

*Identifying & Managing
Technology Risks
“Automated Valuation Models”*



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The Case for Valuation Technology



- More educated consumers demand better, faster service.
- Artificially high cost of loan origination conflicts with affordable housing initiatives.
- Technology makes it possible to provide better more consistent valuation methods.
- Improved data collection, manipulation, understanding and coverage.

Mortgage Change Drivers



- The internet is supporting an increase in Speed and Capacity
- Industry consolidation is fueling competition and driving process change
- Acceptance of credit scoring models is separating objective decisions from subjective decisions

Mortgage Change Drivers



- Confidence in appraisal quality is declining
- Brokers originating more and more
- Cost of an appraisal is increasing: appraisal, review, QC, audit, portfolio
- Integration of *current* AVM's raises new issues and concerns

Inhibitors to Technology Adoption



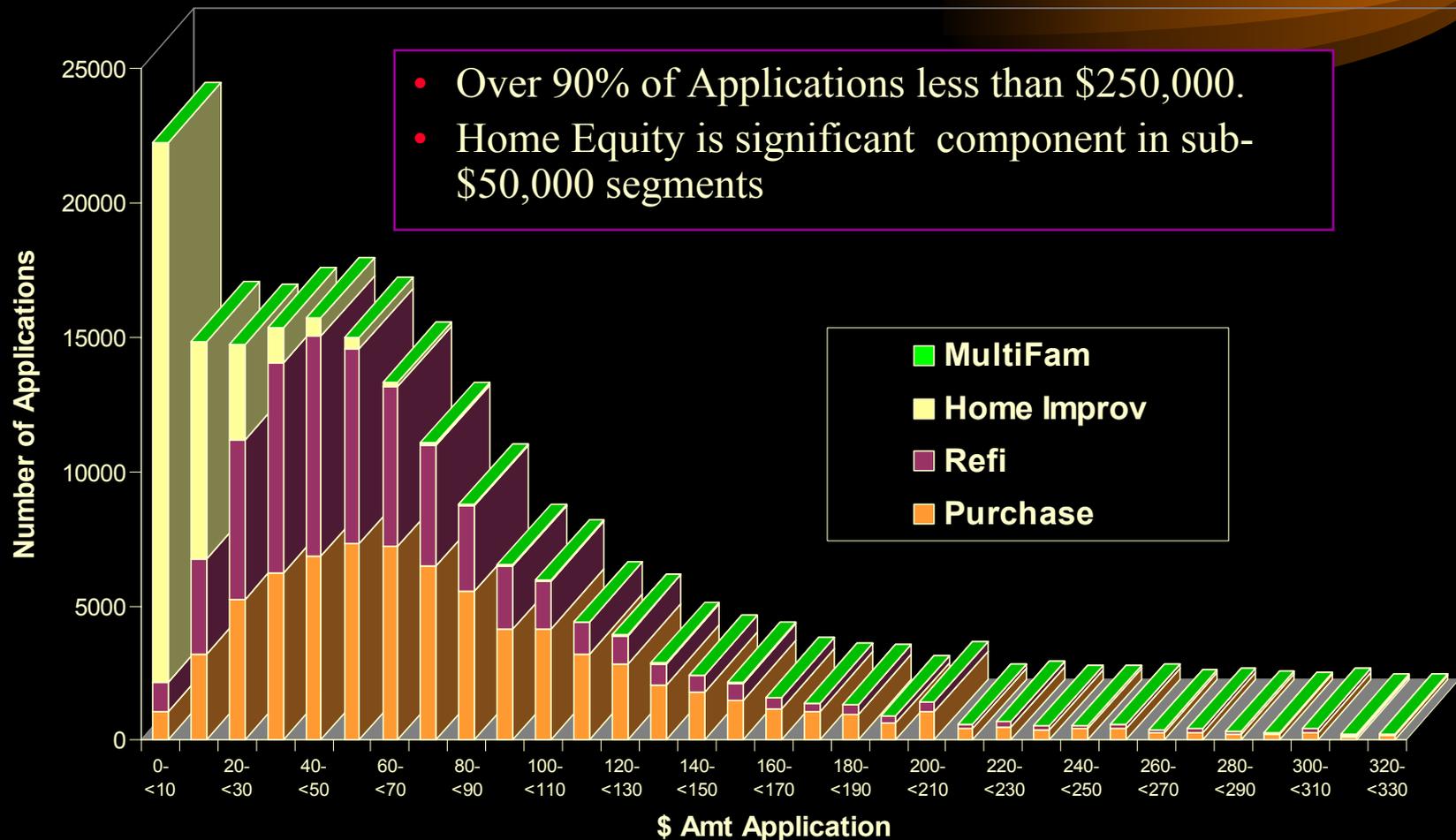
- Industry highly fragmented
- Size and concentration of technology suppliers
- High degree of dependence on “traditional Values” and “working culture”
- A general aversion top change
- Most information on technology acquired from vendors

What can be done with AVMs?

- Applicant pre-screening
 - Appraisal review
 - Loss Mitigation /REO
- Bulk portfolio / reserve analysis
 - Streamlined refi products
 - Home Equity
 - First Mortgages

Application	Traditional	AVM	Comments
Pre qualification	Manual Comp search	AVM	AVM faster than manual search to compare to owners estimate of value
1 st Mortgage (Purchase)	1004, 2055, 2065 Appraisals	AVM w/inspection And/or analysis of output by appraiser	Depending on LTV. Hybrid AVM with some appraiser involvement. Need to set policy on AVM variance from sales price accepted.
1 st Mortgage (refi)	1004, 2055, 2065 Appraisals	AVM w/inspection and/or analysis or AVM appraisal	Depending on LTV and cash out basis determines degree of appraiser involvement. Need to create policy matrix.
2 nd Mortgage HELOC	2055,2065 Appraisals, BPO's	AVM w/or w/out inspection	Depending on total LTV and loan amount.
2 nd Mortgage -125%	BPO's Desktop valuations Assessed values	AVM	AVM provides better consistency of valuations if known accuracy rates. Use traditional when no hit available.
QC/Appraisal Review	Review Appraisals Desktop or Field	AVM w/or w/out appraiser involvement	Much higher percentage can be reviewed with AVM. Only an appraiser reviews those outside policy guidelines.
Loss Mitigation	Appraisal Reviews BPO's 2065,2055	AVM w/inspection	AVM improves speed and efficiency. Inspections by broker and appraiser can concentrate on conditional variances in value.
Portfolio Analysis	Appraisal reviews BPO's	AVM	Very small % typically reviewed. AVM allows for broader coverage at less cost and faster.

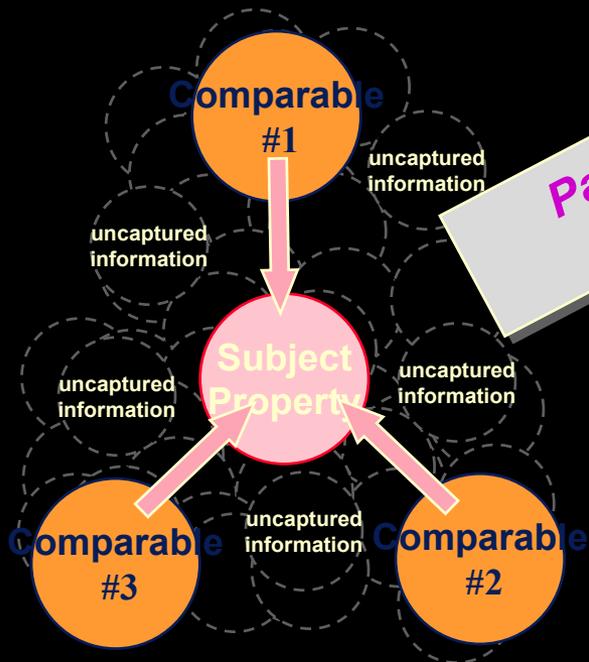
Over 90% of loan applications fall within federal evaluation guidelines



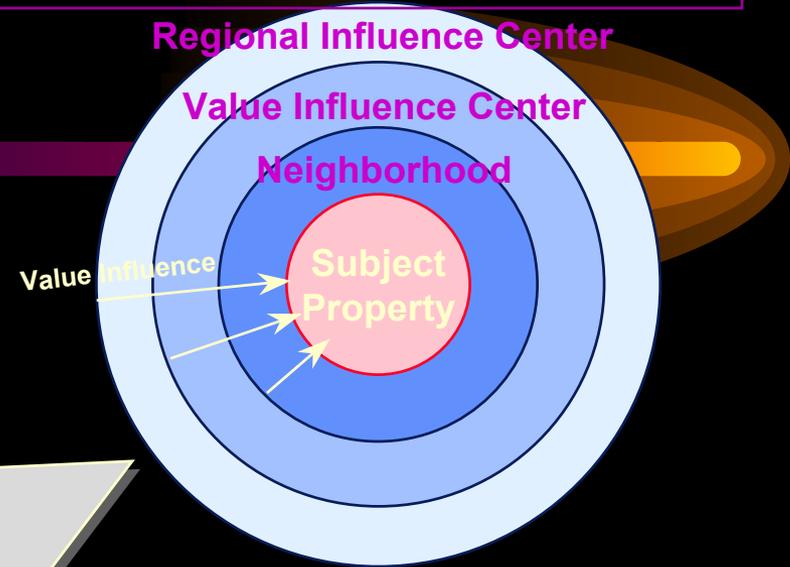
Improving on the Traditional Appraisal

Sales Comparable Approach

- **Information-inefficient**: estimate derived from small representative sample. Most data thrown away.
- **Sample highly localized**



Paradigm Shift

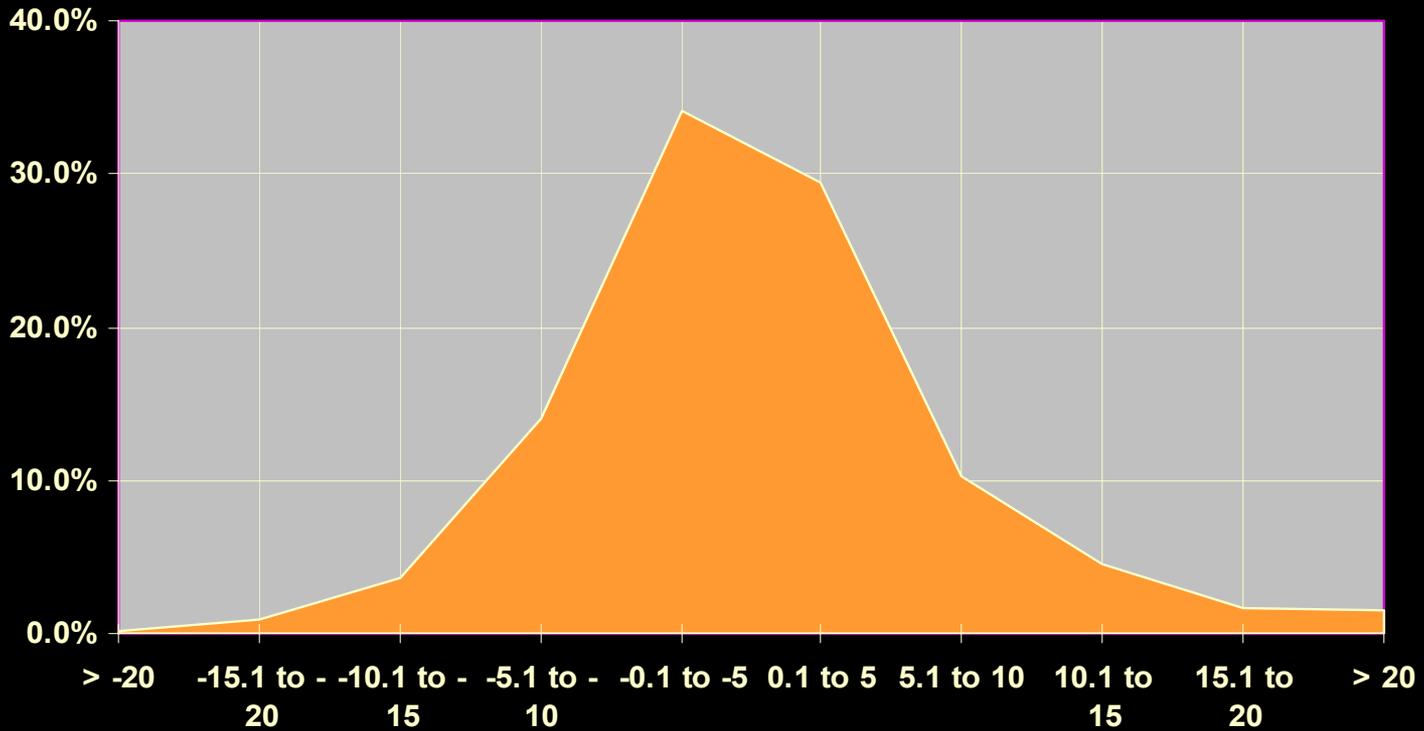


AVM Influenced Appraisal

- Provides a **more efficient** analytical framework
- **Retains strengths** of the traditional valuation approach
- **Incorporates more information** from a wider geographical scope
- **Large cost and time savings**

AVM Test Results

Sales Price vs. Estimated Value



AVM Types



- **Hedonic Models**
 - Property Specific (Location dependent)
 - Requires Characteristic data on subject and comparable data
 - Typically provides justification
 - Statistical evaluations
 - Rules-based systems
 - Neural Nets

AVM Types



Price Indexes

- Price specific
- Requires Sales Data only, no characteristics.
- Applies regression to a “repeat sales” analysis
- Makes numerous assumptions
- Typically does not provide justification
- Needs previous price point to run

Shopping for an AVM

Asking the right questions

- What type? Data source? Coverage? Test?
- Where do I do business geographically?
- Application- When do I use an AVM?
- Which AVM is matched to my risk level?
- Do I need more than one AVM?

Shopping for an AVM

Asking the right questions

- Deployment - Who uses it? Why? Training?
- Do I outsource?
- Policy/Underwriting Guidelines:
How do I incorporate the results?
- Who interprets the results?
- What do my investors want to know?
- Corporate policy vs. Field operations:
Are they affected? How?

Who is the AVM/Valuation guru?

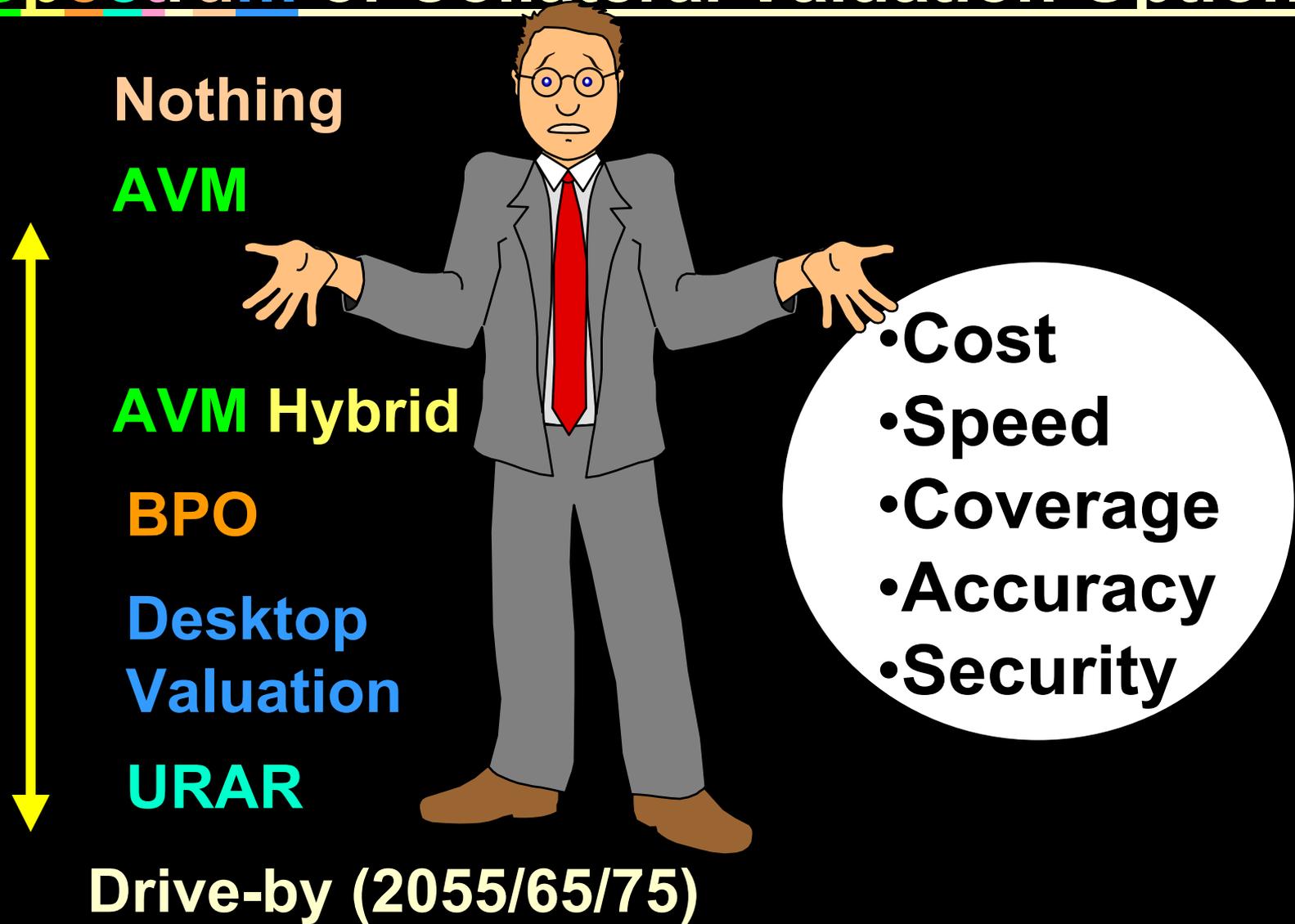
- Chief Appraiser
- Chief Underwriter
- CIO
- Credit Manager
- If an institution does not have one, create or find one.

Collateral Valuation Matrix



- Review current collateral valuation guidelines & procedures
- Examine geographic coverage
- Create test file for fit and accuracy
- Incorporate AVMs and Hybrids
- Develop application and implementation process
- Engage modelers to find “Best in Class”

A Spectrum of Collateral Valuation Options



What's the catch?

- Not right for all applications
- Data degradation
- Discouraging “hit rates”
- They don't “Hit the Number!”
- Still a need for ongoing QC
- No existing standards

Industry Issues with AVM's

- Guidelines, Standards, Policies, Procedures
- Data
 - 10 states are non-disclosure
- Law and Regulation
 - 28 states have mandatory licensing laws
 - 14 states have laws limiting BPO's
 - 17 states have laws effecting Home Inspections
 - HUD has new appraisal guidelines

Industry Issues with AVM's



- Defining accuracy of models:
 - What's good enough?
 - How accurate are traditional products?
 - AVM testing sets new bar over traditional valuations
 - Confidence scores difficult to interpret
 - Errors are unbiased

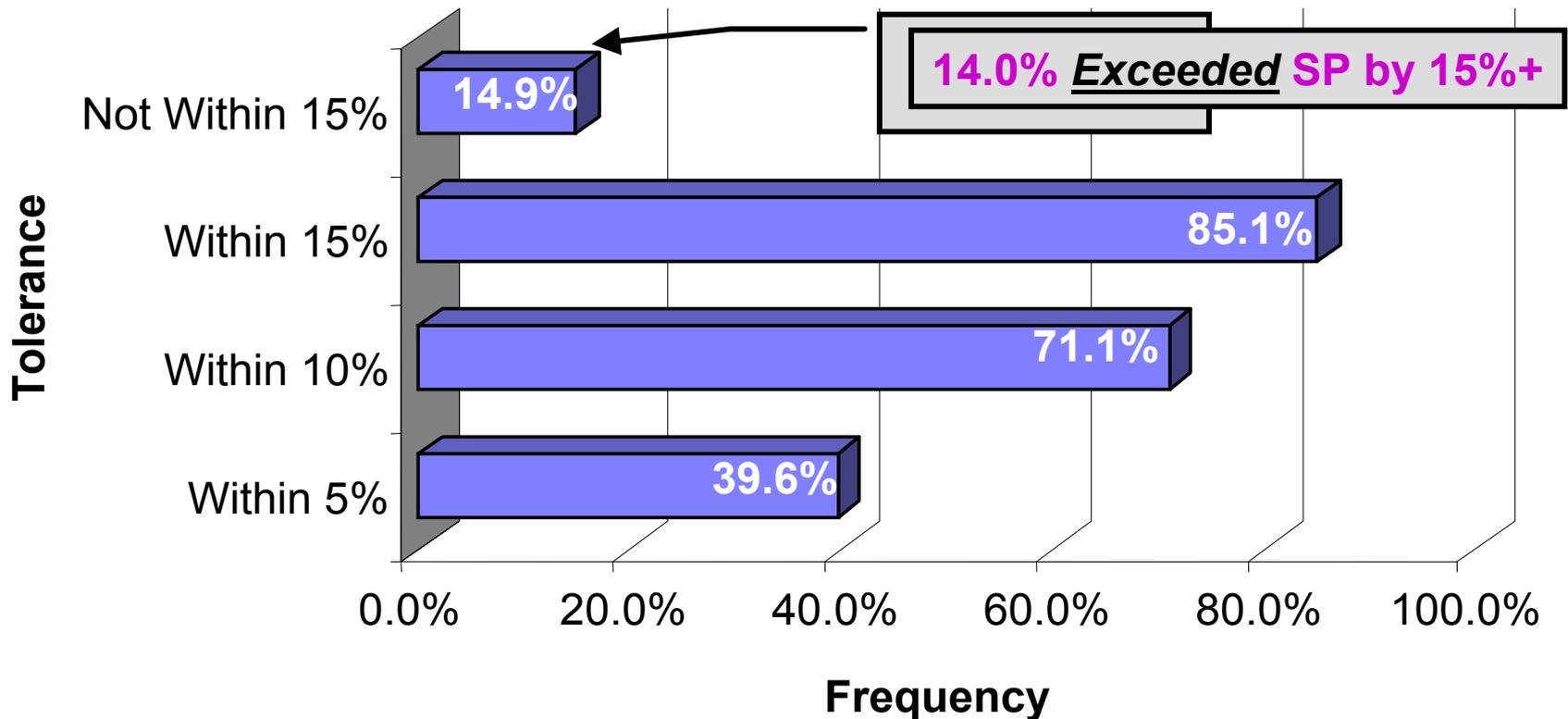
AVM Classification System

Classification	Specific Accuracy	Valuation Rate	Aggregate Accuracy	Coverage Area	Justification
Level I	Up to 7% 80% w/10%	min of 40% W/o user	Up to .6%	Min of 40%	Actual 100%
Level II	Up to 10% 70% w/10%	Min of 50% W /o user	Up to 1.1%	Min of 50%	Implied 100% or Actual greater than 50%
Level III	Up to 13% 60% w/10%	Min of 70% W /user	Up to 2.1%	Min of 60%	Implied 50%minimum
Level IV	Up to 16% 50% w/10%	Min of 80% W /user	Up to 3.1%	Min of 70%	None

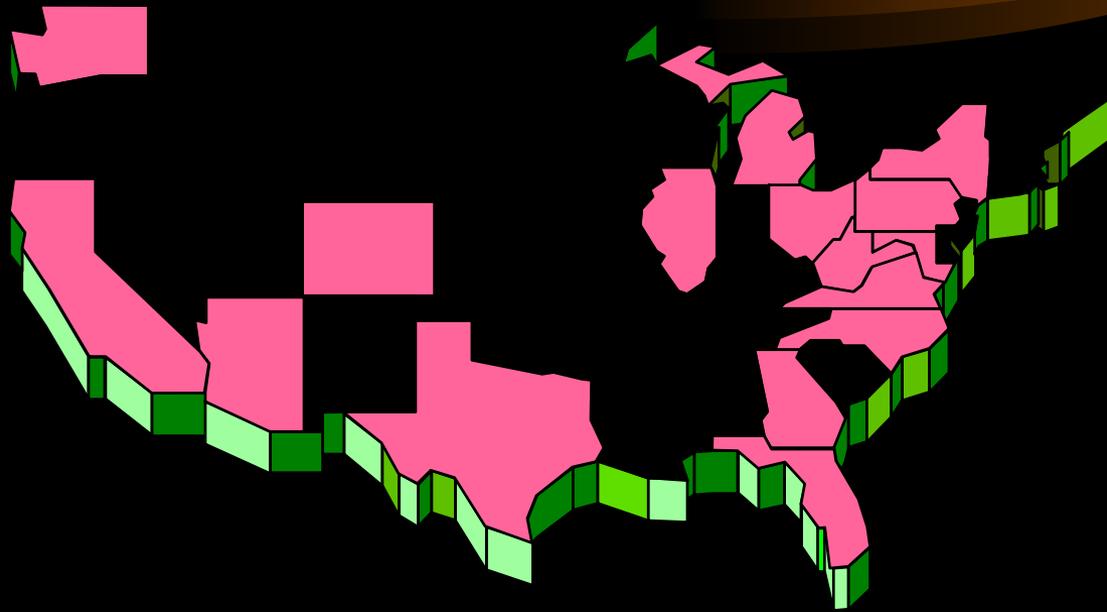
REFINANCE APPRAISALS

HOW ACCURATE ARE THEY?

MARKET-ADJUSTED REFI APPRAISALS vs. SALE PRICES



Fifteen States Comprise 71% of Total Mortgage Originations

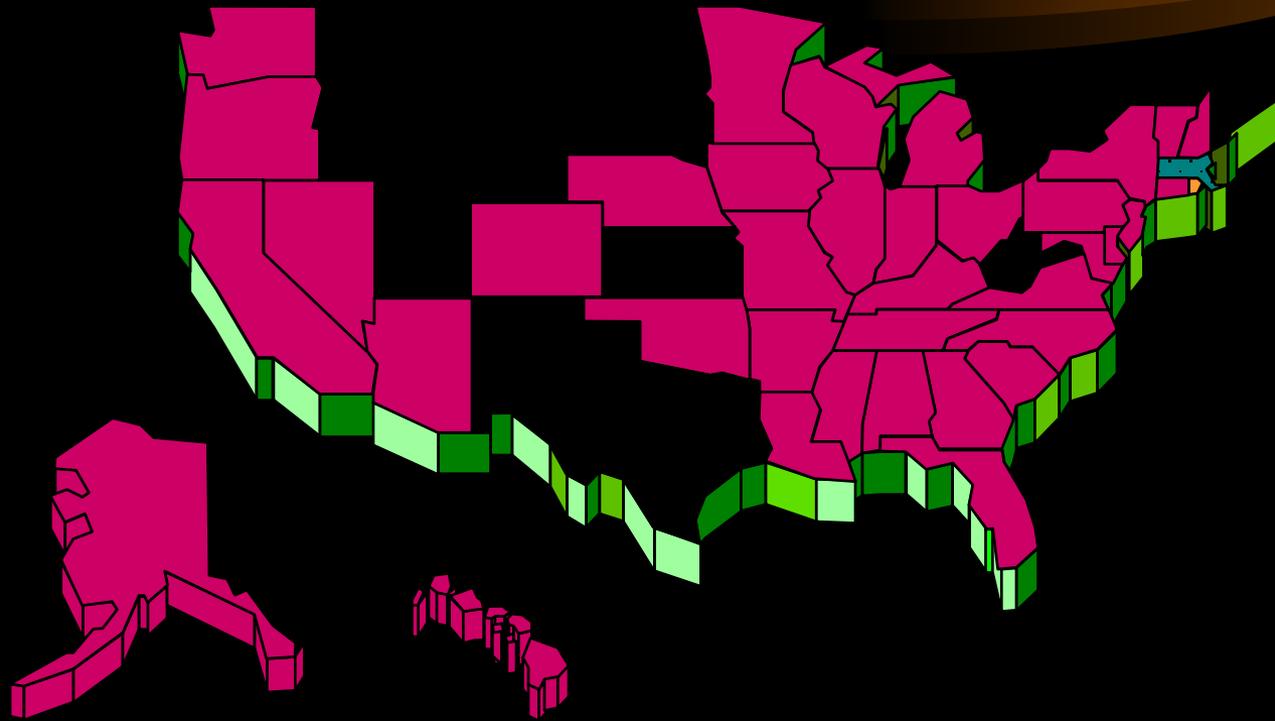


Source: Mortgage trust deed recordings collected by Experian.

Hedonic Coverage Today



Index Model Coverage Today



Appraisal Fraud



- Residential Valuation fraud rapidly increasing
- “Flipping” is most predominant fraud activity
- Traditional valuation methods are very prone to fraud
- 80% of the time Appraisers are unknowing participants

Flip Dissected!



- Property is listed for sale at market value by homeowner.
- “Bad Guy” buys property at market value from unwitting homeowner, then re-sells property at a much higher price (often to a “straw buyer”) and obtains a large loan from lender.
- After loan funds, “Bad Guy” and straw buyer walks from the property, leaving the lender “upside down”.

How do they do it?



- “Straw Buyers” – Individuals representing themselves as real buyers, but are in on the deal.
- Identity theft- Individuals pretending to be someone else, using their good credit and income verification.
- “Inside job”- Mortgage company, escrow and title manipulate transactions. Duplicate deals.

Los Angeles., CA

3BD/2BA

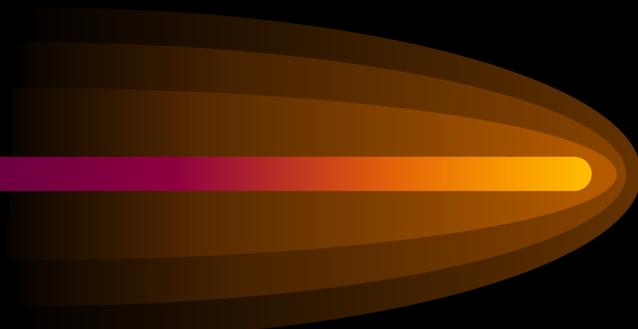
1802sf

- 07/19/96 REO Purchase \$262,000
- 10/21/97 List Price \$385,000
- 01/22/98 Amended List Price \$375,000
- 05/02/98 Purchase Contract \$370,000
- 07/27/98 Closed Escrow \$370,000
- 08/18/98 List Price \$625,000
- 08/31/98 Purchase Contract \$622,000
- 09/04/98 Appraisal \$622,000
- 12/03/98 Closed Escrow \$622,000
- 12/03/98 Trust Deed \$495,000

Riverside, CA

4BD/3BA

1909sf

- 
- 12/22/98 List Price \$175,000
 - 04/01/99 Amended List Price \$170,000
 - 05/01/99 Amended List Price \$167,500
 - 05/10/99 Purchase Contract \$165,000
 - 05/13/99 Appraisal \$412,000
 - 06/25/99 Closed Escrow \$165,000
 - 06/25/99 Concurrent Escrow \$412,000
 - 06/25/99 Trust Deed \$326,000

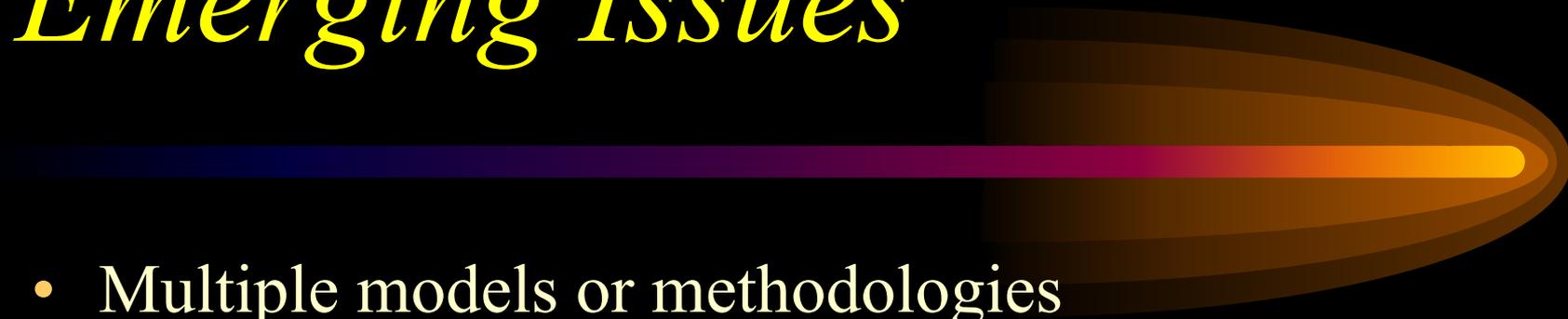
Riverside Property



AVM Analysis of Fraud Cases

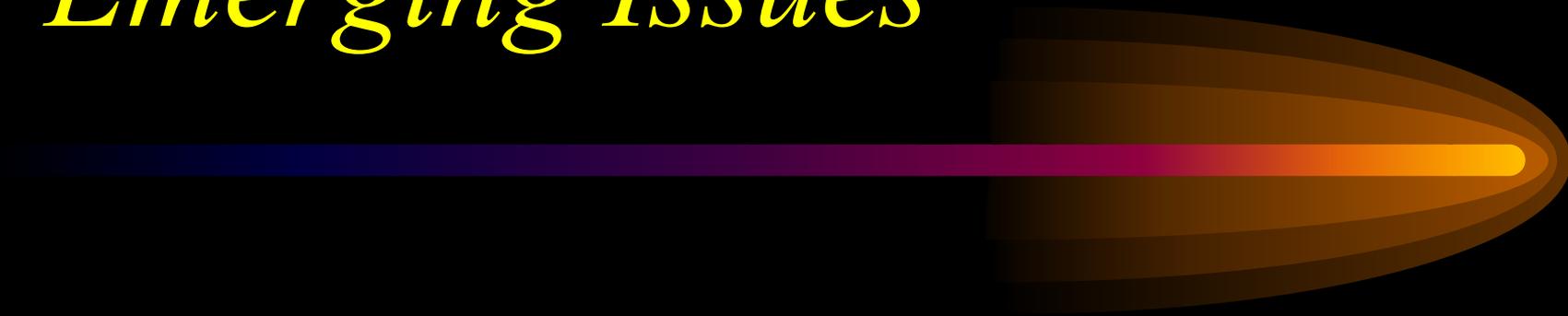
	Model A	Model B
Los Angeles \$370,000 actual \$622,000 flip	\$370,000	\$465,000
Riverside \$165,000 actual \$412,000 flip	\$167,000	\$159,000

Emerging Issues



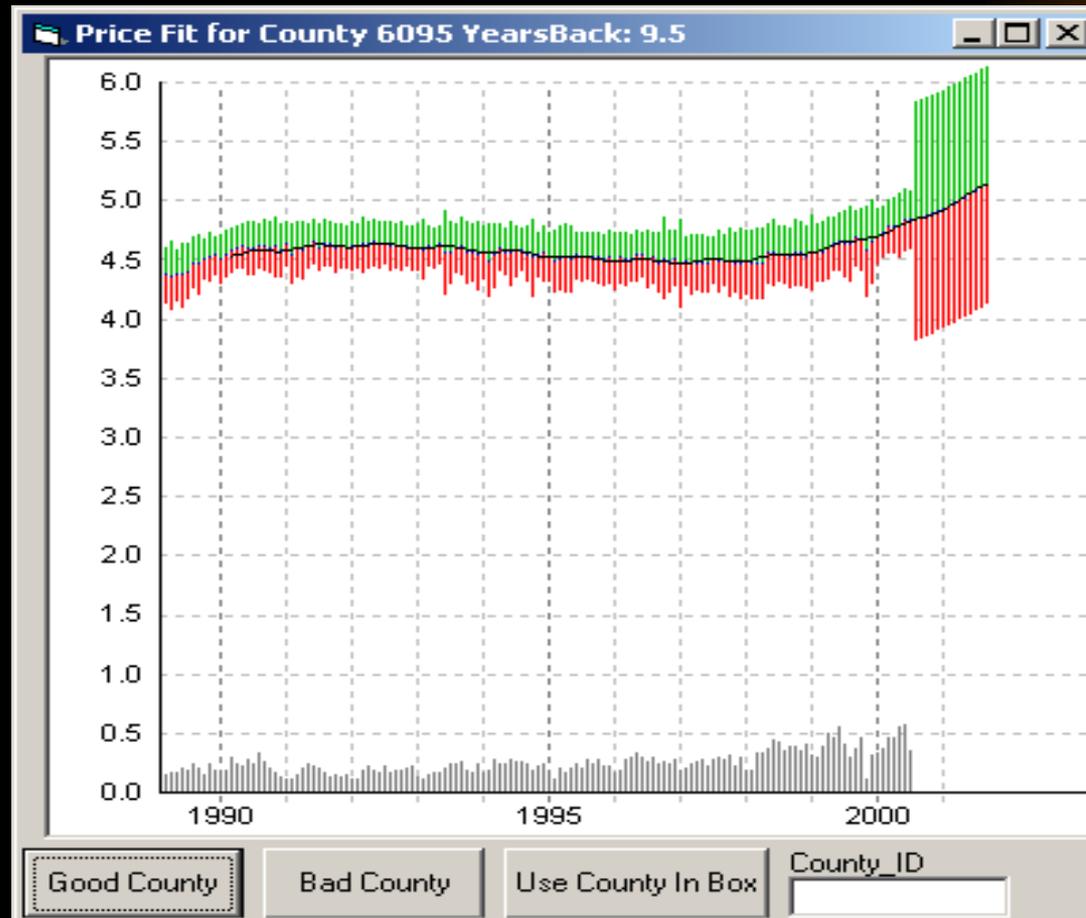
- Multiple models or methodologies
- Improving the data:How, Who, When!
- Valuation Warranties (Yes or No)
- Collateral Score
 - What is it?
 - What information should it consider?
 - Does it include the value?
 - How is it integrated with a credit ?

Emerging Issues



- Risk Based Pricing
- Collapse of 100%LTV protection
- Overhauling Collateral Assessment Theories or Redefining the process
- Understanding true market dynamics
- Collateral Assessment must become part of a business decision

Price CurveFit for Solano, CA



THE FUTURE IS HERE: This is the result of a response surface model used to make the location adjustment in Dade County's real property valuation model.

