7 Deadly Frictions in Subprime Mortgage Securitization

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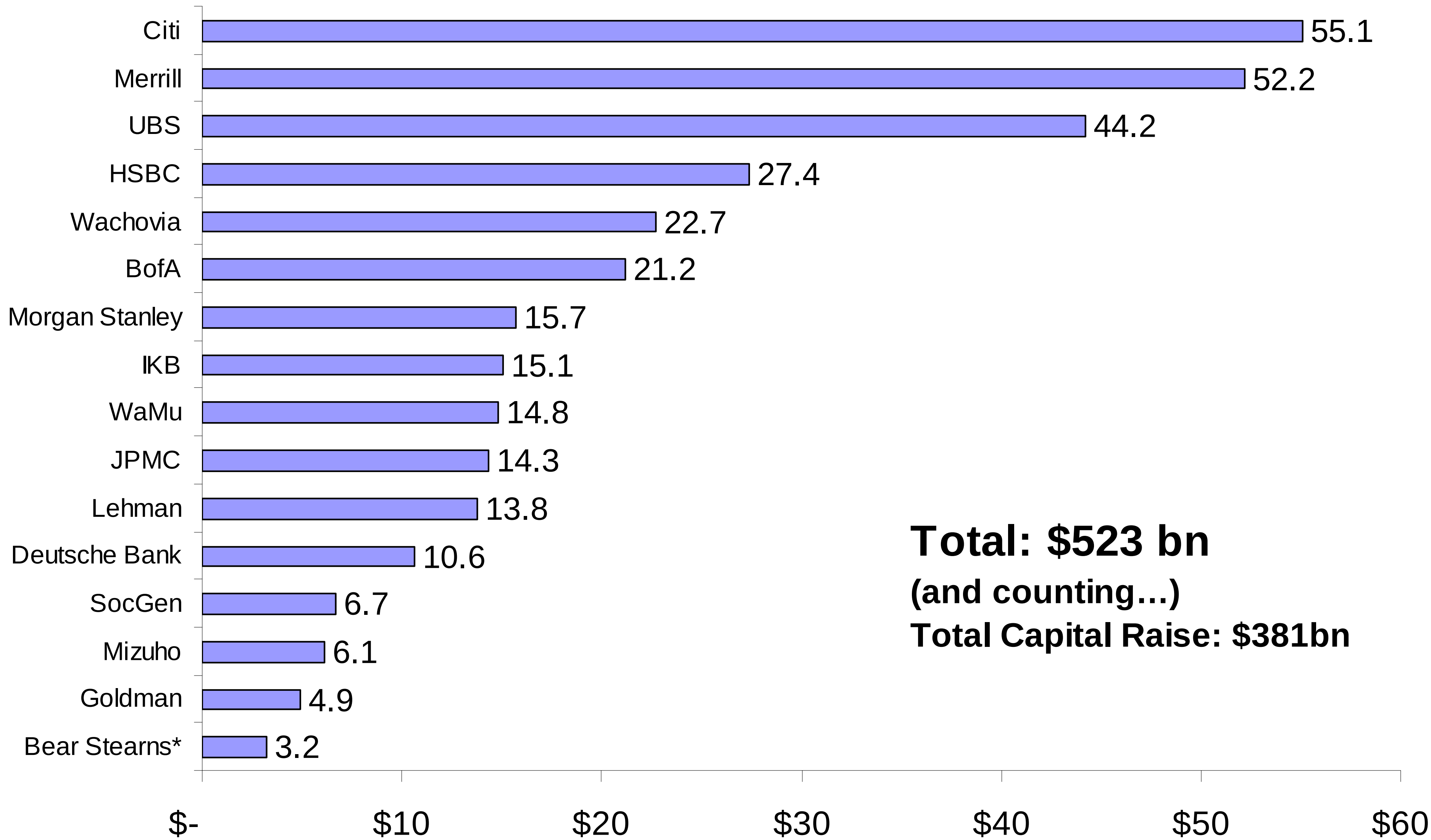
FRBNY Research

Q-Group, October 2008

Bank Write Downs

billions; through September 25, 2008



Source: Bloomberg

I. Example deal from New Century

- GSAMP 2006-NC2

2nd largest subprime lender 2004-2006

Filed for bankruptcy April 2007

3949 subprime loans

$881 million principal

originated 2006:Q2

New Century Financial
Originator
Initial Servicer

Goldman Sachs
Arranger
Swap Counterparty

GSAMP Trust 2006-NC2
Bankruptcy-remote trust
Issuing entity

Moody's, S&P
Credit Rating Agencies

Ocwen
Servicer

Wells Fargo
Master Servicer
Securities Administrator

Deutche Bank
Trustee

Mezz tranches downgraded severely in historical rating action by Moodys in July 2007

GSAMP 2006-NC2 original and current credit ratings

SP		Moodys	
Original	**Current**	**Original**	**Current**
AAA	AAA	Aaa	Aaa
AAA	AAA	Aaa	Aaa
AAA	AAA	Aaa	Aa1
AAA	AAA	Aaa	Aa2
AAA	AAA	Aaa	A1
AA+	AA	Aa1	Baa3
AA	BB	Aa2	B2
AA-	B	Aa3	B3
A+	CCC	A1	Caa1
A	CCC	A2	Caa2
A-	CCC	A3	Caa3
BBB+	CCC	Baa1	Ca
BBB	CCC	Baa2	C
BBB-	CC	Baa3	C
BB+	CC	Ba1	C
BB	CC	Ba2	C

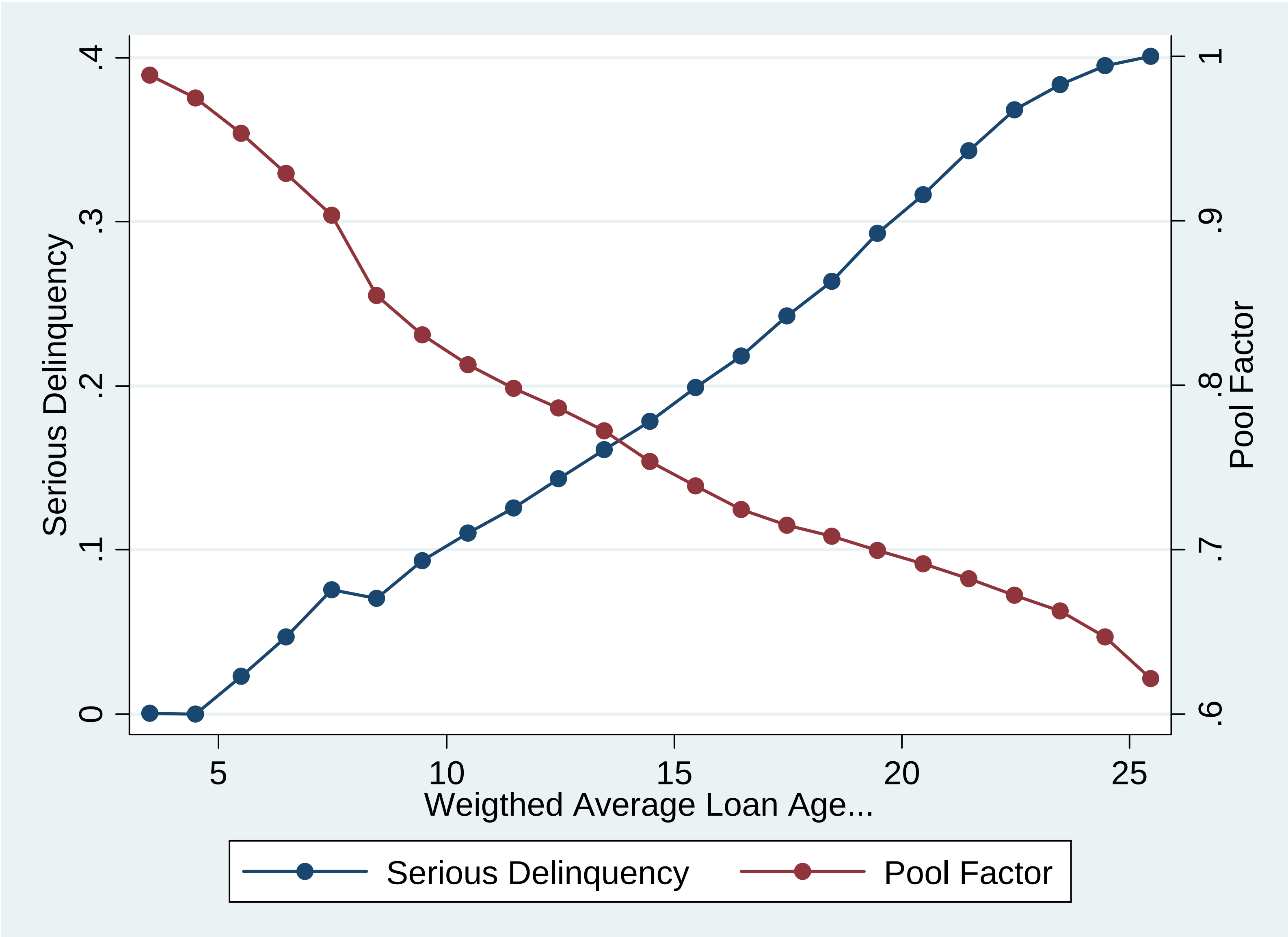
GSAMP 2006-NC2: mortgage pool at origination

- 98.7% of the mortgage loans are first-lien.
- 43.3% are purchase loans
- 90.7% owner-occupied
- 73.4% single-family homes
- 38.0% and 10.5% CA and Fl, respectively
- Mean FICO of 626, 31.4% below 600, 6.7% above 660.
- Mean CLTV of 80.34%, 62.1% of 80% or lower, 28.6% between 80% and 90%, and 9.3% between 90% and 100%.
- Average DTI is 41.78%.

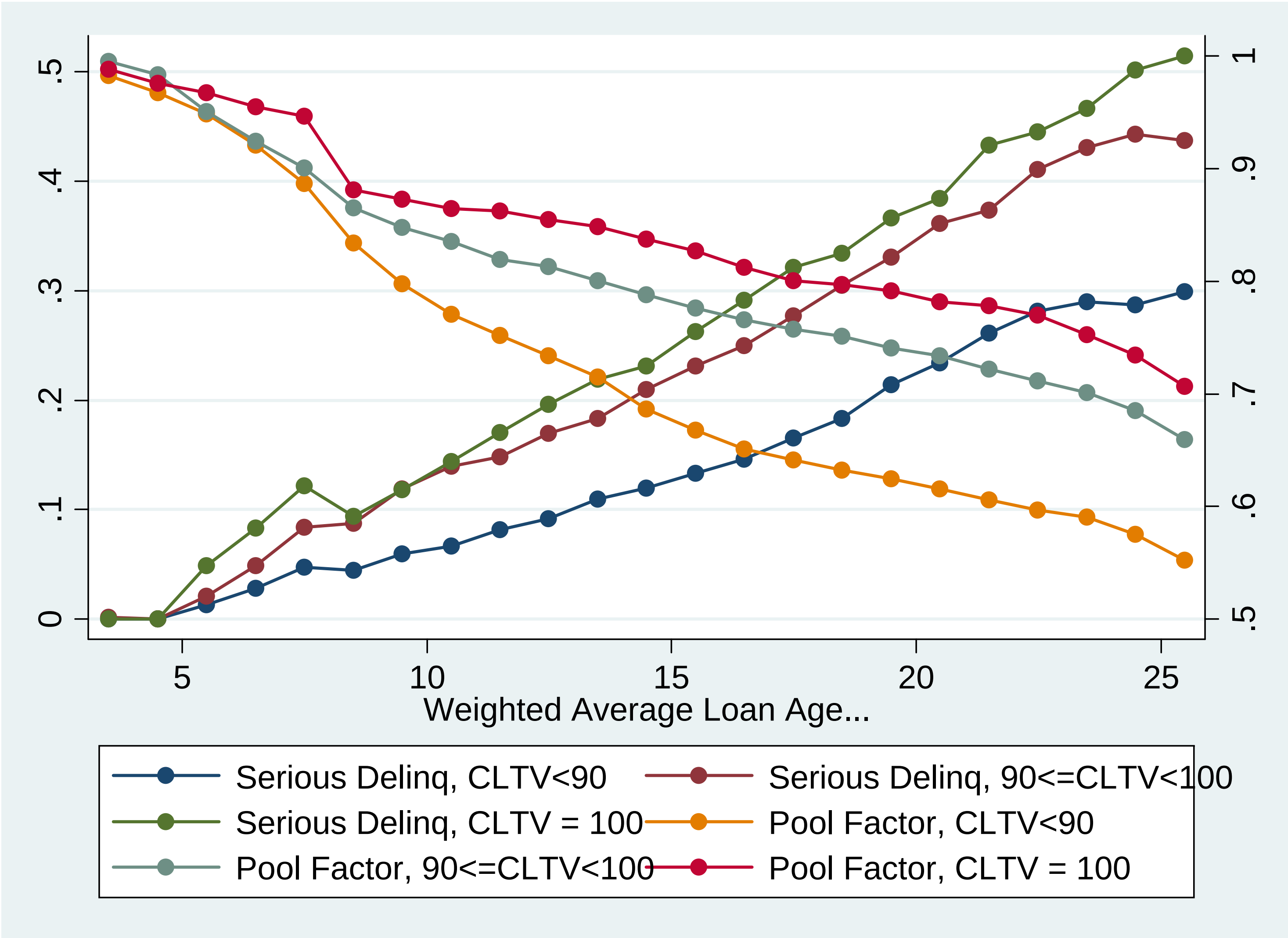
GSAMP 2006-NC2 mortgage pool at origination

Loan Type	Gross Rate	Margin	Initial Cap	Periodic Cap	Lifetime Cap	Floor	IO Period	Notional ($m)	% Total
FIXED	8.18	X	X	X	X	X	X	$ 79.12	8.98%
FIXED 40-year Balloon	7.58	X	X	X	X	X	X	$ 24.80	2.81%
2/28 ARM	8.64	6.22	1.49	1.49	15.62	8.62	X	$ 221.09	25.08%
2/28 ARM 40-year Balloon	8.31	6.24	1.5	1.5	15.31	8.31	X	$ 452.15	51.29%
2/28 ARM IO	7.75	6.13	1.5	1.5	14.75	7.75	60	$ 101.18	11.48%
3/27 ARM	7.48	6.06	1.5	1.5	14.48	7.48	X	$ 1.71	0.19%
3/27 ARM 40-year Balloon	7.61	6.11	1.5	1.5	14.61	7.61	X	$ 1.46	0.17%
Total	8.29	X	X	X	X	X	X	$ 881.50	100.00%

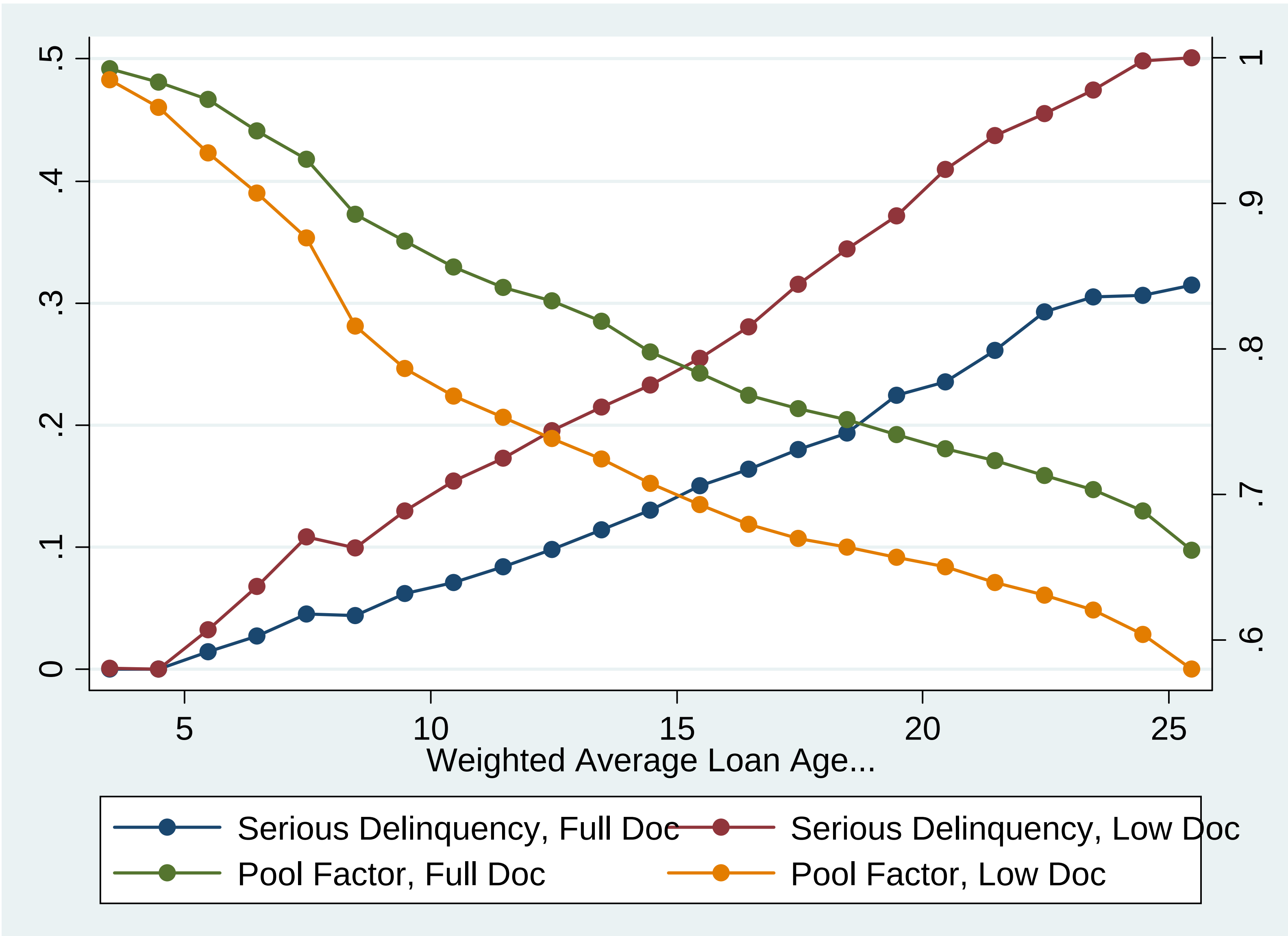
Overview of mortgage pool performance to date



Pool performance by original CLTV



Pool performance by documentation level



Tranching for GSAMP Trust 2006-NC2

Tranche description				Credit Ratings		Coupon Rate	
Class	**Notional**	**Width**	**Sub**	**S&P**	**Moody's**	**-1**	**-2**
A-1	$239,618,000	27.18%	72.82%	AAA	Aaa	0.15%	0.30%
A-2A	$214,090,000	24.29%	48.53%	AAA	Aaa	0.07%	0.14%
A-2B	$102,864,000	11.67%	36.86%	AAA	Aaa	0.09%	0.18%
A-2C	$99,900,000	11.33%	25.53%	AAA	Aaa	0.15%	0.30%
A-2D	$42,998,000	4.88%	20.65%	AAA	Aaa	0.24%	0.48%
M-1	$35,700,000	4.05%	16.60%	AA+	Aa1	0.30%	0.45%
M-2	$28,649,000	3.25%	13.35%	AA	Aa2	0.31%	0.47%
M-3	$16,748,000	1.90%	11.45%	AA-	Aa3	0.32%	0.48%
M-4	$14,986,000	1.70%	9.75%	A+	A1	0.35%	0.53%
M-5	$14,545,000	1.65%	8.10%	A	A2	0.37%	0.56%
M-6	$13,663,000	1.55%	6.55%	A-	A3	0.46%	0.69%
M-7	$12,341,000	1.40%	5.15%	BBB+	Baa1	0.90%	1.35%
M-8	$11,019,000	1.25%	3.90%	BBB	Baa2	1.00%	1.50%
M-9	$7,052,000	0.80%	3.10%	BBB-	Baa3	2.05%	3.08%
B-1	$6,170,000	0.70%	2.40%	BB+	Ba1	2.50%	3.75%
B-2	$8,815,000	1.00%	1.40%	BB	Ba2	2.50%	3.75%
X	$12,340,995	1.40%	0.00%	NR	NR	N/A	N/A

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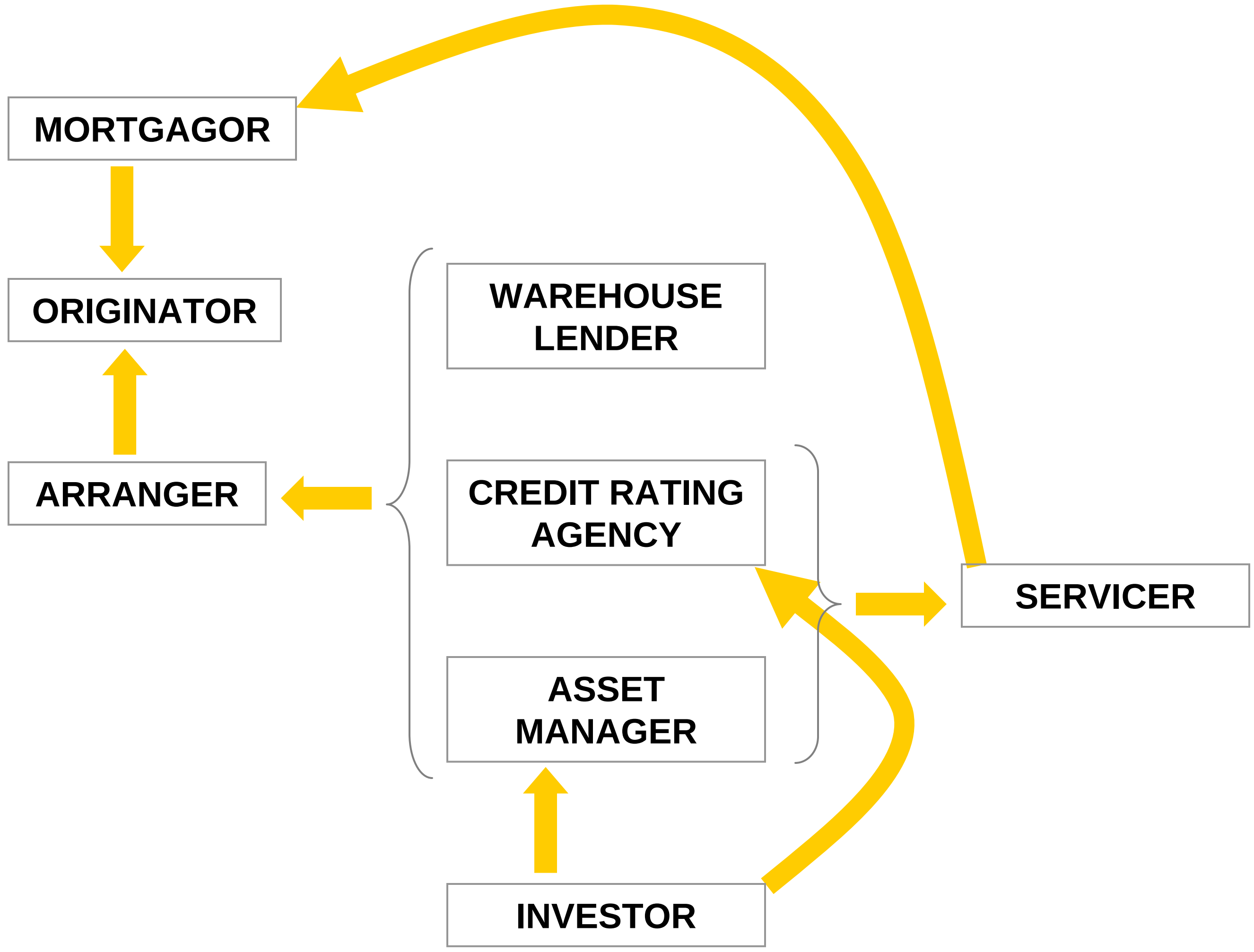

Source: Ashcraft and Schuermann (2007): “Understanding the Securitization of Subprime Mortgage Credit”

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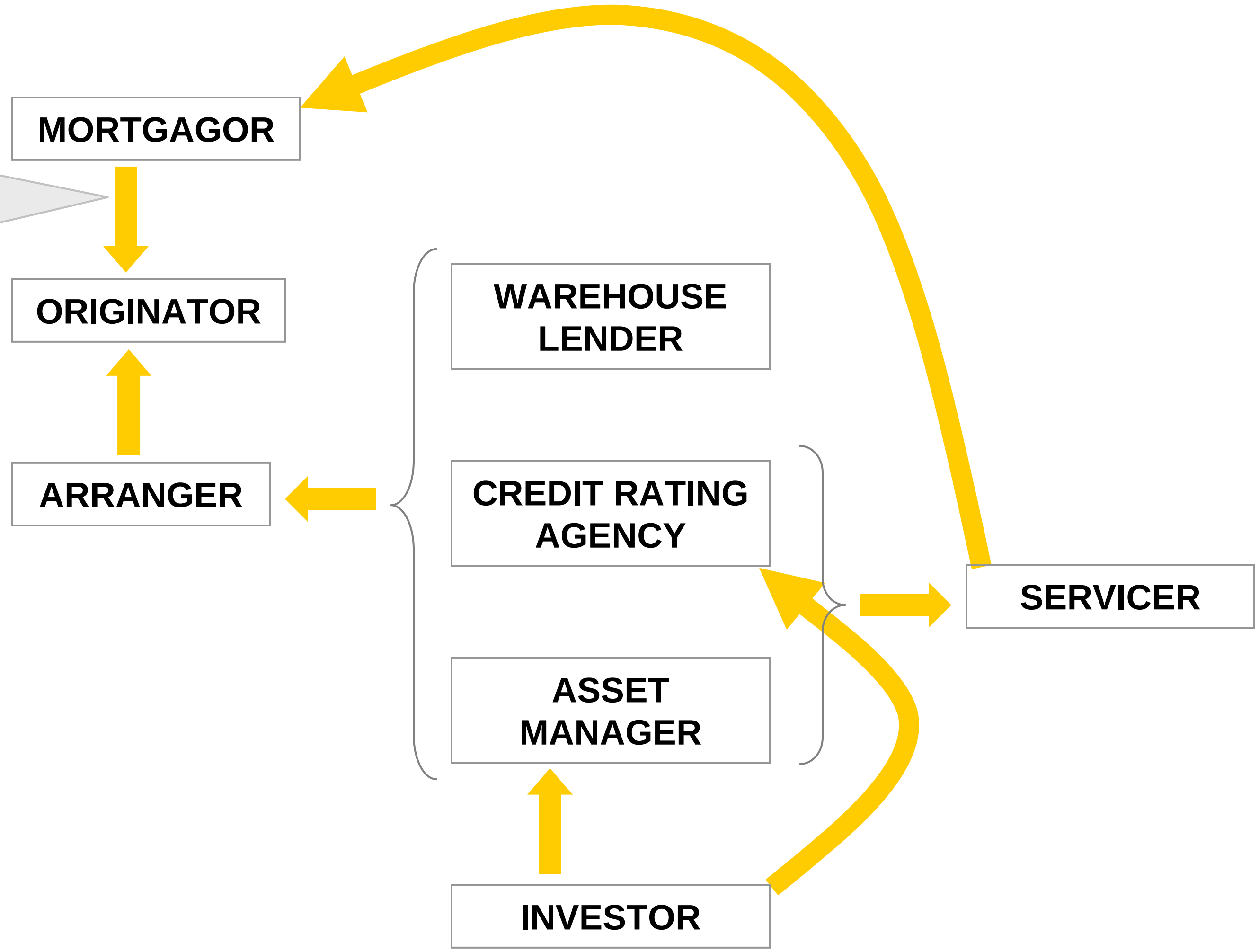
1. Predatory lending: Subprime borrowers can be financially unsophisticated – either unaware of all options available or unable to make the best choice between options.



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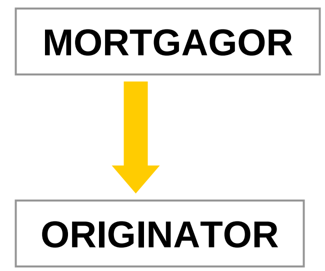
1. Originator & borrower: predatory lending

- Welfare-reducing provision of credit
  – Results in “too much” lending

- Borrowers, especially subprime, can be financially unsophisticated
  – Some borrowers don't know best price
  – Some borrowers can't make the right choice (overconfidence)
  – % of subprime mortgage with strong optionality*: 2000 (2007): 0.1% (36.8%)

- <u>Resolution</u>: State, local, federal laws and the rating agencies; warranties and representations of originator



*: include interest only ARMs and 30-year ARMs on a 40-year amortization schedule

Evidence from Academic Literature

Ernst, Bocian, and Li (2008): "Steered Wrong: Brokers, Borrowers, and Subprime Loans“

- Study 1.7 million mortgages produced between 2004 to 2006
- Use matched sample methods, comparing brokered and retail originations
- Note between 63 and 81 percent were brokered in 2006
- Conclude that brokered loans cost more (130 bps), and that the effect larger for subprime

Final Thoughts on Predatory Lending (1)

- **Problems are larger than predation:**
  - –Subprime loan performance remains horrific and is not improving despite massive rate cuts (which offset hybrid ARM resets)

- **High-cost credit is not all bad:**
  - –Morgan (2006): "Defining and Detecting Predatory Lending"

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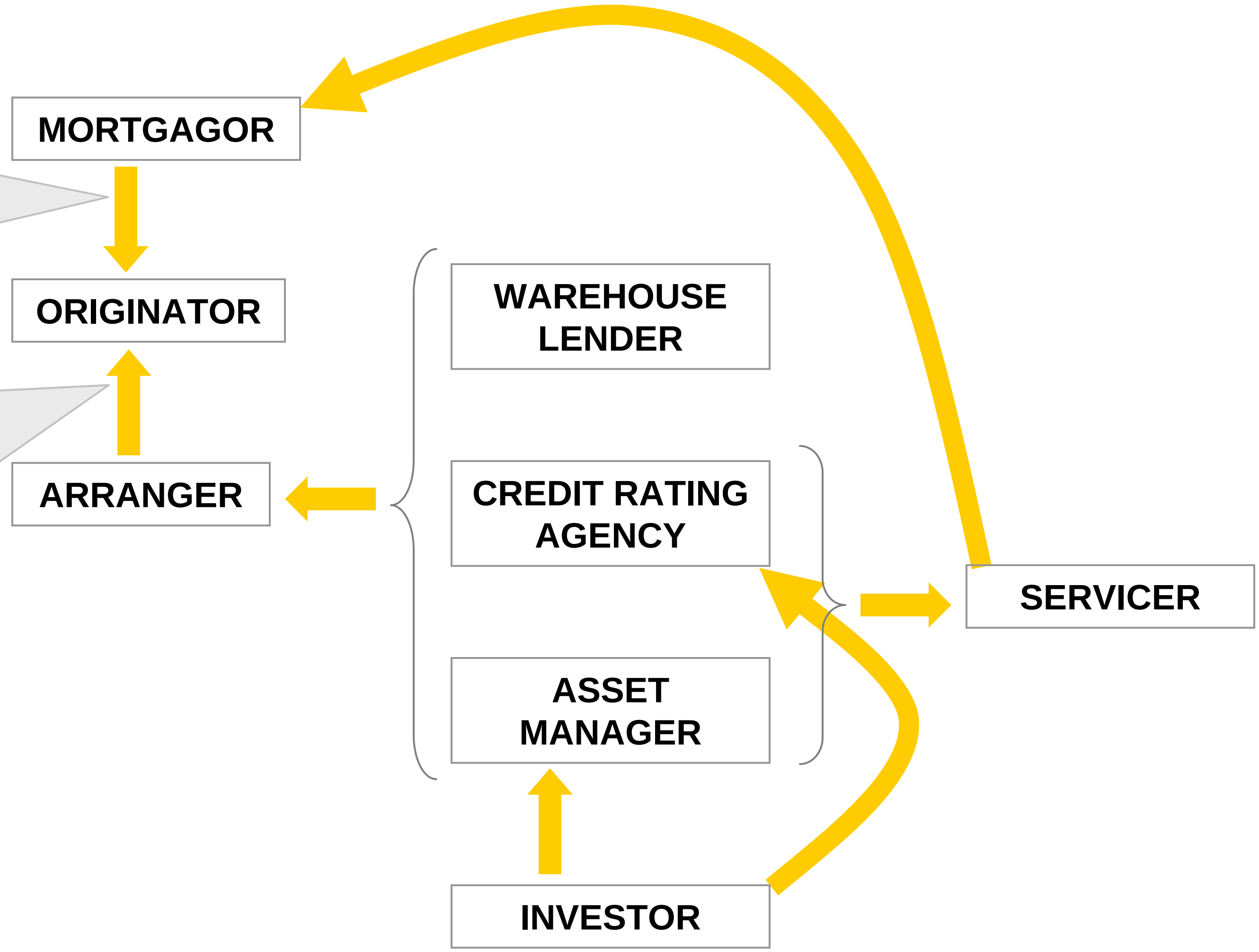

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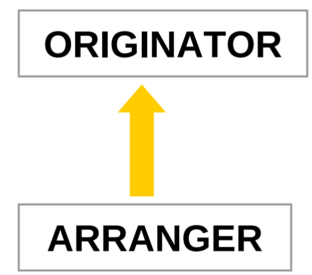
2. Originator & arranger: predatory borrowing & lending

- Originator has an informational advantage over the arranger with regard to the quality of the borrower
  - Predatory borrowing (and lending)

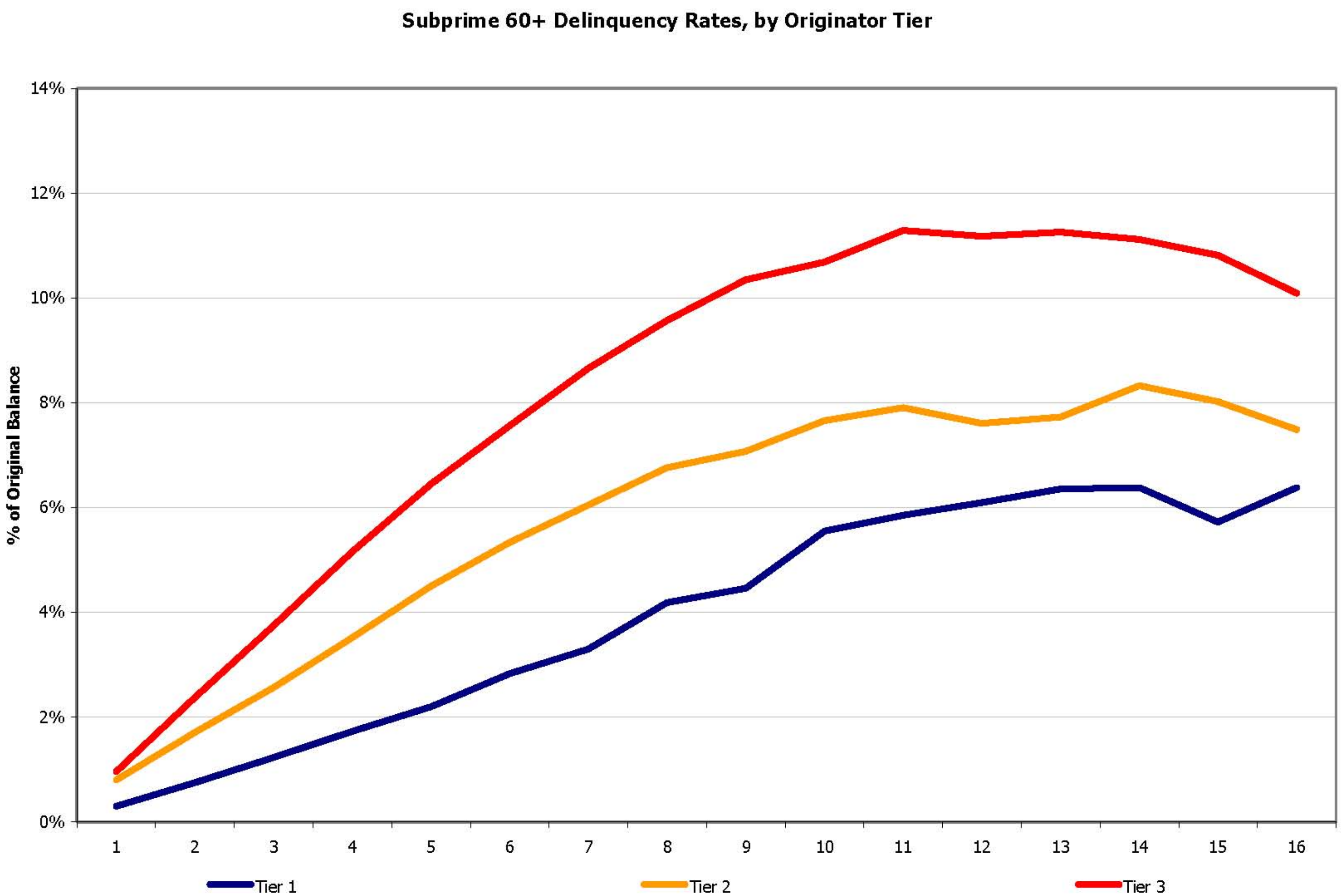
- Originator and borrower collaborate to overstate income, misrepresent occupancy, hide other details
  - % of full-doc subprime mortgage in 2000 (2006): 73.4 (57.7)



- Fast HPA increase returns to speculation, criminal activity, reduces the cost of fraud to lenders

- <u>Resolution</u>: due diligence of arranger, representation & warranties of originator, capital and other business lines of originator

Performance by Tier



Evidence from Academic Literature

- **Ben-David (2008): "Manipulation of Collateral Values by Borrowers and Intermediaries“**
  – Documents that highly leveraged borrowers more likely to buy a property which signals willingness of seller to give cash back, and are more likely to pay full listing price or more; also these buyers pay more for houses and are more likely to default, but pay the same interest rate

- **Seru et al. (2008): "Did Securitization Lead to Lax Screening? Evidence from Subprime Loans?"**
  – The authors document that securitized loans with FICO scores above 620 default more frequently than securitized loans with scores just below 620, but only for low documentation loans

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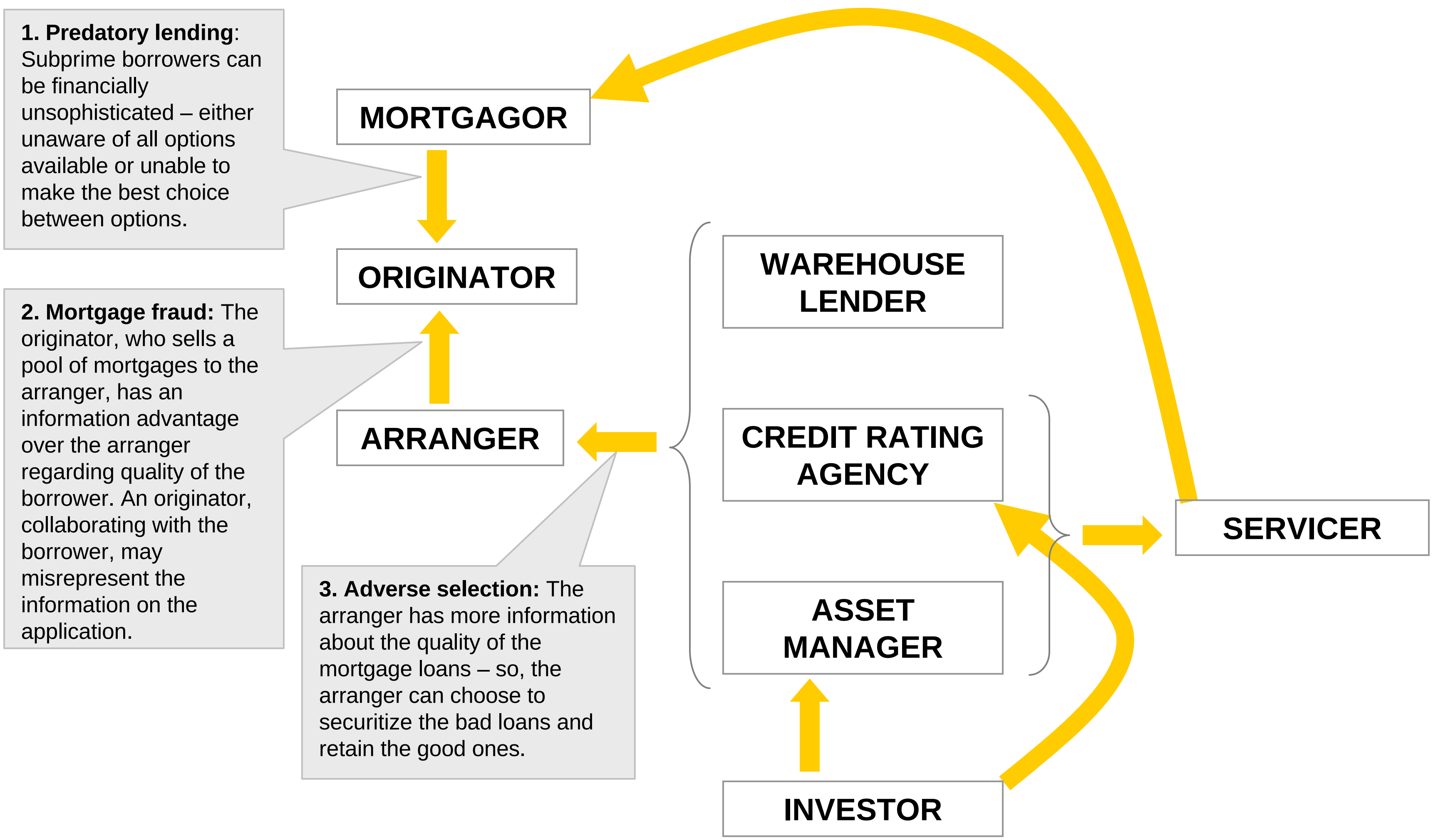
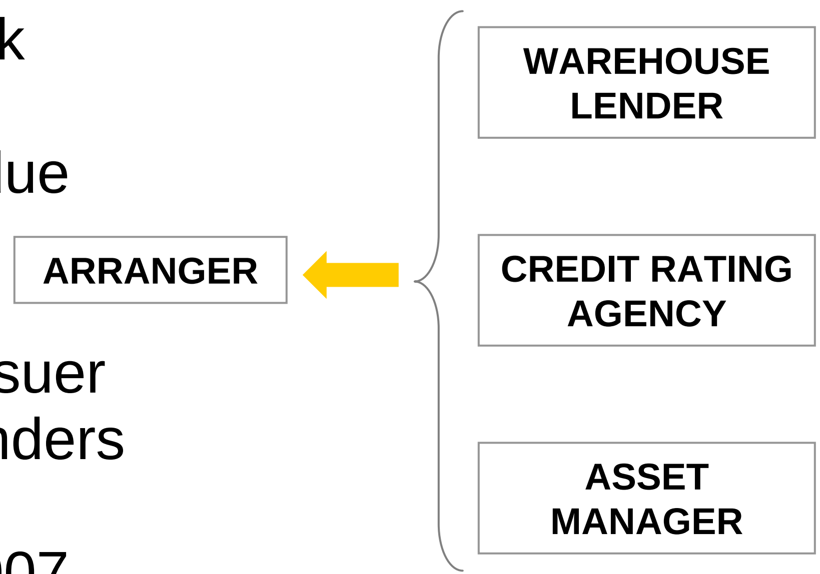


Source: Ashcraft and Schuermann (2007): “Understanding the Securitization of Subprime Mortgage Credit”

3. Arranger and third parties: adverse selection

- Arranger has an informational advantage with regard to the quality of the mortgage loans

- Arranger → warehouse lender (bank lender, ABCP conduit)
  - Resolution: collateral haircuts; due diligence; spreads; ratings
  - Example: New Century (#2 subprime originator and MBS issuer in 2006) defaulted in April as lenders refused to extend further credit
  - ABCP funding dried up in fall 2007



- Arranger → asset manager
  - Resolution: due diligence; arranger reputation; funded o/c; ratings

Evidence from Academic Literature

- **Drucker and Mayer (2007): "Inside Information and Market Making in Secondary Mortgage Markets“**
  - The authors document that underwriters of prime RMBS exploit inside information when trading in the secondary market. Underwriters bid on a majority of their own tranches, but the ones on which they do not bid perform worse ex post.

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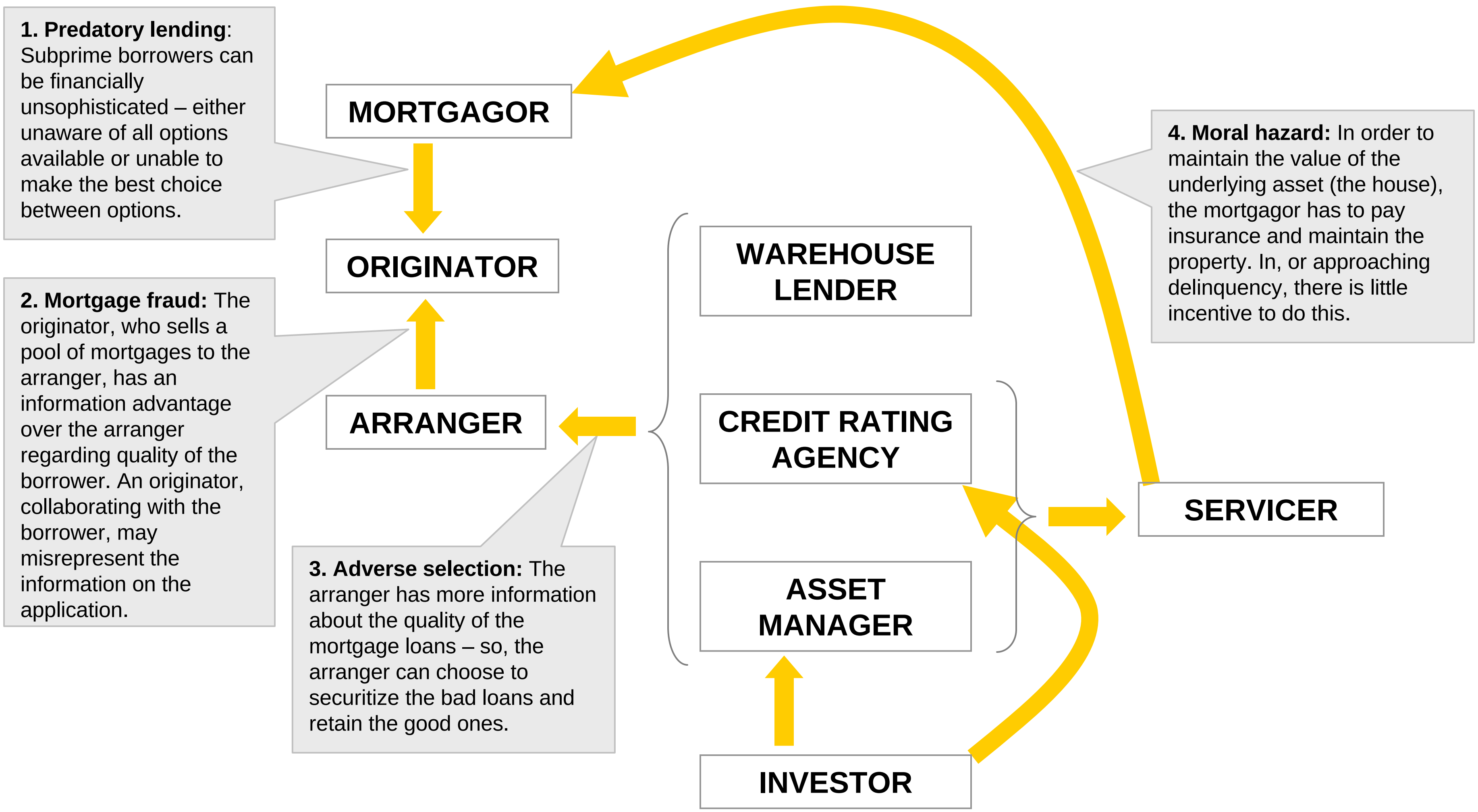

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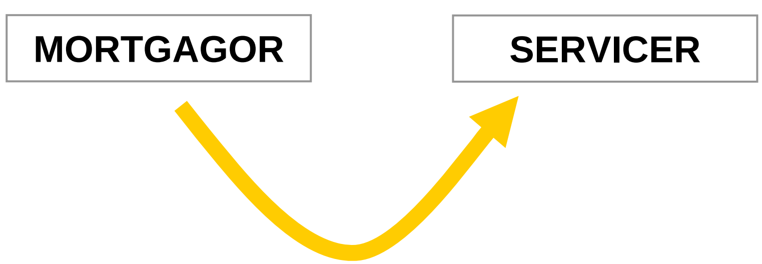
4. Servicer & borrower: moral hazard (borrower)

- Unobserved effort + limited liability → moral hazard
- Costly to monitor borrower payment of taxes, insurance, upkeep of property and occupancy
- With significant declines in home prices, borrowing homeowners may have negative equity
  - Underwater but performing borrowers are unable to sell their homes without bringing cash to closing
- Resolution: escrows (maybe not subprime), limits on leverage, principal modifications



www.youwalkaway.com

- Are you stressed out about your mortgage payments?
- Do you have little or no equity in your home?
- Have you had trouble trying to sell your house?
- Is your home sinking under the waves of the real estate crash?
- **What if you could live payment free for up to 8 months or more and walk away without owing a penny?**
- Unshackle yourself today from a losing investment and use our proven method to Walk Away.
- If you QUALIFY for our plan:
- Your lender WILL NOT be able to call you in attempt to collect!
- Your lender WILL NOT be able to collect any deficiency or loss they may receive by you walking away!
- You WILL be able to stay in your home for up to 8 months or more without having to pay anything to your lender!
- You CAN have the foreclosure REMOVED from your credit!

Bankruptcy reform: unintended consequences

- **Morgan et. al. (2008): "Bankruptcy Reform and Subprime Foreclosures“**
  - In Chapter 7, households with credit card and mortgage debt have unsecured debts (like credit cards) expunged, and keep assets with value below the exemption, which typically included equity in their home
  - Recent bankruptcy reform has made it more difficult for a borrower to file Chapter 7 through a means test
    - Shifted the balance of power between mortgage lenders and unsecured lenders
  - The authors document that there has been a larger increase in subprime foreclosures in states with higher bankruptcy exemptions

- A 2007 report by Experian documented some evidence that consumers are more likely to pay their credit cards and auto loans than their mortgages
  - Mortgage Forgiveness Debt Relief Act of 2007 prevents the IRS from collecting taxes on mortgage principal write-downs

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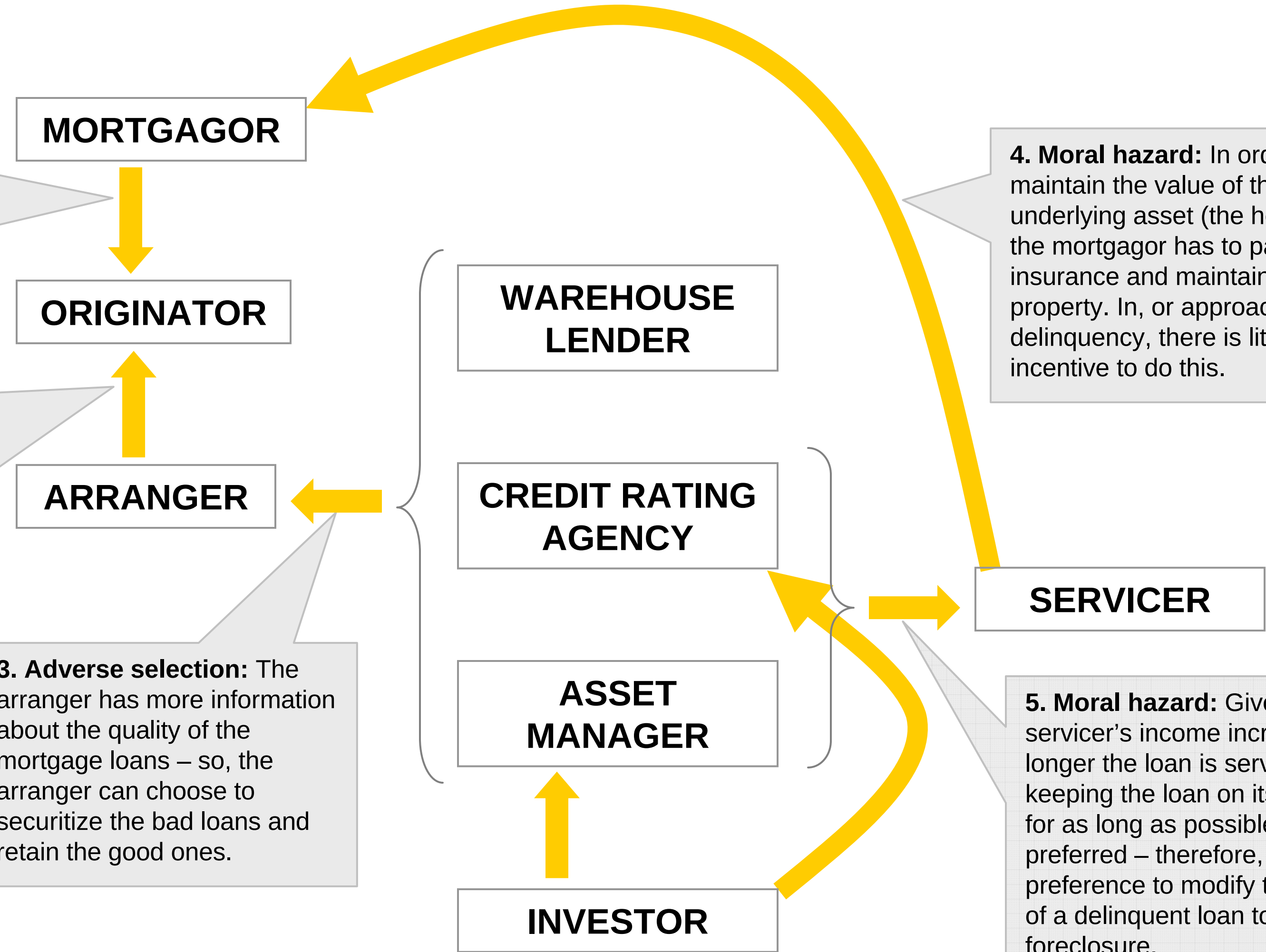

3. Adverse selection: The arranger has more information about the quality of the mortgage loans – so, the arranger can choose to securitize the bad loans and retain the good ones.

4. Moral hazard: In order to maintain the value of the underlying asset (the house), the mortgagor has to pay insurance and maintain the property. In, or approaching delinquency, there is little incentive to do this.

5. Moral hazard: Given that the servicer's income increases the longer the loan is serviced, keeping the loan on its books for as long as possible is preferred – therefore, it has a preference to modify the terms of a delinquent loan to delay foreclosure.

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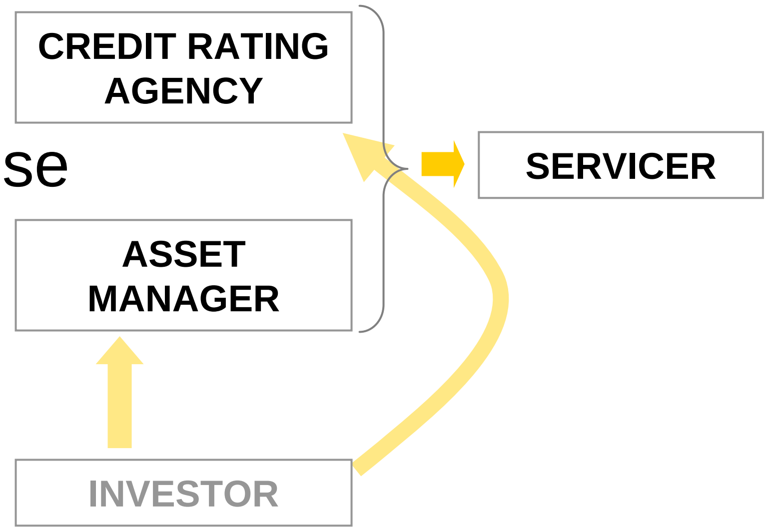
5. Servicer & third parties: moral hazard (servicer)

- Servicer effort and quality has important impact on losses
- Servicer compensated on basis of loans under management
- Tension between investor and servicer in decision to modify/foreclose
- Servicer has an incentive to inflate expenses
- <u>Resolution</u>: pooling & servicing agreement; servicer quality ratings (rating agencies); master servicer



- Example: Countrywide to modify terms on $16bn in ARMs facing reset ($10bn for subprime)

Evidence from Academic Literature

- **Mayer et al (2007): "Agency Conflicts, Asset Substitution, and Securitization“**
  - Using data on 357 commercial mortgage-backed securities deals, the authors show that when holding the first-loss position, special servicers appear to behave more efficiently, making fewer costly transfers of delinquent loans to special servicing, but liquidating a higher percentage of loans that are referred to special servicing

Final Thoughts on Moral Hazard of Servicer (5)

Securitization is not well-suited to handle modifications

- True sale (SFAS 140) requires that the servicer go bank to the bond holders to approve modifications else control has not shifted

- However, the bondholders are widely-dispersed and have conflicting interests

- It is in the interest of junior tranche holders to delay loss in order to avoid the writedown of bond principal.

- The use of modifications instead of liquidations can trigger the release of o/c to equity tranche investors.

- Limits on modifications are in place to protect senior investors from excessive "modification"

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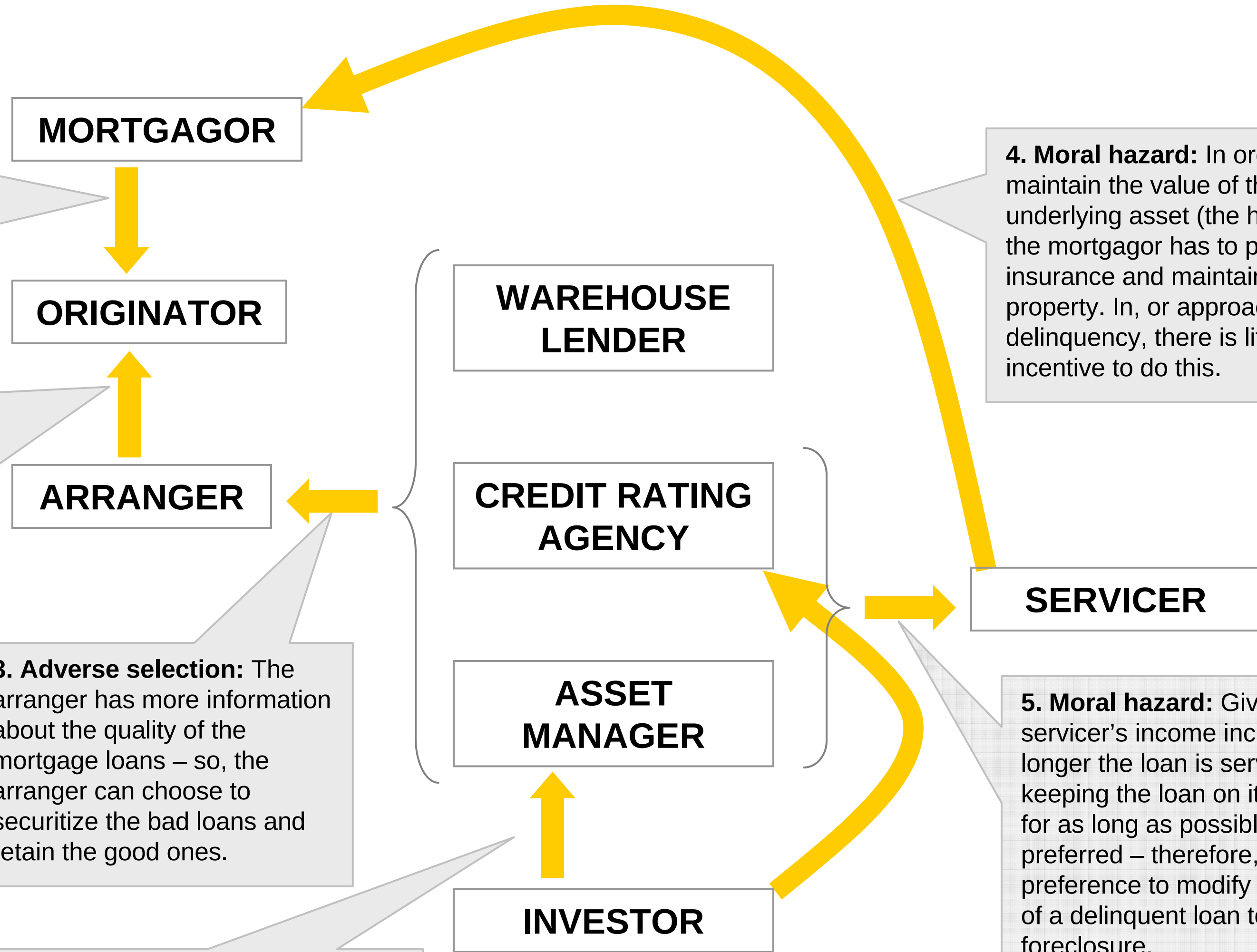

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6. Principal-agent: While the investor provides funding for the mortgage-backed security, the asset manager conducts the due diligence on the investments and finds the best price for the trades – the asset manager may not take sufficient effort on behalf of the investor.

Source: Ashcraft and Schuermann (2007): "Understanding the Securitization of Subprime Mortgage Credit"

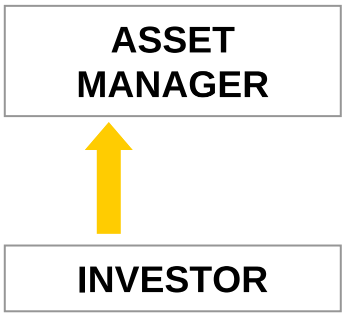
6. Investor & asset manager: principal-agent

- Asset managers (agent) act on behalf of investors (principal) who may not be financially sophisticated

- Asset managers develop investment strategies, conduct due diligence, find the best price
  - But that's costly

- <u>Resolution</u>: investment mandates, evaluation relative to peer or benchmark, credit ratings, external consultants

- Example: Ohio Police & Fire Pension Fund
  - Fixed income portfolio managed by Lehman Brothers, JPMC, et al.
  - Portfolio broadly similar to benchmark index and have w/a rating of A
  - Minimum rating of BBB-



The ABS CDO problem

Adelson and Jacob (2008): "The Subprime Problem: Causes and Lessons"

- Until 1997 the vast majority of subprime RMBS used bond insurance as credit enhancement.
- From 1997 to 2002, about half of deals used bond insurance and the other half used subordination as credit enhancement.
- In 2004 ABS CDOs and CDO investors became the dominant class of agents pricing credit risk on subprime RMBS, displacing bond insurers and other sophisticated investors
- CDOs were willing to accept loans that traditional investors would not have accepted, and originators began originating riskier and riskier loans.

Evidence: Compare monoline direct exposures to RMBS vs ABS CDO exposures

Final Thoughts on Principal-Agent

- Most exposure from ABS CDOs was either retained by issuers or hedged with monoline insurers
- Key risk management failure was by relatively sophisticated investors who did not look to the underlying collateral and likely relied too much on the underlying credit ratings
- Re-securitization of RMBS likely obscured the presence of these frictions to the ultimate investors
- Investors who use credit ratings as an input to risk management should have an independent view on the efficacy of the ratings criteria
- As this exposure remained in the trading books of supervised institutions, this highlights an important failure in the supervision of risk management

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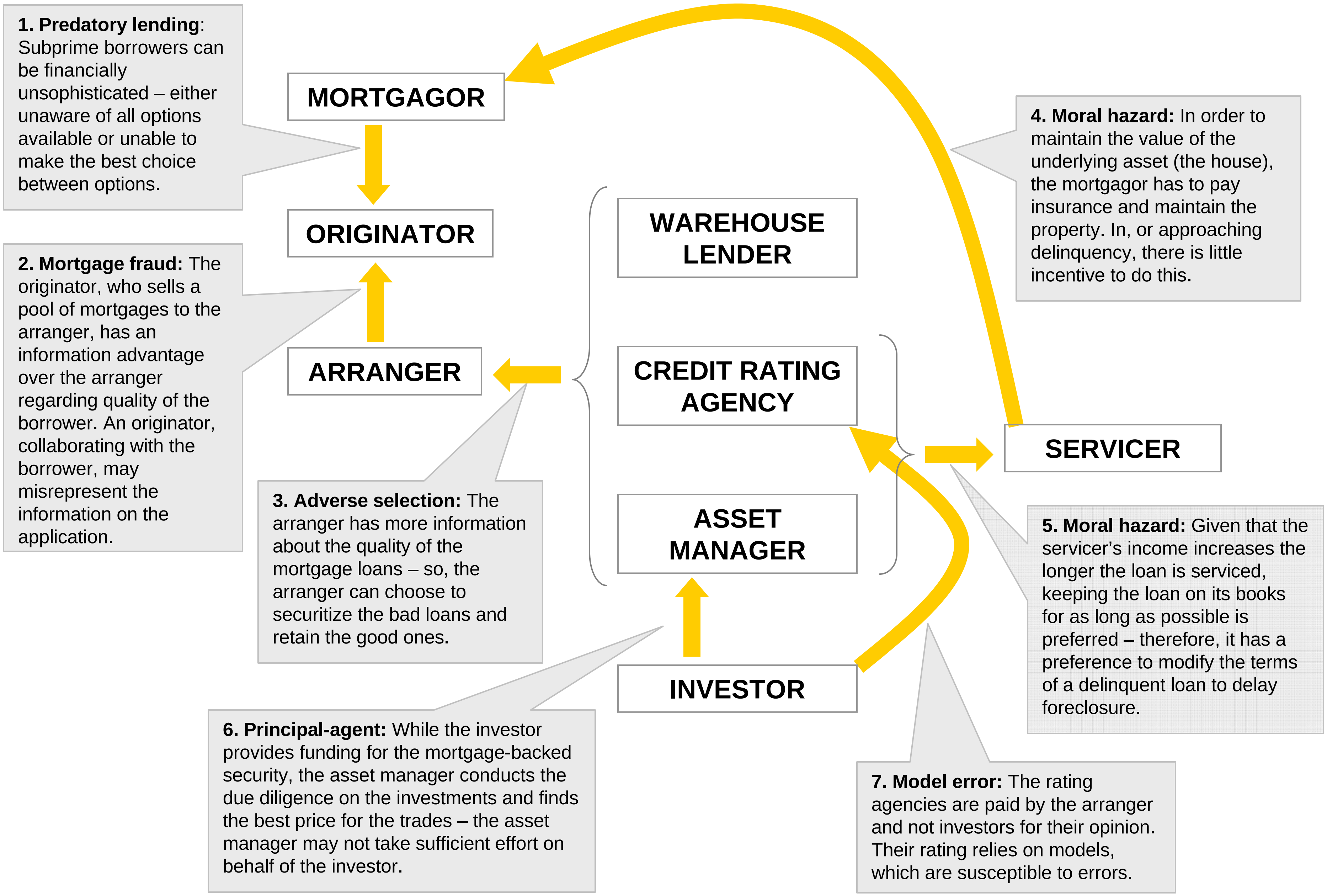

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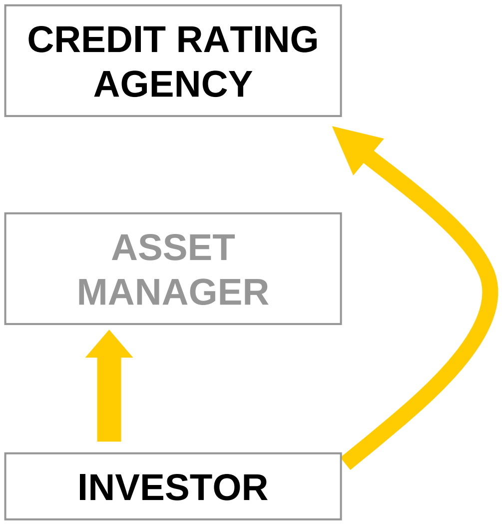
7. Rating agencies: model error

- Rating agencies paid directly by arranger (indirectly by investor) → potential conflict of interest (race to bottom)

- Agency opinion comes from models and "expertise"
  - Investors not able to evaluate agency ability
  - Honest and dishonest opinion mistakes

- Resolution: transparency of ratings process (e.g. models, underlying assumptions); reputation

- Rating agencies have significantly changed rating criteria for MBS



The Key Mistakes

- **Underestimated the severity of the housing downturn**
  - Housing markets were historically local, but securitization created correlation which did not previously exist
- **Used limited historical data**
  - Could not accurately estimate the response of borrowers to significant price declines
- **Ignored the originator risk factor**
  - Did not respond to the arbitrage of rating criteria by weak originators
- **Ignored the refinancing stress risk factor**
  - Never anticipated the complete evaporation of refinancing opportunities

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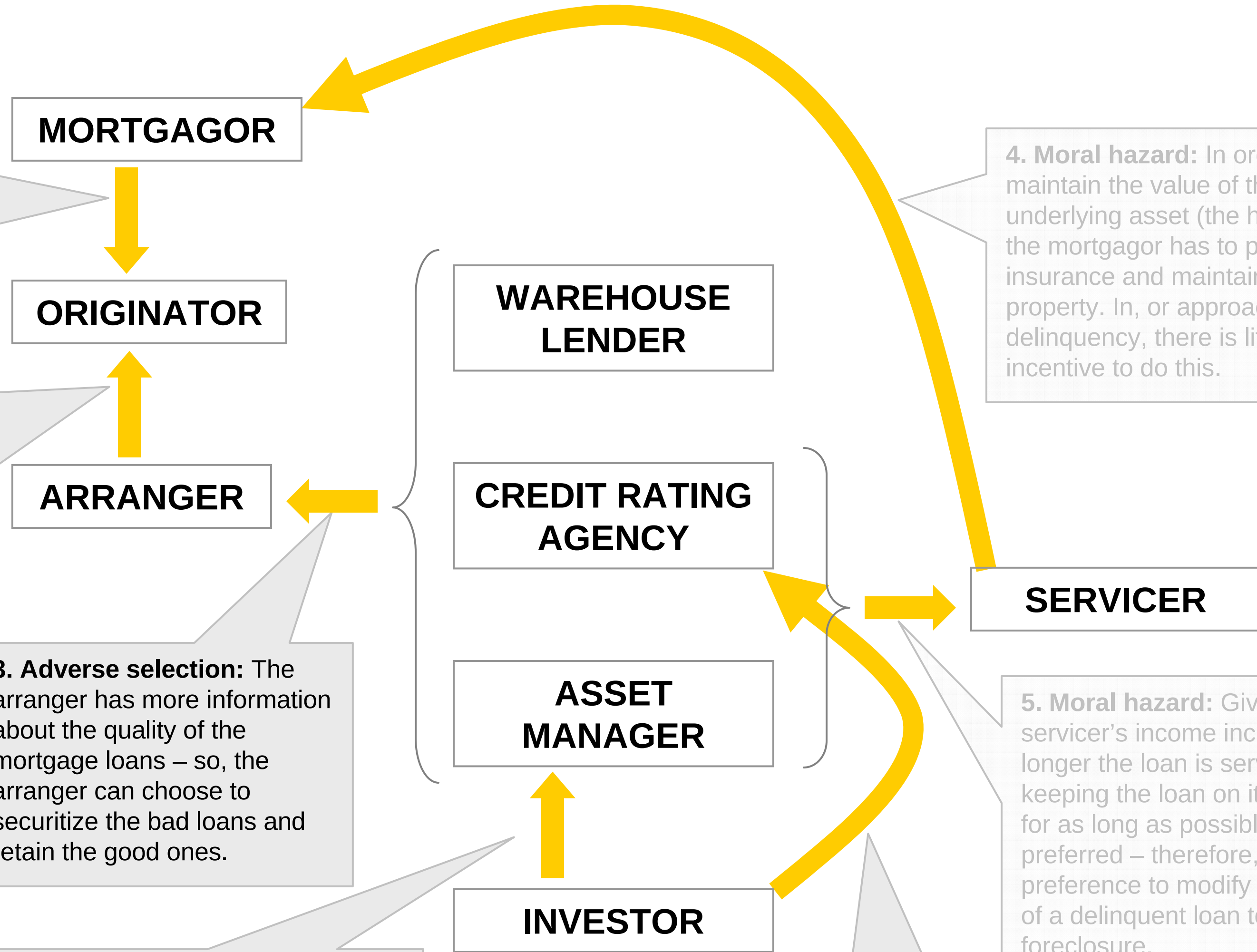

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6. Principal-agent: While the investor provides funding for the mortgage-backed security, the asset manager conducts the due diligence on the investments and finds the best price for the trades – the asset manager may not take sufficient effort on behalf of the investor.

7. Model error: The rating agencies are paid by the arranger and not investors for their opinion. Their rating relies on models, which are susceptible to errors.

Source: Ashcraft and Schuermann (2007): "Understanding the Securitization of Subprime Mortgage Credit"

Final thoughts

- Investors and credit rating agencies both made similar errors in underestimating the risk of subprime mortgage loans
  – Fix techncial flaws in the RMBS rating process and reduce perception that conflicts-of-interest are important
  – Investors and supervisors should look through to collateral and have independent view on rating agency models when managing risk of re-securitizations

- Some other shoulds:
  – Mortgage broker and borrower incentives should be aligned
  – A third party should certify originator underwriting practices
  – Arrangers should re-write pooling and servicing agreements for future securitizations to make loan modifications easier

Thank You!

http://nyfedeconomists.org/schuermann/