---
Loansize*all ysp	0.10	0.12	0.84
Loansize*no ysp	0.27	0.19	1.43
Loansize*some ysp	---	---	---
<i>R-squared: 0.43</i>			

Using these estimated coefficients, we control for differences in borrower characteristics and present the results for the three segments in Table 8.

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Table 8:
Mean YSPs by Consumer Segment

Segment	Raw Means	Means Controlling for Observables	Weights
No	4489	4241	12%
Some	4438	4500	57%
All	4105	4018	31%
Weighted Average	4341	4320	

The results in Table 8 show that accounting for observable differences has little impact on the segments with some or all YSPs, but significantly lowers estimated costs for those borrowers using no YSPs.

The differences seen in Table 8 above, as observed in the column of means controlling for observables, strongly suggest that important differences in unobserved consumer and broker behaviors exist among the market segments. For consumers, it is likely that there is some self-selection (or sorting) into the consumer segments based on financial sophistication. More sophisticated borrowers differentially may choose YSPs. This needs to be accounted for in comparing costs across markets. We also need to assess how this might change with the change in policy. For brokers, we allow for the possibility that brokers differentially treat borrowers by extracting more rents (charge higher fees) from those less financially sophisticated. Again, their ability differentially to extract rents might change with a change in public policy.

Public Policy Impacts Given the Parallel Universe Experiment

We now turn to the analysis of the two public policies under recent consideration. First, we consider the impacts from elimination of YSPs and then we consider the impacts from increased transparencies in the mortgage settlement process. The elimination of YSPs implies that there remains no self-selection (or sorting) of borrowers across segments and also implies that broker behavior becomes equivalent to that observed in the case of no YSPs. Unfortunately, we cannot determine without further analysis which of the differences we observe

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in Table 8 result from self-selection and which result from differences in broker treatment across the market segments. If we assume that all of the differences in Table 8 result from sorting by borrowers, elimination of YSPs suggests that borrowers save, on average, approximately \$20. This result is calculated by measuring the differences in weighted means before and after controlling for observables ($4341 - 4320 = 21$). If we instead assume that the differences in Table 8 are due entirely to broker differential behavior, then elimination of YSPs implies that borrowers save, on average, approximately \$80. We calculate this result by looking at the weighted difference in means by moving from either some YSPs or all YSPs to no YSPs [$.57(4500 - 4241) + .31(4018 - 4241) = 79$]. Elimination of YSPs does not, on average, significantly improve consumer welfare. Even though one segment of the market is disadvantaged by the use of YSPs (some YSPs), another segment (all YSPs) benefits from the use of YSPs in the mortgage settlement process. However, elimination of YSPs could confer significant benefits on some individual borrowers who face considerably higher consumer costs with YSPs than do most.

Next we consider the benefits to consumers of increased transparencies in the mortgage settlement process. This change would have the advantage of increasing consumer welfare for borrowers currently disadvantaged by YSPs (those with some YSPs) without necessarily imposing costs on those who currently benefit from YSPs (those with all YSPs). Under the increased transparency, sorting remains possible, as does differential broker behavior across the market segments. At the extreme, we can consider the impact of giving everyone the costs predicted in the all YSP case. This results in borrowers saving, on average, approximately \$320 ($4341 - 4018 = 323$).

Controlling for Unobserved Variation

In the analysis above, we took a simplistic approach to addressing unobservable consumer and broker behavior. These unobservable differences across and within the three segments will play an important role in determining consumer costs with YSPs and can affect the outcomes of public policy changes. Ongoing research is designed to better model these behaviors. First, we plan to expand our set of explanatory variables to capture some of the

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socioeconomic factors that may be correlated with borrower or broker behavior such as tract level education, income, and occupation as well as industry concentration. We will also expand our analysis of the residuals (errors) to account for these unobservable differences.

We recognize that the results from our estimated model reflect, in part, omitted variables or unobserved effects, possibly due to borrower or broker behavioral differences across the segments not accounted for by the set of explanatory variables we are able to use for the estimation. We hypothesize that these “unobserved” effects could be partially modeled through the addition of an additional compound error term. We model the effect of the unobserved variables (reflecting financial sophistication and other factors) through three differential error terms. The first error term is the normally distributed error term reflecting idiosyncratic differences across borrowers. The second and third error terms reflect the differential borrower (self-selection) or broker (rent extraction) behaviors. The third error term also reflects the impact of large outliers and can represent cases for which there remains a large, positive, unexplained component in the estimation of consumer costs.

Formally, we model the unobserved effects through the use of a three part error structure given as follows: $\varepsilon = \nu + |\mu| + \eta$ where $\nu \sim N(0, \sigma_\nu^2)$ and $\mu \sim N(0, \sigma_\mu^2)$ and $\eta = Bin(\rho) \times (d + Exp(\theta))$ where N represents a normal distribution, Bin a binomial distribution and Exp the exponential distribution and d is set to 3000.⁹

Finally, we recognize that if there are differences in the three classes of borrowers, either indicated by differences in the parallel universe or compound error cases, then the participants in the mortgage process, lenders or brokers, might be able differentially to extract rents from the borrowers. One explanation for this might be that one class of borrower is less financially sophisticated, more naïve, or has less ability to bargain due to a less competitive environment in the area in which they reside. As mentioned earlier, our analysis to account for these across-segment differences utilizes the construct of predicting consumer costs separately for the individual segments, including YSPs as an explanatory variable, and then calculating the resulting change in consumer costs from setting the explanatory YSP variable equal to zero.

⁹ The value of 3000 defines the level above which we expect that the normal and half normal error terms cannot explain the observed frequency of outcomes.

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The mean of this ‘rents’ error will be captured in the regression coefficients of the equation, and consequently will be imbedded in the results of Table 8. For example, if the rents were non-stochastic and varied by segment, then these rents would be captured by the differences in the intercepts across the three regressions.

Preliminary method-of-moments estimation of this framework suggests that the estimated rents for the some and no YSP segments are about twice that of the all YSP case. Moreover these rents appear to disproportionately enter through large outliers. We expect to further refine our analysis within each segment to better capture the nature of this effect.

Conclusions

In this paper, we have assessed the implications on consumer costs of changes in public policies regarding YSPs. In our analysis, we expand on the previous research in this area by focusing on consumer costs rather than net mortgage broker compensation; by dividing borrowers into three segments (some, all, and no YSPs); and by considering the discrete impact of public policy changes. We find that, in the raw data, all YSP borrowers, on average, have lower costs than those borrowers with no or some YSPs. Simple comparisons of costs across these segments are, however, problematic. In particular, cost differences may not simply reflect differential benefits and costs of YSPs but, instead, may be a function of observable factors that directly determine closing costs (e.g. loan size) and unobservable consumer and broker behaviors that differentially impact the market segments.

Controlling for observable factors, we find a story different than that reflected in the raw data. Specifically, the all YSP segment of borrowers bears the lowest consumer costs but the some YSP segment of borrowers are now seen to pay costs significantly higher than those borrowers with no YSPs. The fact that controlling for observables does not equate costs across segments implies that there is an important role played by unobservable consumer or broker behavior. Our belief is that the low cost of the all YSP segment reflects the fact that this market segment disproportionately is chosen by financially sophisticated borrowers. The high cost borne in the some YSP segment likely reflects a lack of borrower financial sophistication as well as, possibly, differential broker behavior resulting in the extraction of additional rents from this segment.