Code and Data

1. Eviews
   * 1. Panel of rates by FICO, LTV, Documentation used for imputation regression
     2. 2005 and 2013 differences in premiums, mispricing, and shares for Section 3 regressions
2. Gauss
   * 1. Code for estimating parameters of conditional default function from 2013 PMI data, applied to 2005 and 2013 composite FHA/PMI premiums to compute mispricing
3. Excel
   * 1. Annual data on premiums and product shares, formulas for constructing price indexes and computing mispricing in 2005 and 2013
     2. PMI and FHA premium data by product, monthly and quarterly

**EViews Code and Data**

Table 7  
OLS1: ls dsharet c dprem-dpstar dpstar

OLS2: ls dsharet c dprem-dpstar dpstar (fico<640)

OLS3: ls dsharet c dpstar dpstar\*(ltv>95) dprem-dpstar (fico<640) (fico<640)\*(ltv>95)

IV: tsls dsharet c dpstar dpstar\*(ltv>95) dprem-dpstar (fico<640)\*(ltv>95) (fico<640)

@ c dprem\*(ltv<97) dprem\*(ltv>95) ltv fico ltv^2 fico^2 ltv/fico (ltv>95) (fico<640) (fico<640)\*(ltv>95)

Data in Table7Data.xlsx

Table 8

Mispricing: share2005\*exp(-1.127441\*(dprem-dpstar))

Optimism: share2005\*(exp(-4.834\*(ltv<97)\*(dpstar-0.22895))+(ltv>95)\*(-1.593\*(dpstar-0.22895)))

Combined: share2005\*exp(-1.127441\*(dprem-dpstar)-4.834\*(ltv<97)\*(dpstar-0.22895)-1.593\*(ltv>95)\*(dpstar-0.22895))

Results are sums of the above values by risk category (low, medium, high, veryhigh)

Coefficients come from regression model OLS3.

Data in Table8data.xslx

Table A2

Estimated equation is:

xlpmi=c(1)+c(2)\*(minfico-760)+c(3)\*(minltv-70)+c(4)\*(minfico-760)^2+c(5)\*(minltv-70)^2+c(6)\*(minltv-70)\*(minfico-760)+c(7)\*(minfico-760)^3+c(8)\*(minltv-70)^3+c(9)\*lowdoc+c(10)\*(year=2007)\*(minfico-760)+c(11)\*(year=2007)\*(minltv-70)+c(12)\*(year=2008)\*(minfico-760)+c(13)\*(year=2008)\*(minltv-70)+c(14)\*(year=2009)\*(minfico-760)+c(15)\*(year=2009)\*(minltv-70)+c(16)\*(year=2010)\*(minfico-760)+c(17)\*(year=2010)\*(minltv-70)+c(18)\*(year=2011)\*(minfico-760)+c(19)\*(year=2011)\*(minltv-70)+c(20)\*(year=2012)\*(minfico-760)+c(21)\*(year=2012)\*(minltv-70)+c(22)\*(year=2013)\*(minfico-760)+c(23)\*(year=2013)\*(minltv-70)+c(24)\*(year=2014)\*(minfico-760)+c(25)\*(year=2014)\*(minltv-70)+c(26)\*(year=2015)\*(minfico-760)+c(27)\*(year=2015)\*(minltv-70)+c(28)\*(year=2016)\*(minfico-760)+c(29)\*(year=2016)\*(minltv-70)+c(30)\*lowdoc\*(minfico-760)+c(31)\*lowdoc\*(minltv-70)+c(32)\*lowdoc\*(minfico-760)\*(year>2007)+c(33)\*lowdoc\*(minltv-70)\*(year>2007)+c(34)\*lowdoc\*(minfico-760)^2+c(35)\*lowdoc\*(minltv-70)^2+c(36)\*lowdoc\*(minfico-760)^3+c(37)\*lowdoc\*(minltv-70)^3+c(38)\*lowdoc\*(minltv-70)\*(minfico-760)+c(39)\*lowdoc\*(minfico-760)\*(year=2007)+c(40)\*lowdoc\*(minltv-70)\*(year=2007)+c(41)\*(year=2002)\*(minfico-760)+c(42)\*(year=2002)\*(minltv-70)+c(43)\*(year=2003)\*(minfico-760)+c(44)\*(year=2003)\*(minltv-70)+c(45)\*(year=2004)\*(minfico-760)+c(46)\*(year=2004)\*(minltv-70)+c(47)\*(year=2005)\*(minfico-760)+c(48)\*(year=2005)\*(minltv-70)+c(49)\*(year=2006)\*(minfico-760)+c(50)\*(year=2006)\*(minltv-70)+c(51)\*(year>2001)\*(minfico-760)^2+c(52)\*(year>2001)\*(minfico-760)^3+c(53)\*(year>2001)\*(minltv-70)^2+c(54)\*(year>2001)\*(minltv-70)^3

Method: Panel Least Squares

Data in ImputeData.xlsx

**Gauss Code**

Kahnkayfit2c.gss: Fits parameters of default/repayment function to 2013 PMI premiums to generate “fundamental” premiums for 2005. Requires Gauss libraries pgraph, optmum, nlsysmt.

Intquad\_dxdy.gss: Computes a definite integral of a function f(x,y), integrating over x only, resulting in a function g(y), an indefinite integral with respect to y.

**Other Excel Files**

**1. Mortgage\_Pivot\_Tables\_for\_JMCB.xlsx**

This file is used to create the mortgage insurance price indexes shown in

**Tabs**

* **FHA and PMI weighted average index:** This tab computes the price index for the combined PMI and FHA price index. The weights correspond to the annual mortgage insurance premium (the composite of PMI and FHA premiums weighted by the share of each) for each product (the premium x dollar value of mortgages). Source of bottom panel of Figure 3.
* **PMI-only Price Indexes**: As above but only for private mortgages. Source of top panel of Figure 3.
* **Yearly Pivot Tables (FHA)**: Government-insured mortgages by product, used for the Market Shares by Risk tab.
* **Flat Table Pivot:** Underlying data on dollar volume of mortgages (private and FHA) for calculating product shares.
* **Market Shares by Risk:** Data for Figure 4.
* **Graphics:** Figures based on computations in the other tabs.

**2. PMI\_Data\_Pivot\_JMCB.xlsx**

This file contains the raw PMI data, tabulated monthly, quarterly and annually.

**Tabs**

* **Monthly:** Original PMI data, tabulated monthly, noting the start date of the corresponding rate sheet and the mortgage insurer (“fill” indicates the earlier premium was assumed to remain in effect until the next rate sheet took effect).
* **Monthly no blanks:** Same as monthly but with blank entries removed.
* **Monthly Pivot:** Pivot table of premiums by FICO, LTV, and documentation level based on the Monthly tab
* **Annual Pivot:** Pivot table of premiums by FICO, LTV, and documentation level aggregated to annual (averaging over monthly)

**3. 2005\_2013\_Regression\_Data\_for\_JMCB**

This file is used to compute the differenced data for the regressions in Table 7, as well as various statistics by risk group such as average mispricing, average changes in premiums, etc.

**Tabs**

* **2005:** Premiums and dollar values of mortgages by FICO and LTV ranges, computations of product shares, mispricing, and statistics by risk category, for the year 2005
* **2013:** Like tab 2005 except for 2013
* **Compare:** Computes changes from 2005 to 2013 of mispricing, premiums, product shares
* **Compare PMI only**: Like tab Compare, but restricting premiums and shares to privately insured mortgages