Financial Crisis & Economic Uncertainty

Laurence Booth
Rotman School of Management
February
February 2010

Rotman
UNIVERSITY OF TORONTO

“President Bush met with small business owners in San Antonio last week to discuss the state of the economy. Present were representatives of General Motors, Citigroup, AIG and the Hartford Insurance Company”

Jay Leno (sort of) (Dec 2008)

New Corporate logos

Apple

DOWNJONES

2M

Fail

CRISISLER

LG

Life's tough

PLEASE BUY

YAHOOO?

xerox

Topic of this talk

- What defines the crisis of 2008/9?
- Where are we in the crisis?
- What is the prognosis for the next six months?
- What are the lessons to be learned?

DOW JONES INDUSTRIAL AVERAGE AND S&P 500 INDICES

Weekly

Source: Federal Reserve Board

Rotman
UNIVERSITY OF TORONTO

Table 1: MARKET LOSSES (YEAR-TO-DATE)

Index or Exchange (US Dollars)	Last Trade Date	1 Day Change	1 Day %	1 Month %	6 Month %	YTD %	2006 $b Value
United States Composite	213.40 10/24/2008	-7.52	-3.40%	-27.53%	-37.17%	-40.46%	18,039
Japan Composite	82.39 10/24/2008	-2.74	-3.21%	-22.00%	-32.07%	-35.54%	4,422
United Kingdom Composite	149.79 10/24/2008	-11.63	-7.21%	-35.44%	-48.66%	-52.51%	3,441
Canada Composite	278.25 10/24/2008	-4.74	-1.67%	-40.46%	-48.15%	-49.61%	1,636
Germany Composite	218.89 10/24/2008	-14.62	-6.26%	-39.40%	-51.88%	-56.28%	1,426
Hong Kong Composite	186.44 10/24/2008	-10.10	-5.14%	-31.80%	-51.39%	-57.97%	1,361
Spain Composite	388.93 10/24/2008	-26.01	-6.27%	-34.22%	-50.24%	-51.93%	1,146
Switzerland Composite	374.65 10/24/2008	-10.44	-2.71%	-22.21%	-32.06%	-34.35%	1,111

Rotman
UNIVERSITY OF TORONTO

- US and Canadian stock market collapse was not the result of an asset bubble
- So why the collapse?
- *Problems in the US (and UK) banking system*
  - *Problem loans & mortgages*
  - *credit crunch!*

Troubled Banks

Fannie Mae:	Nationalised (State ownership)
Freddie Mac:	Nationalised (State Ownership)
HBOS:	Taken Over by Lloyds (UKG Help)
Washington Mutual:	Collapsed : JP Morgan Chase purchase
Fortis:	Nationalised (State Ownership)
Bradford & Bingley:	Nationalised (State Ownership)
Wachovia:	Taken over by Wells Fargo
Glitner (Iceland):	Nationalised (State Ownership)
Hypo Real estate:	Rescue package
Bear Stearns:	Taken over by JP Morgan Chase
Lehman Brothers:	Bankruptcy
Merrill Lynch:	Taken over by Bank America
Goldman /Morgan Stanley:	Forced into becoming banks
AIG:	Nationalised (80% USG Ownership through warrants)
Hartford	Bailout out with TARP money
Iceland:	Russian $6 billion rescue package
Greece/Dubai	?
Citigroup	$306 b bailout (21/11/2008)
Bank America	$109 b bailout to absorb Merrill's losses ($45b TARP)
RBS	$41 b in losses (16/1/2009)
UK banks	RBS and Lloyds UKG ownership
USG	Stress tests (4/5/09): conversion TARP prefs into common

Rotman
UNIVERSITY OF TORONTO

BANK	2007	2008	2009 YTD	TOTAL
Citigroup (C.N)	29.1	63.4	30.7	$123.2
Wachovia Corp*	4.0	73.4		$77.4
Bank of America (BAC.N)	12.1	29.2	35.5	$76.8
Merrill Lynch**	25.1	38.6		$63.7
HSBC (HSBA.L)	19.3	30.3	13.9	$63.5
Lloyds (LLOY.L)&	6.8	28.9	22.3	$58.0
UBS (UBSN.VX)		50.6	1.8	$52.4
Royal Bk Scotland (RBS.L)	7.0	23.5	19.6	$50.1
Fannie Mae (FNM.N)	4.7	26.9	15.4	$47.0
JPMorgan Chase (JPM.N)	4.5	10.2	29.5	$44.2
Freddie Mac (FRE.N)	5.2	24.4	12.8	$42.4
Washington Mutual***	5.1	36.7		$41.8
Barclays (BARC.L)	7.0	16.5	12.7	$36.2
Wells Fargo (WFC.N)	3.5	8.7	18.2	$30.4
Lehman Brothers****	12.5	14.0		$26.5
Santander (SAN.MC)	4.8	8.3	13.2	$26.3
Morgan Stanley (MS.N)	10.3	10.1	2.4	$22.8
Commerzbank/Dresdner (CBKG.DE)	3.9	13.3	4.5	$22.3
BNP Paribas+ (BNPP.PA)	2.4	8.0	11.4	$21.8
Deutsche Bank (DBKGn.DE)	4.0	11.2	4.9	$20.1
IKB &&				$14.7
Credit Suisse (CSGN.VX)	3.5	11.9	0.5	$14.6
BBVA (BBVA.MC)	2.7	4.2	7.7	$14.6
National City*****				$14.0
Societe Gen+ (SOGN.PA)	1.3	3.7	7.9	$12.9
UniCredit (CRDI.MI)	3.5	5.1	2.4	$11.0
C.Agricole+ (CAGR.PA)	2.7	4.4	3.1	$10.2
ING (ING.AS)		7.1	2.4	$9.5
Bayern LB	1.1	8.0		$9.1
Intesa Sanpaolo (ISP.MI)	1.6	4.5	2.6	$8.7
Goldman Sachs (GS.N)	1.7	4.9	1.9	$8.5
Natixis+ (CNAT.PA)	2.0	2.5	3.1	$7.6
Canadian Imp Bk Commerce				$6.5
Erste Bank (ERST.VI)	0.8	2.5	1.3	$4.6
Standard Chartered (STAN.L)	0.8	1.8	1.1	$3.7
Bear Stearns******	3.0	0.6		$3.6
Fortis				$3.1
WestLB				$3.0
Rabobank	0.8	1.7		$2.5
Total				$1,119.3

Reuters Feb 18, 2010

Credit Creation by Banks

- Deposit of $100 cash (real money) into First Canadian

First Canadian

Assets		Liabilities	
(Vault) cash	+$100	Deposits	+$100

- Bank discovers that the deposit is not withdrawn and just sits there!

Basics of Banking 1

- Bank discovers that only 10% of the $100 is needed as a reserve and lends out 90% or $90

First Canadian

Assets		Liabilities	
Desired reserves	+$10	Deposits	+$100
Excess: loan	+$90		

- The $90 loan allows the individual to withdraw cash
- They either leave it on deposit or pay someone else who in turn deposits it!

Basics of Banking 2

- Eventually we end up with

First Canadian

Assets		**Liabilities**	
Desired reserves	$100	Deposits	$1000
Loans	$900		

- *Money multiplier* is $$MM = \frac{1}{\%reserves} = \frac{1}{0.1} = 10$$
- Deposits are part of the money supply (Cash plus chequing accounts M1)
- This is called a *fractional reserve* system and illustrates *credit creation*

Rotman
UNIVERSITY OF TORONTO

Problem 1: Liquidity

- The process also works in reverse: withdrawal of $100

First Canadian

Assets		Liabilities	
Desired reserves	$ 0	Deposits	$900
Loans	$900		

  - Bank uses up all its reserves: calls in loans to get cash
  - Further demands for cash & bank closes its doors
  - *Bank Run*
- The more banks in the system the greater the risk of bank runs as no one bank captures the deposits created from loans: the US has 7,000 banks, Canada 22!

Rotman UNIVERSITY OF TORONTO

Critical Insight

- Banks engage in *maturity transformation*
  - Banks have loans as assets, which are usually fixed say 2 or 3 years
  - Banks have very short liquid liabilities
  - Many of these deposits are cheap, since they serve as money: Chequing accounts
- Socially banks are critical for monetary policy and credit creation,
- Banks face liquidity risk due to bank runs
- Socially banks have always been heavily regulated to prevent bank runs
- Deposit insurance is designed to stop this happening (Great Depression)

Problem 2: Default

- Borrower can't repay and defaults on $100 loan which bank *writes off*

First Canadian

Assets		Liabilities	
Required reserves	$100	Deposits	$1000
loans	$800	Loss	$ -100

- Depositors realise that they may not all get repaid
- Demand cash to get out before others: *bank run*
- Bank needs *equity or other risk capital* to bear the cost of default, so that depositors will not run.

Rotman UNIVERSITY OF TORONTO

Basics of Banking 3

- If the Bank forecasts a maximum $100 expected *loan loss*

First Canadian (BMO)

Assets		Liabilities	
Required reserves	$100	Deposits	$1000
Loans	$900	Equity	$ 100
Securities	$100		

- The $100 in securities would be invested in *marketable securities* to replenish reserves in the event of default
- The securities are essentially assets that collateralise the deposits
- The Bank would have a *capital ratio* of 100/1100 or 9.09%

Rotman UNIVERSITY OF TORONTO

Basel I Accord - 1988

- Problem: excessive risk taking by banks and international competition among banks
- Basel 1: two fundamental standards
  - *Capital ratio*
  - *Cooke Ratio* - "risk-weighting" all on- and off-balance sheet risks.
    - *On balance* sheet are loans
    - *Off balance* sheet are guarantees
      - Bankers Acceptances
      - Line of Credit
- Risk Weighting:
  - On-balance sheet - ratios defined for certain types of assets
  - Off-balance sheet - a conversion factor to translate risks into comparable on-balance sheet risks to be risk weighting
- Basel II further refined risk weightings and management

Basel: Capital Adequacy

Asset			Credit Amount At Risk	Risk Weight	Risk Adjusted	Capital @ 8%	Capital as % Gross Asset
Balance Sheet Assets							
Government securities			$ 100.00	0	$ -	$ -	0.0%
Residential Mortgages			$ 100.00	0.5	$ 50.00	$ 4.00	4.0%
Corporate Loan			$ 100.00	1	$ 100.00	$ 8.00	8.0%
Total			**$ 300.00**		$ 150.00	$ 12.00	4.0%
	Contract Amount	**Credit Conversion Factor**	**Credit Amount At Risk**				
Off Balance Sheet							
Line of credit:Financial	$ 100.00	1	$ 100.00	1	$ 100.00	$ 8.00	8.0%
Line of credit:Non Finan	$ 100.00	0.5	$ 50.00	0.75	$ 37.50	$ 3.00	6.0%
Total Assets at Risk			**$ 450.00**		**$ 287.50**	**$ 23.00**	
% of Credit Risk							**5.1%**
% of Balance Sheet Assets							**7.67%**

Rotman
UNIVERSITY OF TORONTO

Capital Definitions

- Definitions of capital
- *Tier I*
  - Common equity and non-cumulative perpetual preferreds
  - Essentially no cash commitments in an emergency
- *Tier II*
  - subordinated debentures and cumulative preferreds
- Capital Requirement
  - 8% of Risk Weighted Assets
  - minimum of 50% (or 4% of RWA) as Tier I capital

Rotman
UNIVERSITY OF TORONTO

Capital Adequacy Requirements

The Bank Act requires the Bank to maintain adequate capital in relation to its operations. The Superintendent has established risk-based capital targets for Canadian chartered banks of 7% (Tier 1 Capital) and 10% (Total Capital). The Superintendent has issued guidelines concerning the maintenance of adequate capital (the “Capital Guidelines”) and has statutory authority pursuant to subsection 485(3) of the Bank Act to direct the Bank to increase its capital even if the Bank is in compliance with the Capital Guidelines. The Bank has no reason to believe that the Superintendent intends to direct the Bank to increase its capital. Pursuant to the Capital Guidelines, requirements are applied to the Bank on a consolidated basis including all subsidiaries except insurance subsidiaries or other regulated financial institutions whose leverage is inappropriate for a deposit taking institution and which, because of their size, would have a material impact on the leverage of the consolidated entity.

The following table sets forth the risk-based Tier 1 Capital ratios and risk-based Total Capital ratios of the Bank as at the dates indicated:

	Risk-Based Tier 1 Capital Ratio	Risk-Based Total Capital Ratio
January 31, 2008(1)	9.8%	11.2%
October 31, 2007	9.4%	11.5%
October 31, 2006	9.6%	11.9%
October 31, 2005	9.6%	13.1%
October 31, 2004	8.9%	12.4%
October 31, 2003	9.7%	12.8%
October 31, 2002	9.3%	12.7%

(1) Effective the first quarter of 2008, capital ratios are calculated using guidelines issued by the Office of the Superintendent of Financial Institutions (OSFI) under the new Basel II framework. Comparative capital ratios are calculated using guidelines issued under the Basel I framework.

Source: RBC prospectus March 2008

Bank Management

- Reserves
  - Settlement balances at the Bank of Canada
  - Canadian banks hold liquid assets to supplement their settlement balances: *liquidity management*
- Assets
  - Loans involve
    - Credit risk: possibility of default
    - Interest rate risk
    - *Asset management*
- Liabilities
  - Different types of deposits
    - Current and savings accounts , whole deposits
    - *Liability management*
- Risk and permanent capital: Equity and long term debt: *capital adequacy*

Rotman UNIVERSITY OF TORONTO

Canadian vs. US Banking

- Branching
  - Canadian banks branch across Canada: geographic diversification
  - US had restrictions against branching beyond one state!
    - Canadian banks in US had to pick a state (BMO-Harris in Chicago Ill)
    - Fear of big New York "money centre" banks
- Government
  - Canadian banks regulated under the Bank Act with regular reviews (about every ten years)
  - US: Competition in regulation
    - Controller of the Currency (Federal)
    - Office of Thrift Supervision: Savings and loans like Washington mutual and National City and IndyMac
- Interest rate controls
  - Removed in 1961 Bank Act in Canada
  - Existed in US (Reg Q) until the 1980s: caused uncompetitive deposit rates forcing deposits out into money market funds controlled by the investment banks US IBs Goldman, Lehman, Merrill, Morgan and Bear much more important than Canadian equivalents

Rotman UNIVERSITY OF TORONTO

Banking Models

- Germany
  - Universal banks: do everything and can be owned by and invest in non-financial companies
- UK
  - Securities firms, insurance and banks OK,
  - Cannot own non-financial companies
- Japan
  - Can own non-financials;
  - Keiretsu or groups of closely linked companies
- US following Canada
  - 1999 allowed to own securities firms, trusts and some insurance through separate subsidiaries (Bank Holding Companies)
  - No to corporate ownership or investments

Rotman
UNIVERSITY OF TORONTO

Key Themes to Current crisis

1. USG policy to increase home ownership
2. Poor regulation of banks in US
3. Enormous liquidity in the financial system
4. Lax financial management of the mortgage market by banks: Securitisation
5. Housing bubble

Rotman
UNIVERSITY OF TORONTO

1: US Government Housing Policy

- Encouraged house ownership
- Fannie Mae and Freddie Mac encouraged to make high ratio mortgages

Fannie Mae, the nation's biggest underwriter of home mortgages, has been under increasing pressure from the Clinton Administration to expand mortgage loans among low and moderate income people and felt pressure from stock holders to maintain its phenomenal growth in profits.

NY Times September 30, 1999

- Peter Wallison of the American Enterprise Institute in a prescient remark noted

"From the perspective of many people, including me, this is another thrift industry growing up around us… If they fail, the government will have to step up and bail them out the way it stepped up and bailed out the thrift industry."

Rotman
UNIVERSITY OF TORONTO

2: US Government Regulation:

- Controller of the Currency (Big banks) vs Office of Thrift Supervision (OTS) Savings and loans:
  - Washington Mutual, Indy Mac, Country Wide all regulated by the office of Thrift Supervision (OTS)
    1) *"OTS adopted an aggressively deregulatory stance toward the mortgage lenders it regulated. It allowed the reserves the banks held as a buffer against losses to dwindle to a historic low."*
    2) OTS director James Gilleran lauded the banks for their role in providing home loans. "Our goal is to allow thrifts to operate with a wide breadth of freedom from regulatory intrusion"
    3) Summer 2003, leaders of four federal agencies overseeing the banking industry gathered to highlight the Bush administration's commitment to reducing regulation. They posed for photographers behind a stack of papers wrapped in red tape. The others held garden shears. Gilleran as OTS director hefted a chain saw.
- Gilleran was an impassioned advocate of deregulation. He cut a quarter of the agency's 1,200 employees between 2001 and 2004, even though the value of loans and other assets of the firms increased by half over the same period. Washington Post Nov 23, 2008
- Regulatory competition to the bottom as banks switched to OTS

Rotman UNIVERSITY OF TORONTO

2: US Government Regulation

- Some State agencies tried to reign in "predatory bank lending"
  - Lending large amounts at excessive rates to low income borrowers
  - Ohio was shot down by US courts where the C o C successfully argued in favour of "national standards"
- Georgia tried to impose standards and liability on originators of structured investment vehicles (SIVs)
  - Shot down in court
- Hotly contested as states did little to monitor mortgage brokers who originated many of the bad loans
- *Lots of Finger pointing going on in the US*

Rotman
UNIVERSITY OF TORONTO

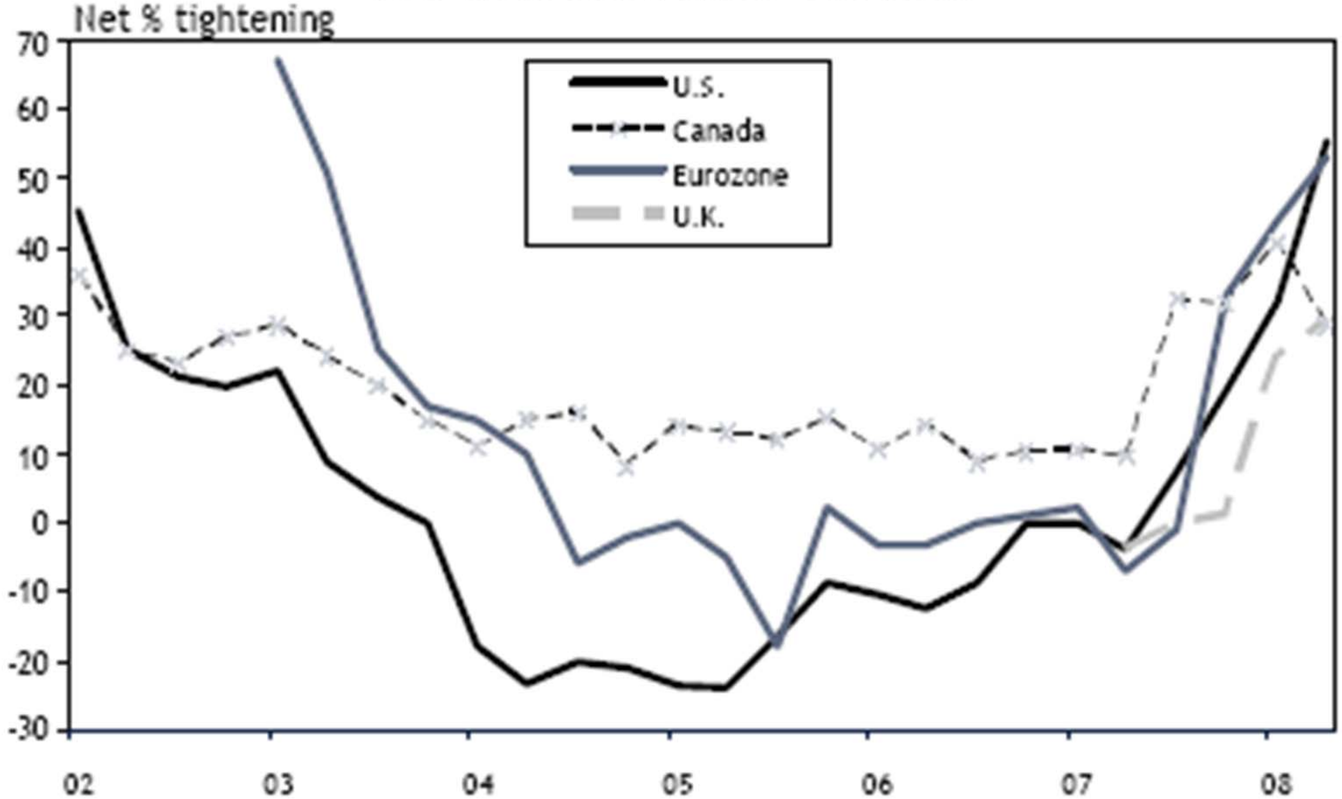
3: Liquidity

- Alan Greenspan Governor of the Fed kept interest rates low
- Massive US trade deficits and corresponding Chinese surplus, which was "hemmed in"
  - Could not buy real assets
  - Forced into T Bills and Agency bonds: Freddie Mac and Fannie Mae
- Business Week January 2007

"enormous amount of money sloshing around and the changing structure of the debt market. Foreign investors are shipping gobs of cash into the US……. Together these factors have combined to create unheard of pools of liquidity. Not only has that helped keep the lid on interest rates – holding debt payments down – it has also made funding readily available even for struggling companies."

Rotman UNIVERSITY OF TORONTO

Credit standards for nonfinancial firms



Source: U.S. Senior Loan Officer Survey, ECB Bank Leading Survey, BOE Credit Conditions Survey, BOC Business Outlook Survey, RBC Economics Research

4: Securitisation

- Originally Securitisation was to solve the US problem of lack of geographic diversification
  - Special form is asset backed commercial paper (*ABCP*)
  - Put securities into a trust or *special investment vehicle* (SIV)
- Issue commercial paper to finance the purchase of the securities
  - Generally over-collateralised, that is, put 110% worth of securities into a trust
  - Often have some form of guarantee or deficiency agreement so someone else absorb some losses of they occur
  - Underlying assets are generally low risk loans, where they are *pooled* to reduce risk
  - Historic statistics on default rates used to judge the level of risk
- Mortgage backed securities (MBS) where payoff on mortgage goes to different traunches (Slices)

Rotman
UNIVERSITY OF TORONTO

The Money Market

- The money market deals with securities having a maturity of less than one year.
- These are *marketable* and highly *liquid* which means they can be converted to money (cash) at full value very quickly: they have high *moneyness*
  - Demand comes from big institutions and corporations who have excess cash or are reluctant to invest long term, so they look for very short term, safe, investments
  - Supply comes from major financial institutions who see it as a low cost source of funds
- Overnight rate is the key interest rate as it affects all short term rates
- Almost all securities are discount notes

Rotman
UNIVERSITY OF TORONTO

Discount Note

Issue Date
Date d'émission

MM / DJ / YA

GE Capital
Canada

DISCOUNT NOTE / *BILLET À ESCOMPTE* DN

Due Date
Date d'échéance

MM / DJ / YA

SPECIMEN

GENERAL ELECTRIC CAPITAL CANADA INC., for value received, hereby promises to pay on the Due Date to or to the order of
CAPITAL GÉNÉRALE ÉLECTRIQUE DU CANADA INC., pour valeur reçue, par les présentes, promet de payer à la date d'échéance à

at the main branch in Toronto, Vancouver, Calgary, Winnipeg and Montreal of The Bank of Nova Scotia, the sum of $
ou à son ordre, à la principale succursale à Toronto, Vancouver, Calgary, Winnipeg et Montréal de La Banque de Nouvelle-Écosse, la somme de $

, upon due presentation and surrender of this promissory note.
, sur présentation et remise du présent billet à ordre.

Countersigned as Issuing Agent for General Electric Capital Canada Inc.
Contresigné en qualité d'agent émetteur pour Capital Générale Électrique du Canada Inc.
THE BANK OF NOVA SCOTIA / *LA BANQUE DE NOUVELLE-ÉCOSSE*

Per / Par: ______________________
Authorized Officer / *Signataire autorisé*

THIS PROMISSORY NOTE SHALL BECOME VALID ONLY WHEN MANUALLY COUNTERSIGNED BY A DULY AUTHORIZED OFFICER OF THE ISSUING AGENT.
LE PRÉSENT BILLET À ORDRE N'EST VALIDE QUE LORSQU'IL A ÉTÉ CONTRESIGNÉ À LA MAIN PAR UN SIGNATAIRE DÛMENT AUTORISÉ DE L'AGENT ÉMETTEUR.

000000

GENERAL ELECTRIC CAPITAL CANADA INC.
CAPITAL GÉNÉRALE ÉLECTRIQUE DU CANADA INC.

Per:
Par:
President / *Président*

Per:
Par: D Peter Donovan
Vice-President & Comptroller / *Vice-président et contrôleur*

Canadian Money Market

Table 2: Composition of the Short-Term Debt Market

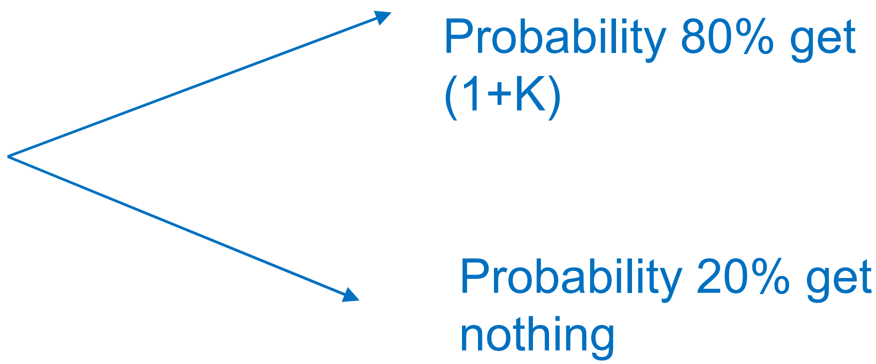
($ millions)	Dec. 2007	Dec. 2006	Dec. 2005	Dec. 2004	Dec. 2003	Dec. 2002	Dec. 2001
Corporates	38,338	54,863	48,169	47,089	40,884	46,617	53,244
Securitizations	75,714	106,874	82,933	65,360	63,077	63,276	60,713
Bankers' Acceptances	59,531	52,530	39,059	32,524	32,274	37,360	44,287
Sub-total Non-Government	**173,583**	**214,268**	**170,162**	**144,973**	**136,235**	**147,253**	**158,245**
Prov. / mun. gov't & agencies	21,991	16,243	13,821	18,771	21,246	21,109	18,236
Federal gov't agencies	16,148	15,211	11,407	10,494	9,833	11,460	11,462
Canada Treasury bills	115,800	124,700	127,100	117,050	116,800	104,350	95,000
Sub-total Government	**153,939**	**156,153**	**152,328**	**146,315**	**147,878**	**136,918**	**124,697**
Total	**327,522**	**370,421**	**322,490**	**291,288**	**284,113**	**284,172**	**282,942**

Commercial Paper

- Promissory notes issued by a company rather than government, for example GECC,
- Problem: corporations can *default* that is not meet their financial obligations
  - However, investors are not really "investing" they are simply "parking" cash for a short period of time
  - Investors in CP are unwilling to accept any risk:
    - Time horizon is very short
    - Amounts invested are very large
    - Yields are very low relative to default free T Bill yields
- Since CP is supposed to be have low default risk any fear of default causes a *"flight to quality"* as investors refuse to *roll over* CP and there is a *liquidity crisis*

Default Risk

- Suppose the default free yield on a one year note is 10% and there is a 20% chance of default and you get nothing, what is the break-even interest rate?



- Answer K=37.%: 0.80* 1.375 + 0.20* 0= 1.1
- This would be a 27.5% *credit spread*: the difference between the yield on a default risky security and the equivalent maturity government security
- Actual credit spread on Aug 14 was 0.72%, normally it is 20-30 basis points

Rotman UNIVERSITY OF TORONTO

Risk Assessment

- *Securities legislation* protects investors and makes sure:
  - all information is known about an issuer (more later on equities and prospectuses)
  - Prices are not manipulated
  - Criminals can not sell securities (registration requirement)
  - People in the business are well trained (CSC)
- Traditionally CP could not be sold to uninformed retail investors, the minimum investment was at least $50,000-$97,000, depending on the province.
- In 2005 this limit was removed and instead CP could be sold to anyone as long as it had the highest *credit rating*
- The Dominion Bond Rating Service (DBRS) is the major Canadian rating agency

Canadian Securisations rated R-1 (high)!

(b) Total Outstandings – % by Credit Rating	Dec. 2006	Dec. 2005
Corporates		
R-1 (high)	13.4%	7.6%
R-1 (middle)	13.1%	17.7%
R-1 (low)	8.1%	10.9%
R-2/NR	0.0%	0.2%
	34.5%	**36.5%**
Securitizations		
R-1 (high)	63.8%	61.5%
R-1 (middle)	1.3%	1.6%
R-1 (low)	0.3%	0.4%
R-2/NR	0.0%	0.0%
	65.5%	**63.5%**
Total – excludes governments/BAs	**100.0%**	**100.0%**

Note R-1 is equivalent (broadly) to A bond rating, there is very little BBB paper

Rotman UNIVERSITY OF TORONTO

Canadian Securitisations in 2006

Table 8: Securitization Outstandings by Seller Type

($ millions)	Dec. 2006	Dec. 2005	Dec. 2004	Dec. 2003	Dec. 2002	Dec. 2001	Dec. 2000
Multi-seller	103,851	80,799	61,925	58,639	55,821	51,486	49,996
Single-seller	2,848	3,188	3,513	4,629	7,792	9,812	9,586
Total short-term	106,699	83,987	65,438	63,268	63,613	61,298	59,582

Table 9: Market Share of Top Five Asset Classes

	Structured Financial Assets (CDO)	Auto Leases & Loans	Residential Mortgages	Equipment leases & loans	Trade receivables
December 2006	28.5%	25.2%	20.2%	5.9%	4.8%
December 2005	19.5%	24.6%	22.2%	7.6%	6.4%

Securitisation: US vs Canada

Financing of Mortgage Debt

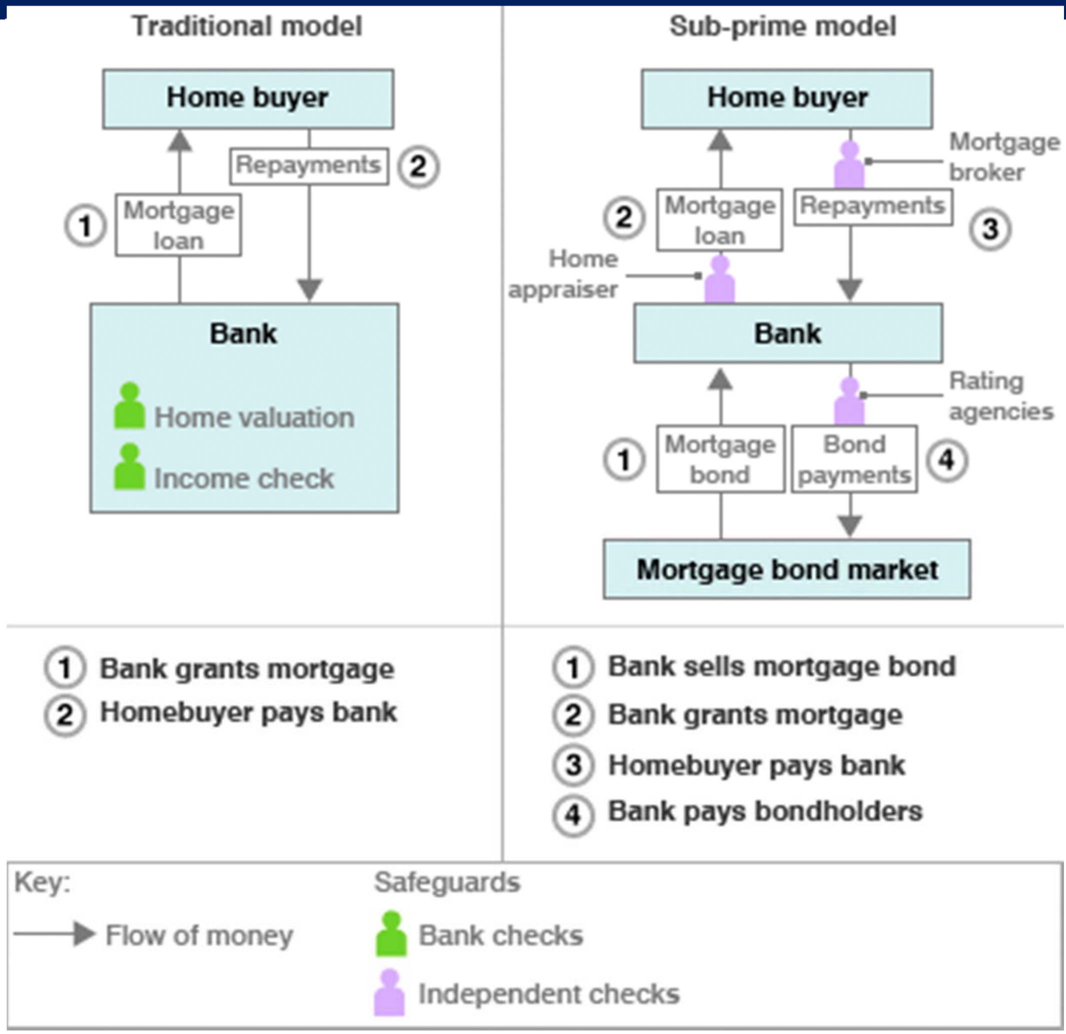
as at Dec. 31, 2007 ($billions)	Canada $	Canada %	U.S. $	U.S. %
Total Mortgage Debt Outstanding	$822.0	100%	$14,603.1	100%
On Bank Balance Sheets	$459.7	56%	$3,645.7	25%
On Other Regulated FI Balance Sheets	$175.7	21%	$3,575.7	24%
Off Balance Sheet/Securitized	$186.6	23%	$7,381.7	51%

•Most securitised debt in Canada is CMHC insured
US Sub prime originally about $1.4 trillion but now growing as house prices fall

•"shadow banking market"

Source: BMO FinServices: Banks Jul 22, 2008

4: Securitisation: Mortgages

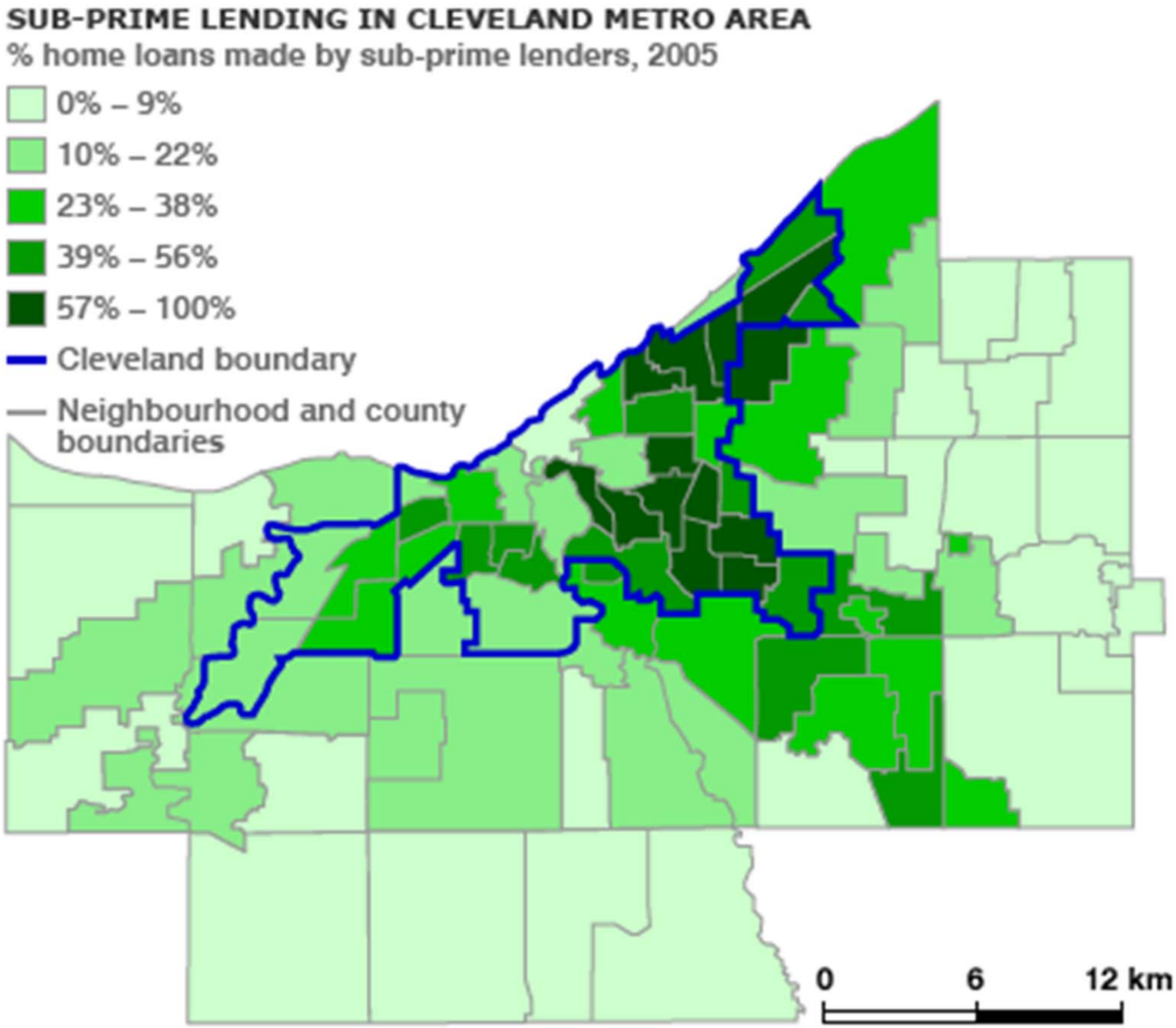


Source: BBC

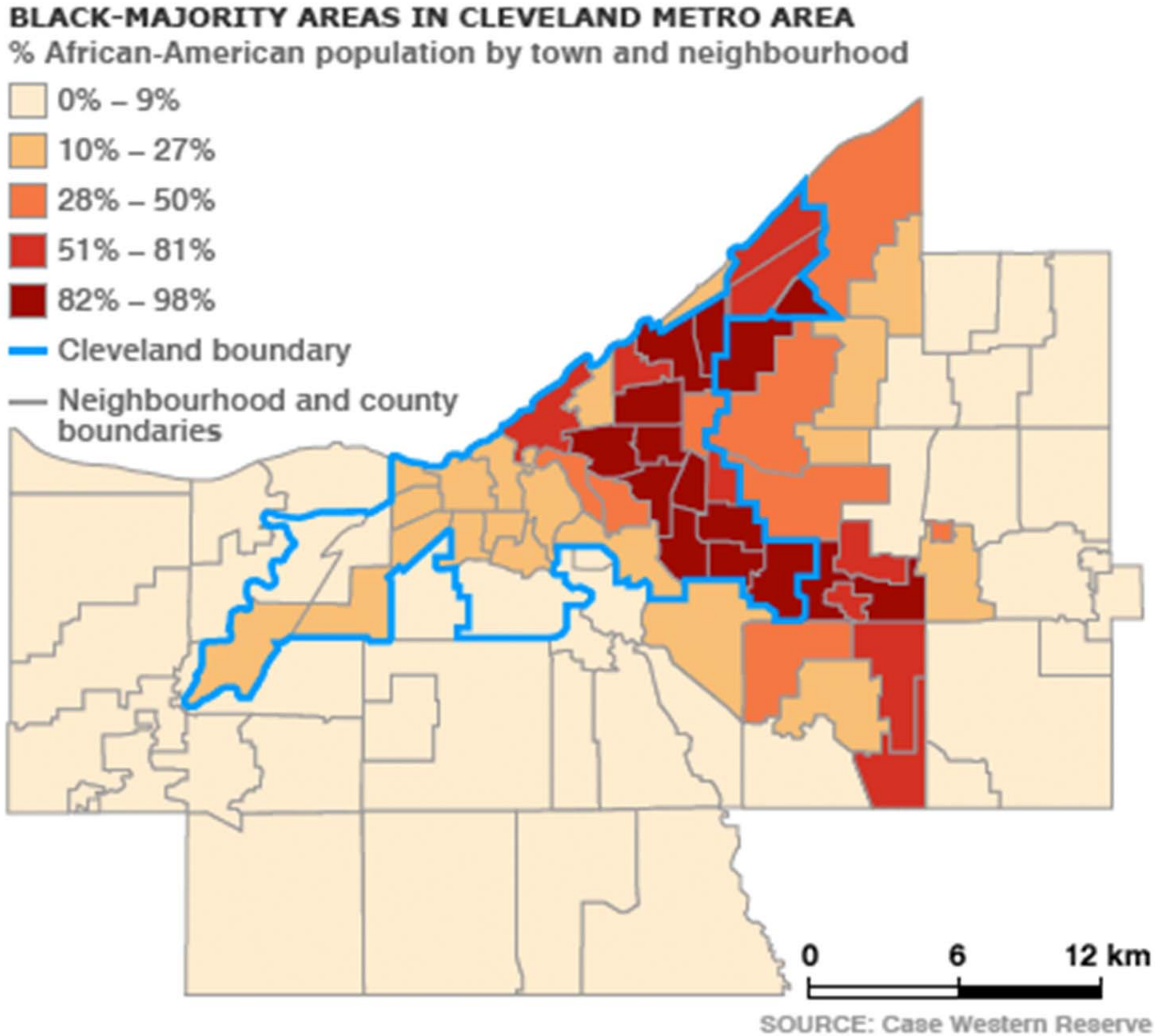
New Model: Moral Hazard

- Problems:
  - Broker originated mortgages
  - Borrower's credit scores were outsourced(FICO)
  - Incomes overstated
  - House values over stated (cash backs)
- Ninja loans: No Income, No job, no assets
- Structured Investment Vehicles packaged mortgages as investment grade for Sophisticated institutional purchasers thereby bypassed securities legislation

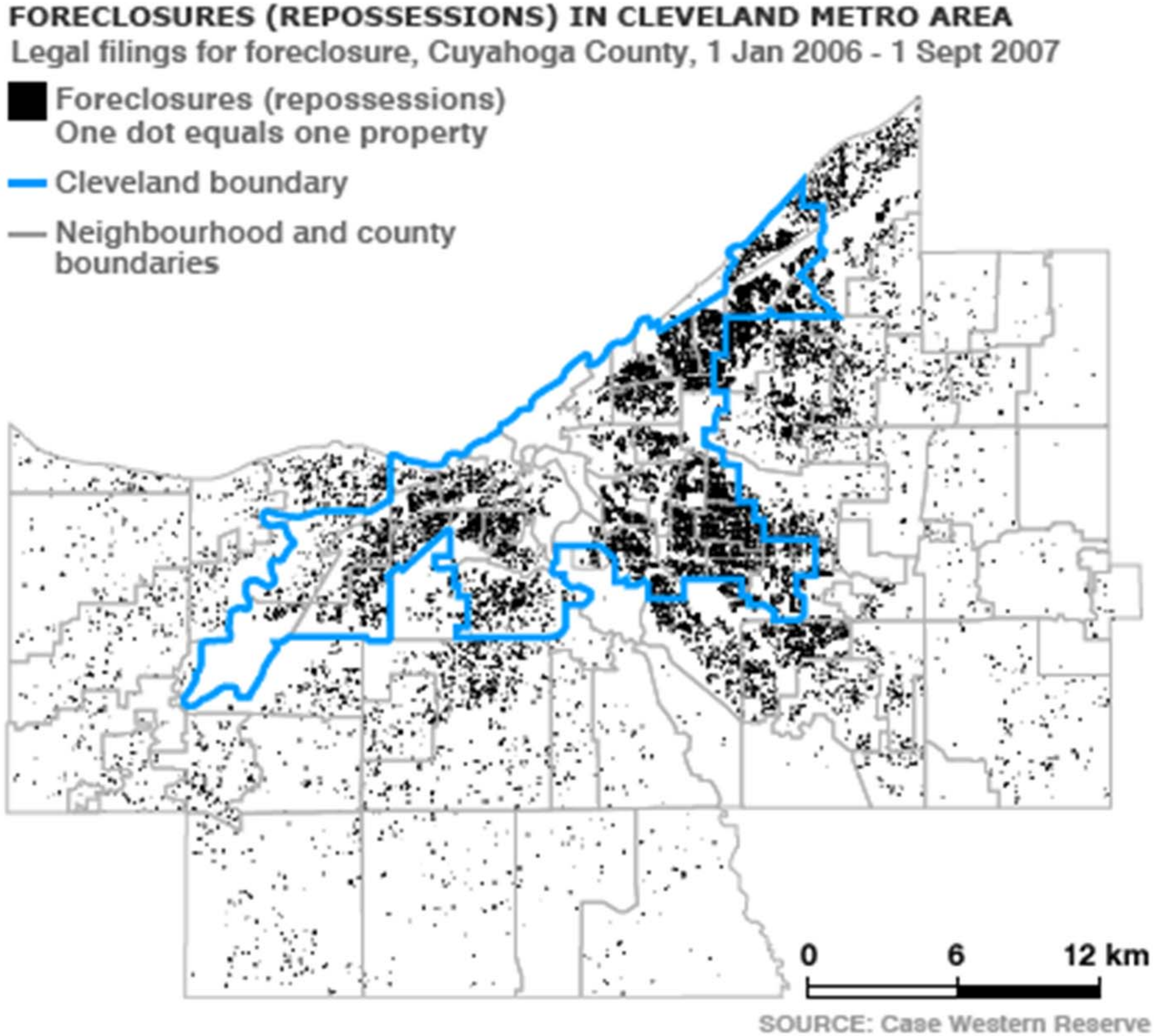
Rotman UNIVERSITY OF TORONTO



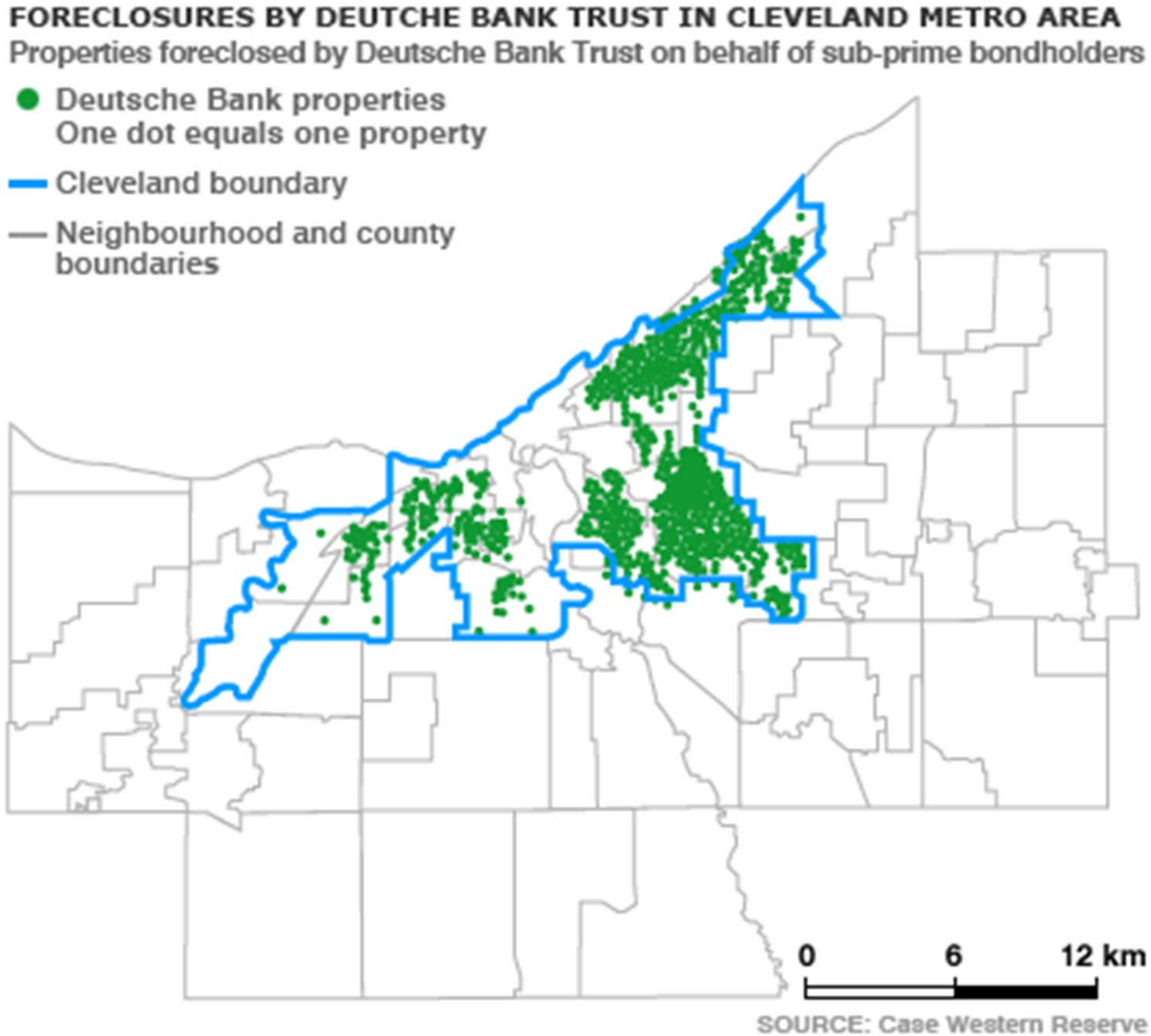
Rotman
UNIVERSITY OF TORONTO



Rotman
UNIVERSITY OF TORONTO

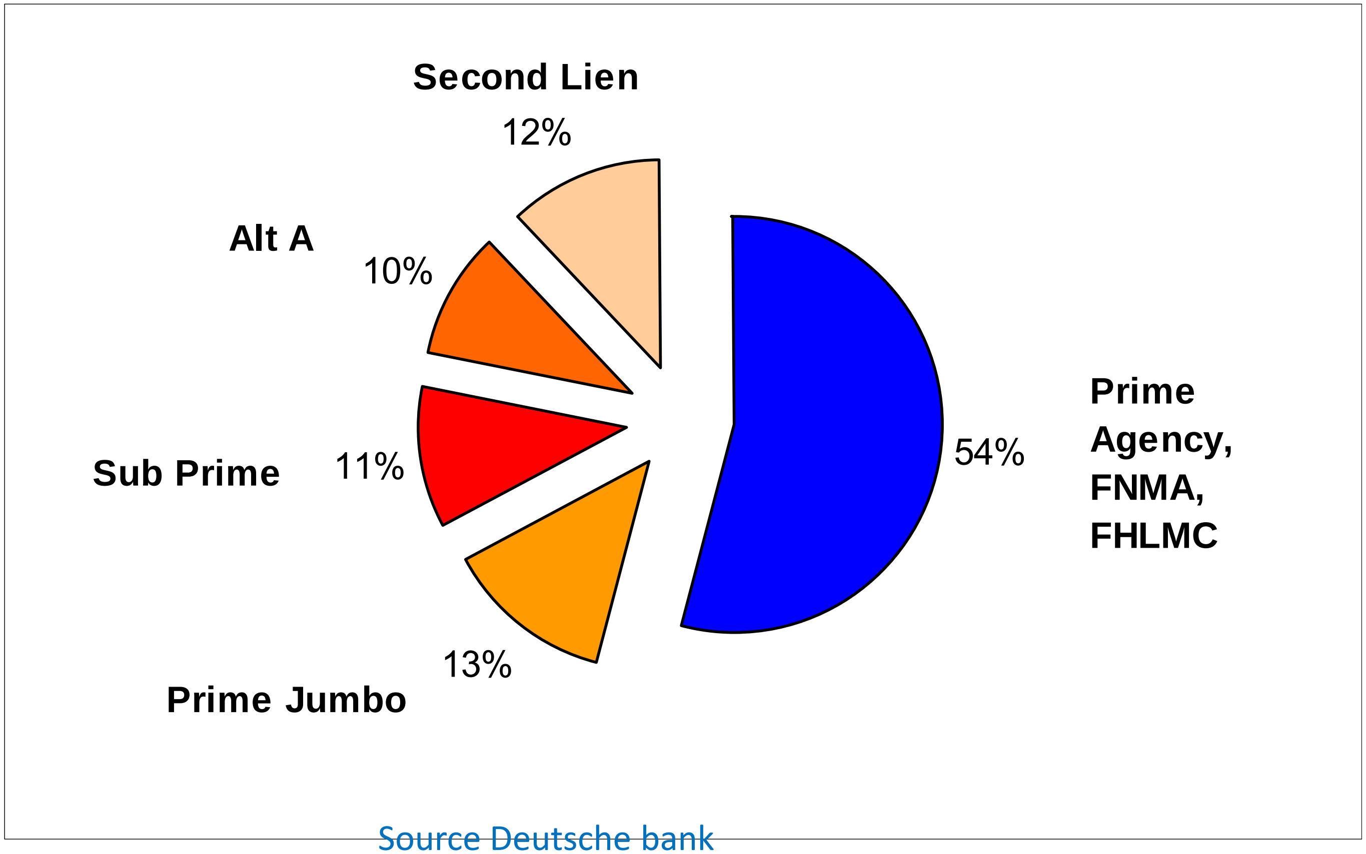


Rotman
UNIVERSITY OF TORONTO



Rotman UNIVERSITY OF TORONTO

Importance of US Sub-Prime Market



Source Deutsche bank

Alt A are non-conforming mortgages in between sub and prime.

Typical Securitisation

- Goldman Sachs, Spring 2006 issue (GSAMP Trust 2006-S3)
  - 8,274 California *second* mortgages, first mortgage generally for 80%
  - Second mortgagee can not *foreclose* if the payments are made on the first mortgage
  - Average equity 0.71% so 99.29% debt financed
  - 58% were no or low documentation mortgages
  - Many had teaser or low initial interest rates to get people to buy
  - Notional value $493 million
  - 93% was rated *investment grade*
  - Spread between CDO yields and mortgage rates was the cushion
- Spring 2007 18% were in default (expected rate 1%)
- August 2007 anything sub–prime related became *toxic*

Source: Fortune October 29, 2007

Rotman
UNIVERSITY OF TORONTO

http://data.newyorkfed.org/creditconditionsmap/

25% of sub prime are delinquent (over 90 days)
13% of near prime are delinquent
Governor E. Duke of the Fed Feb 16, 2009

Bank Responsibility

- 2005 Federal Reserve Board prohibited Citi from making acquisitions until it sorted out its risk management
- Decision was made to expand from within into collateralised debt obligations (CDOs)
- September 2007: Citigroup execs met to consider sub prime exposure
    - Prince (CEO) learned that Citi had $43 billion exposure
    - CDOs owned by Citi were "viewed by the *rating agencies* to have an extremely low probability of default (0.01%)"
    - Manager in charge stated "Citi would never lose a penny"
- November 2008 Citi wrote of $11 billion
- Since then 100's of billions of doubtful loans have come back onto Citi's books
- Citi's write –offs currently $124 billion

Rotman
UNIVERSITY OF TORONTO

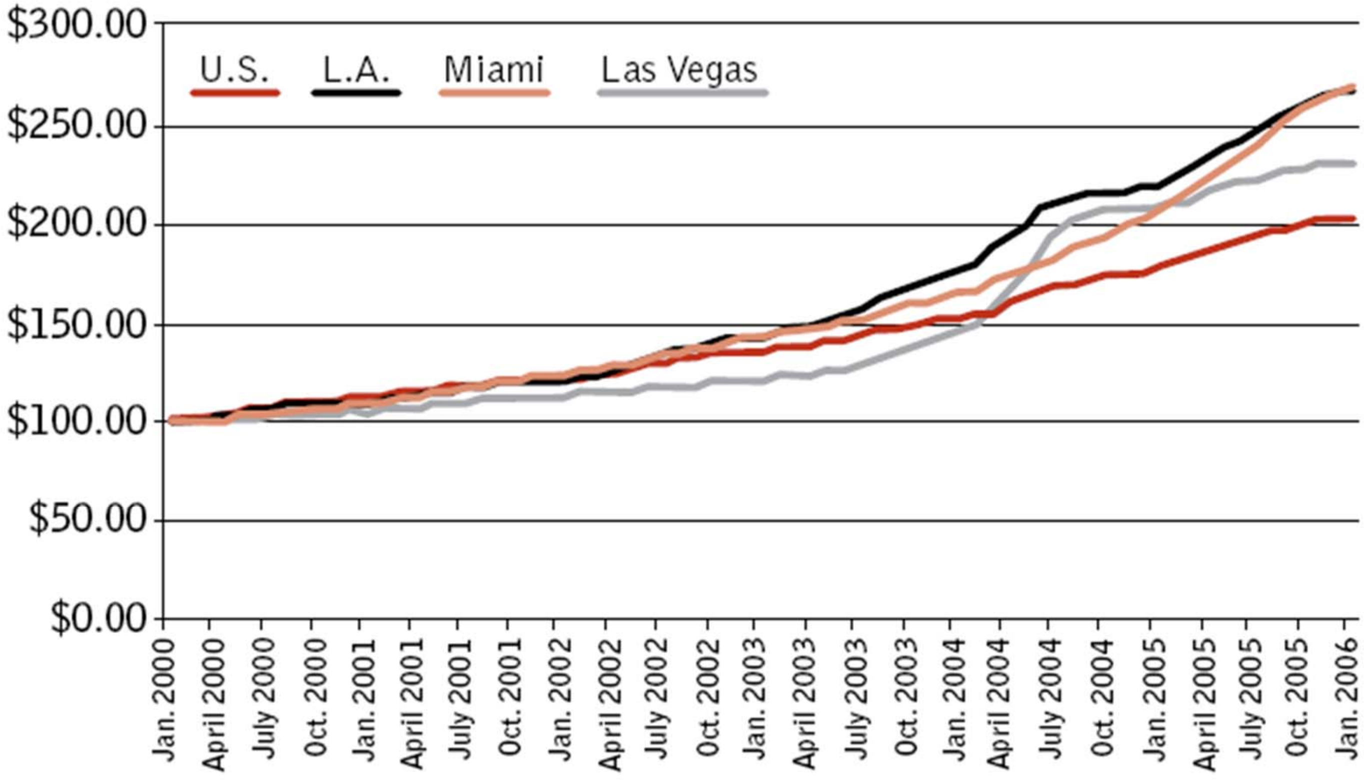
"There is really no excuse for institutions that specialize in credit risk assessment, like commercial banks, to rely solely on credit ratings in assessing credit risk,"

John Dugan, head of the office of the Comptroller of the Currency, main US bank regulator

Rotman
UNIVERSITY OF TORONTO

5: US House Prices Bubbled

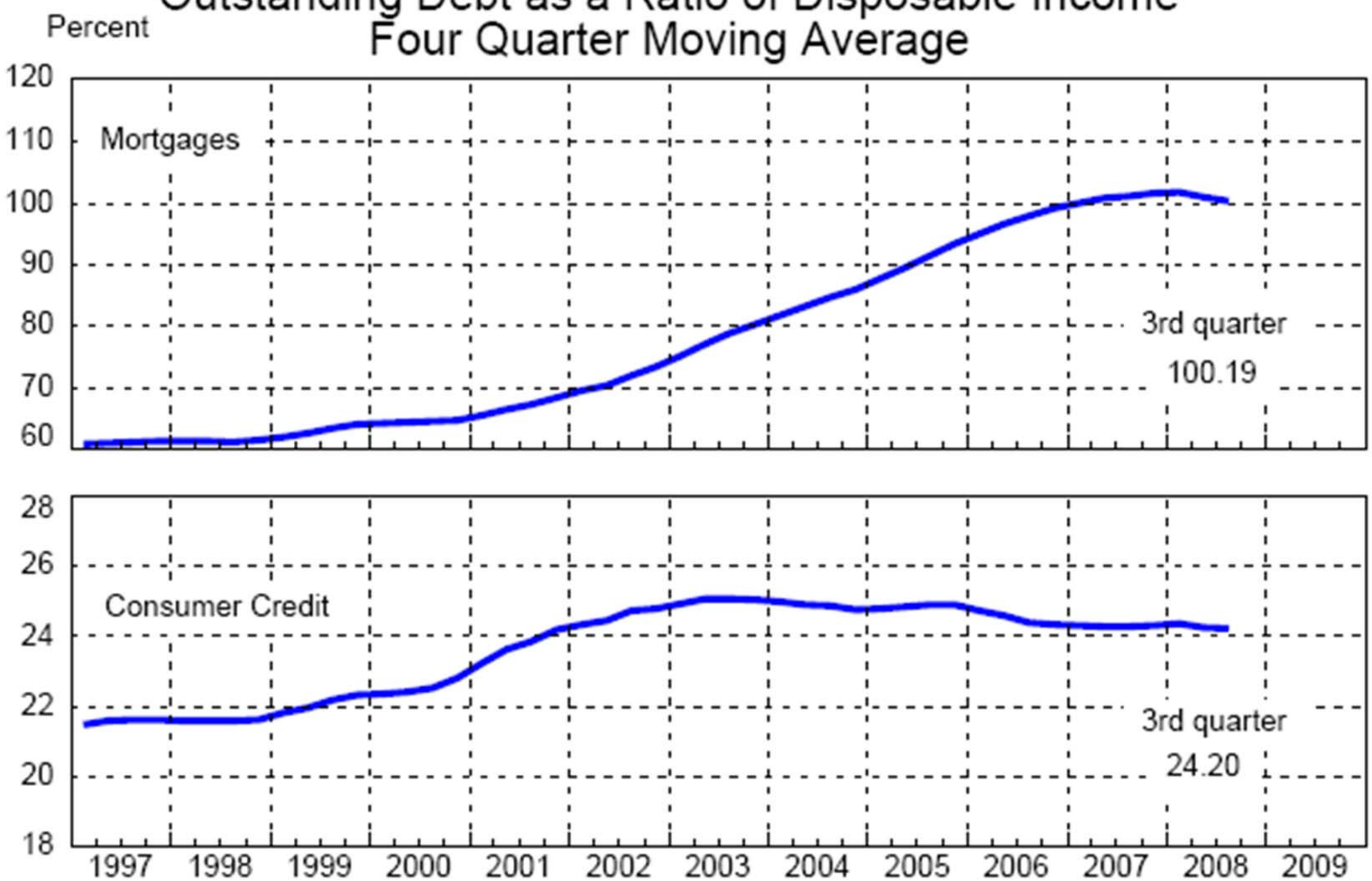
Figure 1: CASE-SHILLER INDEX OF U.S. HOUSE PRICES (2000-2006)



Rotman
UNIVERSITY OF TORONTO

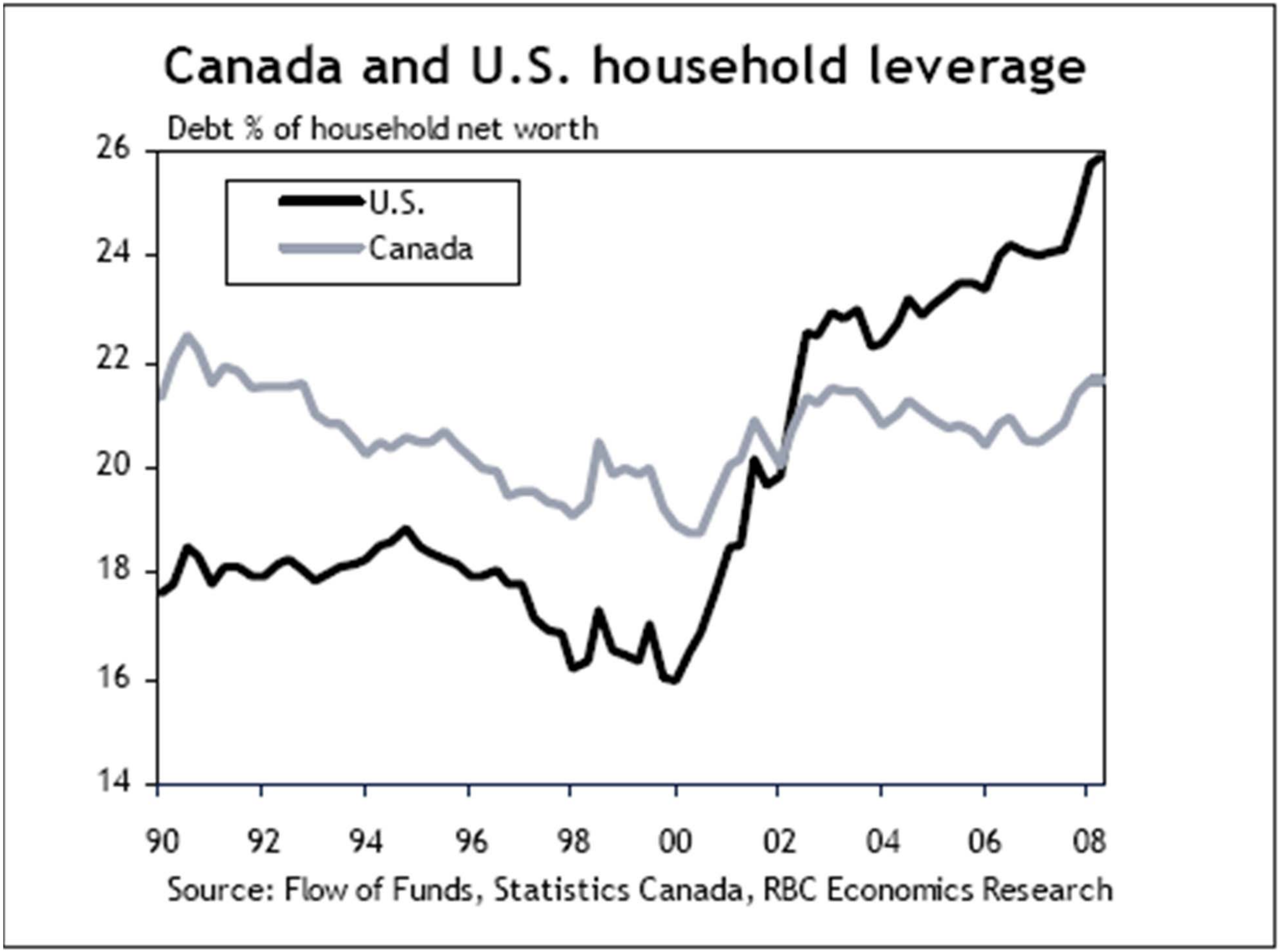
HOUSEHOLD DEBT BURDEN

Outstanding Debt as a Ratio of Disposable Income
Four Quarter Moving Average



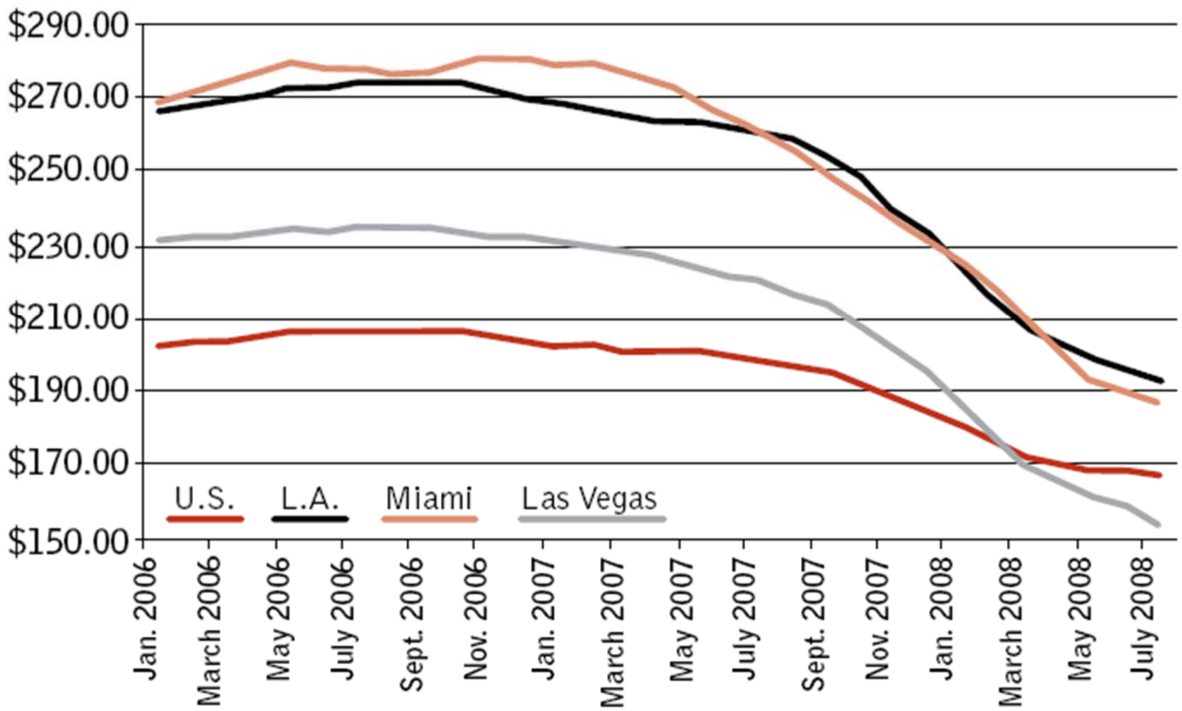
Source: Federal Reserve Board

Rotman
UNIVERSITY OF TORONTO



Rotman
UNIVERSITY OF TORONTO

Figure 2: CASE-SHILLER INDEX OF U.S. HOUSE PRICES (2006-2008)

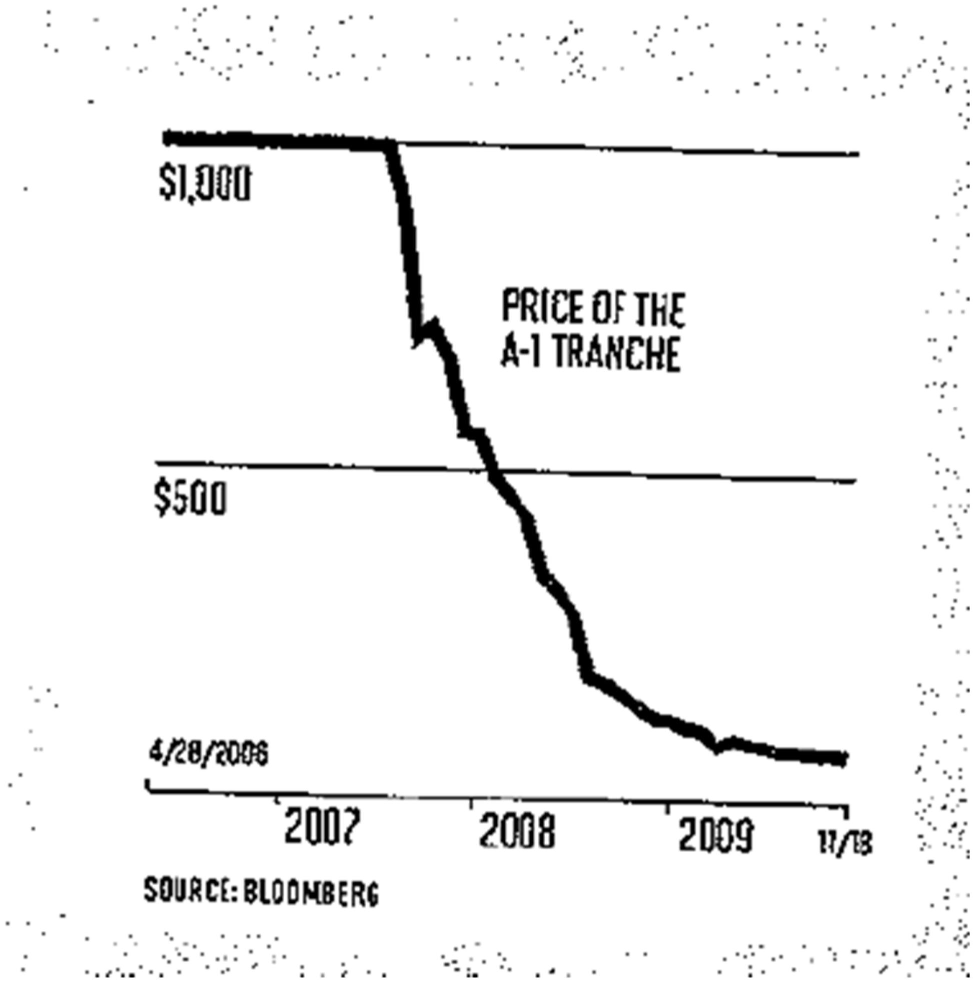


Miami	39.3%
Las Vegas	38.3%
Los Angeles	34.4%

GSAMP Trust 2006-S3

- Update to 2009 (Fortune Dec 21, 2009)
  - All the tranches rated below AAA have defaulted
  - 2 of the 3 AAA rated (A-2 and A-3)are suffering 90% losses
  - "Super senior" AAA (A-1)facing 25% losses
  - The A-2 and A-3 were trading (Dec 2009) at about 7% of face value

Look Out Below



Rotman
UNIVERSITY OF TORONTO

The Weekend (13/9/2008)

- Lehman told no bailout
- Goldman and Morgan Stanley seek protection as banks
- AIG bailed out
- Merrill sold to Bank of America
- Days following:
  - Citi lined up for Wachovia!
    - Eventually goes to Wells Fargo
  - JP Morgan eyes Washington Mutual
  - Reserve Fund breaks the buck due to Lehman debt
  - No-one trust the banks: who is next?
  - US T Bill yields turn negative
  - USG realises it made a mistake on Lehman: TARP

Loan Losses: Stress Tests

	US (SCAP) %	Canada (Veritas)
Prime mortgages:	7.0-8.5	0.11
Home equity lines:	12.0-16.0	0.125
Credit cards:	18.0-20.0	7.50
Commercial real estate:	9.0-12.0	6.00
Other consumer loans:	8.0-12.0	n/a
Other loans:	4.0-10.0	0.130

SCAP: Supervisory Capital Assessment Program, Overview of results May, 7, 2009

Veritas, Big 6 Canadian banks, May 13, 2009

Canadian Bank Loan Losses: 2

	Share	2007	2008 %	2009 (F)	2010 (F)	1990s
Residential mortgages:	*38.7*	0.01	0.01	0.10	0.175	*0.06*
Consumer loans:	*24.6*	0.98	1.08	1.40	1.75	*1.39*
Business & Govt:	*36.7*	0.09	0.48	1.35	1.70	*2.40*

1990s represented a very severe recession in Canada as the economy adjusted to a “Free Trade Agreement” with the United States

Source RBC, Industry Comment, May 4, 2009

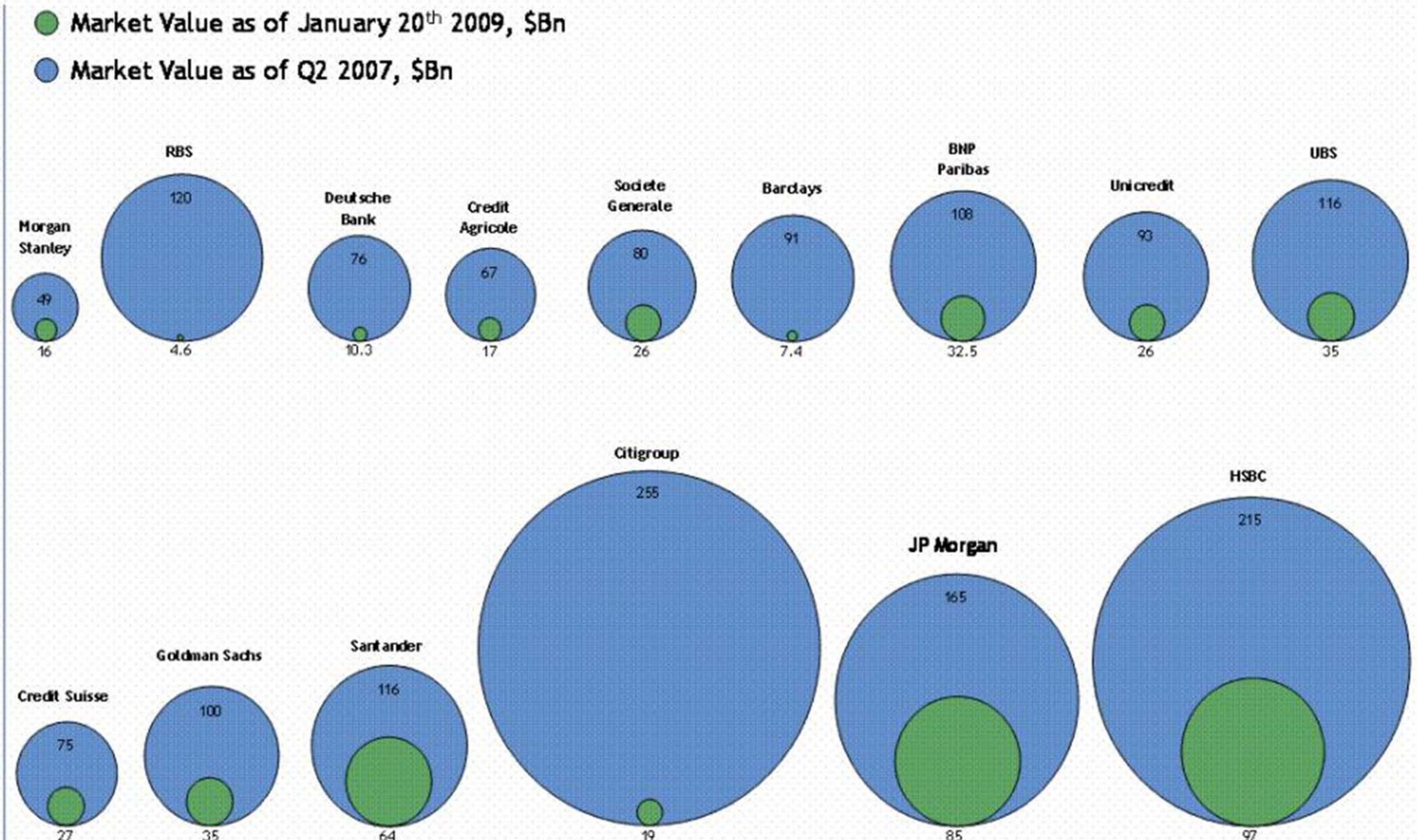
TOP 150 BANKS WORLDWIDE RANKED BY ASSET SIZE

Asset Rank 2007	Bank	Country (Year End)	Assets ($millions CDN)	Pre-Tax Profit ($millions CDN)	Pre-Tax Return on Assets (%)
1	**Royal Bank of Scotland**	United Kingdom (12/07)	3,762,578	19,600	0.52
2	**Deutsche Bank**	Germany (12/07)	2,938,770	12,726	0.43
3	**BNP Paribas**	France (12/07)	2,464,728	16,085	0.65
4	**Barclays Bank**	United Kingdom (12/07)	2,429,884	14,009	0.58
5	**HSBC Holdings**	United Kingdom (12/07)	2,326,250	23,924	1.03
6	**Credit Agricole Group**	France (12/07)	2,241,317	11,966	0.53
7	**Citigroup**	USA (12/07)	2,161,598	1,684	0.08
8	**UBS**	Switzerland (12/07)	1,995,145	-2,577	-0.13
9	**Mitsubishi UFJ Financial Group**	Japan (03/08)	1,795,942	10,078	0.56
10	**Bank of America Corp**	USA (12/07)	1,695,329	20,675	1.22
11	**Societe Generale**	France (12/07)	1,558,970	2,743	0.18
12	**JP Morgan Chase & Co**	USA (12/07)	1,543,557	22,534	1.46
13	**UniCredit**	Italy (12/07)	1,486,235	13,608	0.92
14	**Mizuho Financial Group**	Japan (03/08)	1,477,170	4,897	0.33
15	**ING Bank**	Netherlands (12/07)	1,446,022	6,479	0.45
16	**Banco Santander**	Spain (12/07)	1,327,913	15,870	1.20
17	**HBOS**	United Kingdom (12/07)	1,320,397	10,837	0.82
18	**Credit Suisse Group**	Switzerland (12/07)	1,194,569	12,070	1.01
19	**ICBC**	China (12/07)	1,174,653	15,607	1.33
20	**Fortis Bank**	Belgium (12/07)	1,115,977	2,086	0.19

BANK	2007	2008	2009 YTD	TOTAL
Citigroup (C.N)	29.1	63.4	30.7	$123.2
Wachovia Corp*	4.0	73.4		$77.4
Bank of America (BAC.N)	12.1	29.2	35.5	$76.8
Merrill Lynch**	25.1	38.6		$63.7
HSBC (HSBA.L)	19.3	30.3	13.9	$63.5
Lloyds (LLOY.L)&	6.8	28.9	22.3	$58.0
UBS (UBSN.VX)		50.6	1.8	$52.4
Royal Bk Scotland (RBS.L)	7.0	23.5	19.6	$50.1
Fannie Mae (FNM.N)	4.7	26.9	15.4	$47.0
JPMorgan Chase (JPM.N)	4.5	10.2	29.5	$44.2
Freddie Mac (FRE.N)	5.2	24.4	12.8	$42.4
Washington Mutual***	5.1	36.7		$41.8
Barclays (BARC.L)	7.0	16.5	12.7	$36.2
Wells Fargo (WFC.N)	3.5	8.7	18.2	$30.4
Lehman Brothers****	12.5	14.0		$26.5
Santander (SAN.MC)	4.8	8.3	13.2	$26.3
Morgan Stanley (MS.N)	10.3	10.1	2.4	$22.8
Commerzbank/Dresdner (CBKG.DE)	3.9	13.3	4.5	$22.3
BNP Paribas+ (BNPP.PA)	2.4	8.0	11.4	$21.8
Deutsche Bank (DBKGn.DE)	4.0	11.2	4.9	$20.1
IKB &&				$14.7
Credit Suisse (CSGN.VX)	3.5	11.9	0.5	$14.6
BBVA (BBVA.MC)	2.7	4.2	7.7	$14.6
National City*****				$14.0
Societe Gen+ (SOGN.PA)	1.3	3.7	7.9	$12.9
UniCredit (CRDI.MI)	3.5	5.1	2.4	$11.0
C.Agricole+ (CAGR.PA)	2.7	4.4	3.1	$10.2
ING (ING.AS)		7.1	2.4	$9.5
Bayern LB	1.1	8.0		$9.1
Intesa Sanpaolo (ISP.MI)	1.6	4.5	2.6	$8.7
Goldman Sachs (GS.N)	1.7	4.9	1.9	$8.5
Natixis+ (CNAT.PA)	2.0	2.5	3.1	$7.6
Canadian Imp Bk Commerce				$6.5
Erste Bank (ERST.VI)	0.8	2.5	1.3	$4.6
Standard Chartered (STAN.L)	0.8	1.8	1.1	$3.7
Bear Stearns******	3.0	0.6		$3.6
Fortis				$3.1
WestLB				$3.0
Rabobank	0.8	1.7		$2.5
Total				$1,119.3

Reuters Feb 18, 2010

Banks: Market Cap



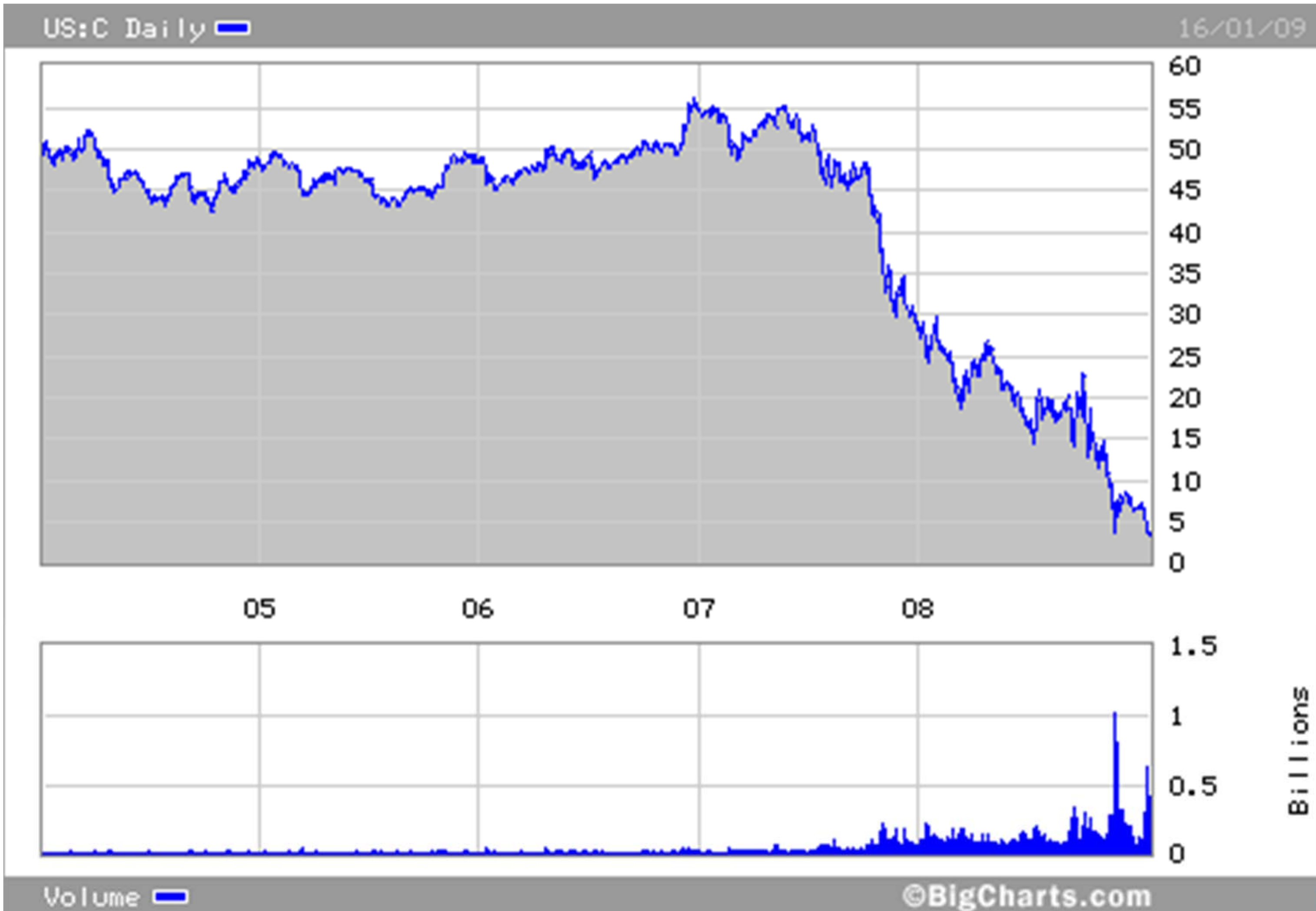
J.P.Morgan

While JPMorgan considers this information to be reliable, we cannot guarantee its accuracy or completeness

Source: Bloomberg, Jan 20th 2009

Rotman UNIVERSITY OF TORONTO

Citibank Stock Price

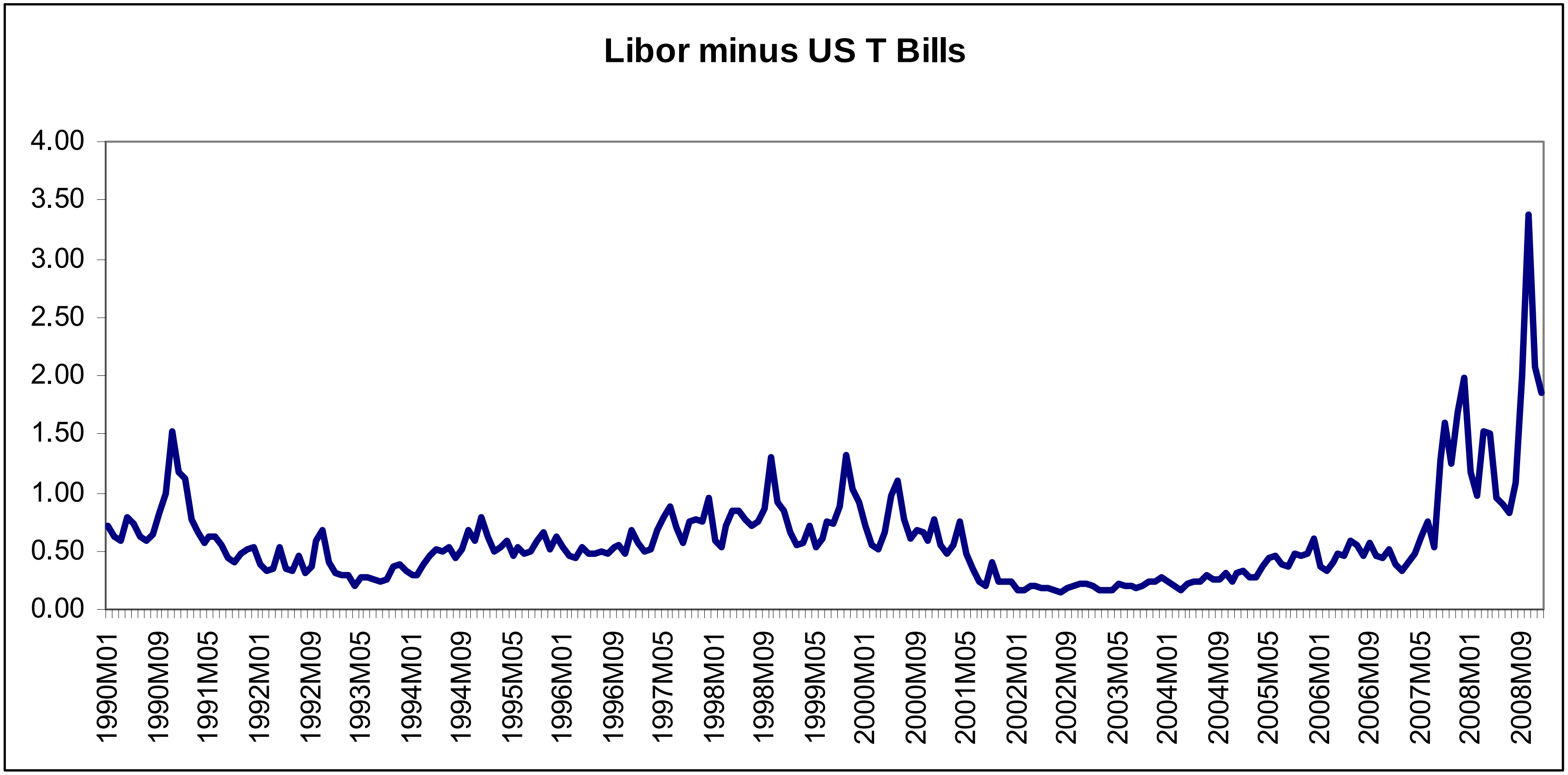


Credit Crunch

- Banks afraid to lend to each other
  - In the US this is serious, since so much is *disintermediated* and banks compete for funds in the money market
  - Canadian banks rely more heavily on deposits
- Credit crunch
  - *Credit destruction*: Deleveraging as banks try to preserve capital to avoid a bank run similar to that which brought down WashMU and Lehman Brothers
- Troubled Asset Relief Plan (TARP) $700 b bailout
  - $125 b to five major banks
  - $125 b to second tier banks
  - $200 b to insurance and others
- Designed to shore up bank capital and keep them solvent not increase lending

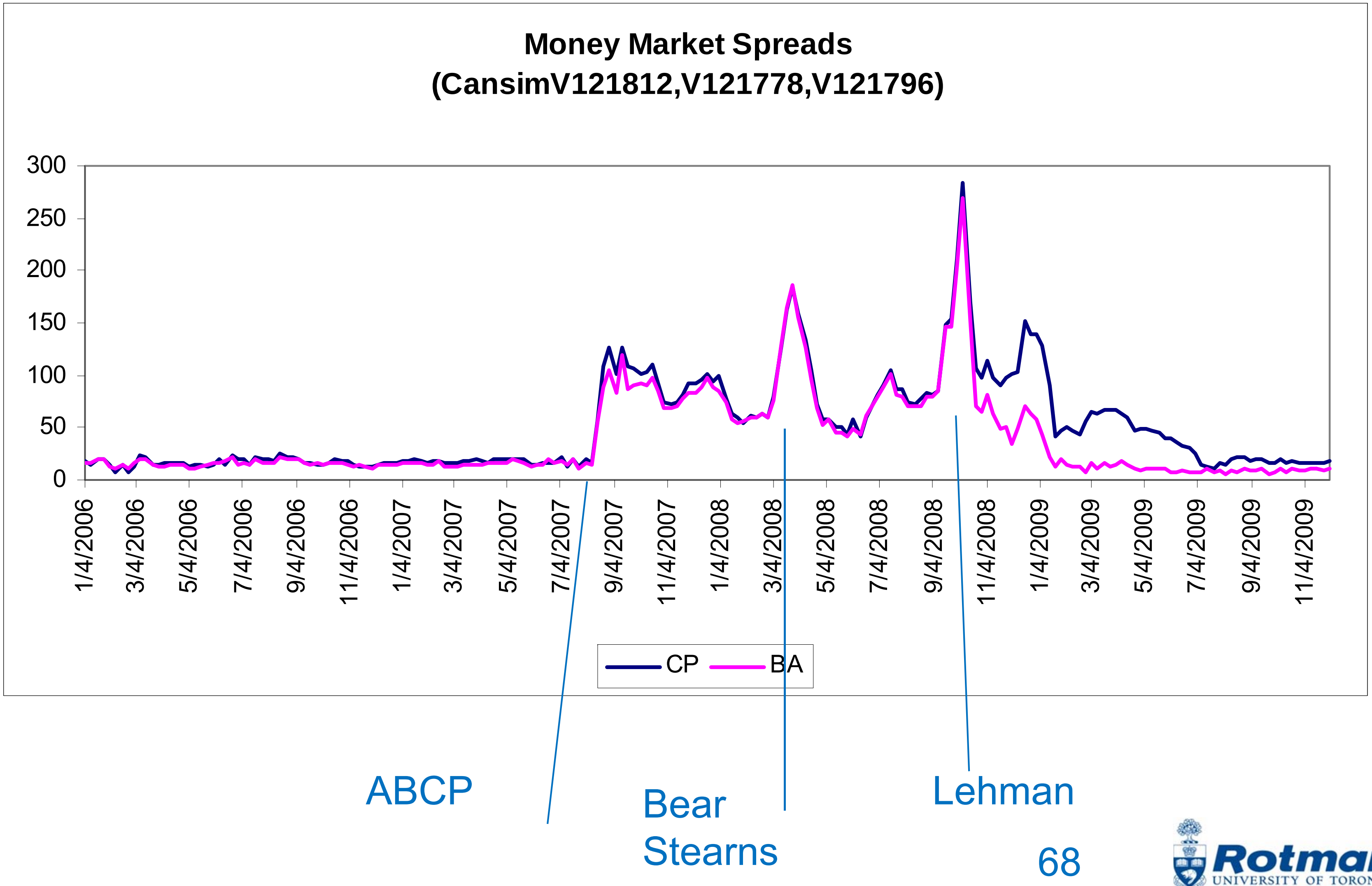
Rotman
UNIVERSITY OF TORONTO

TED Spread Panic!

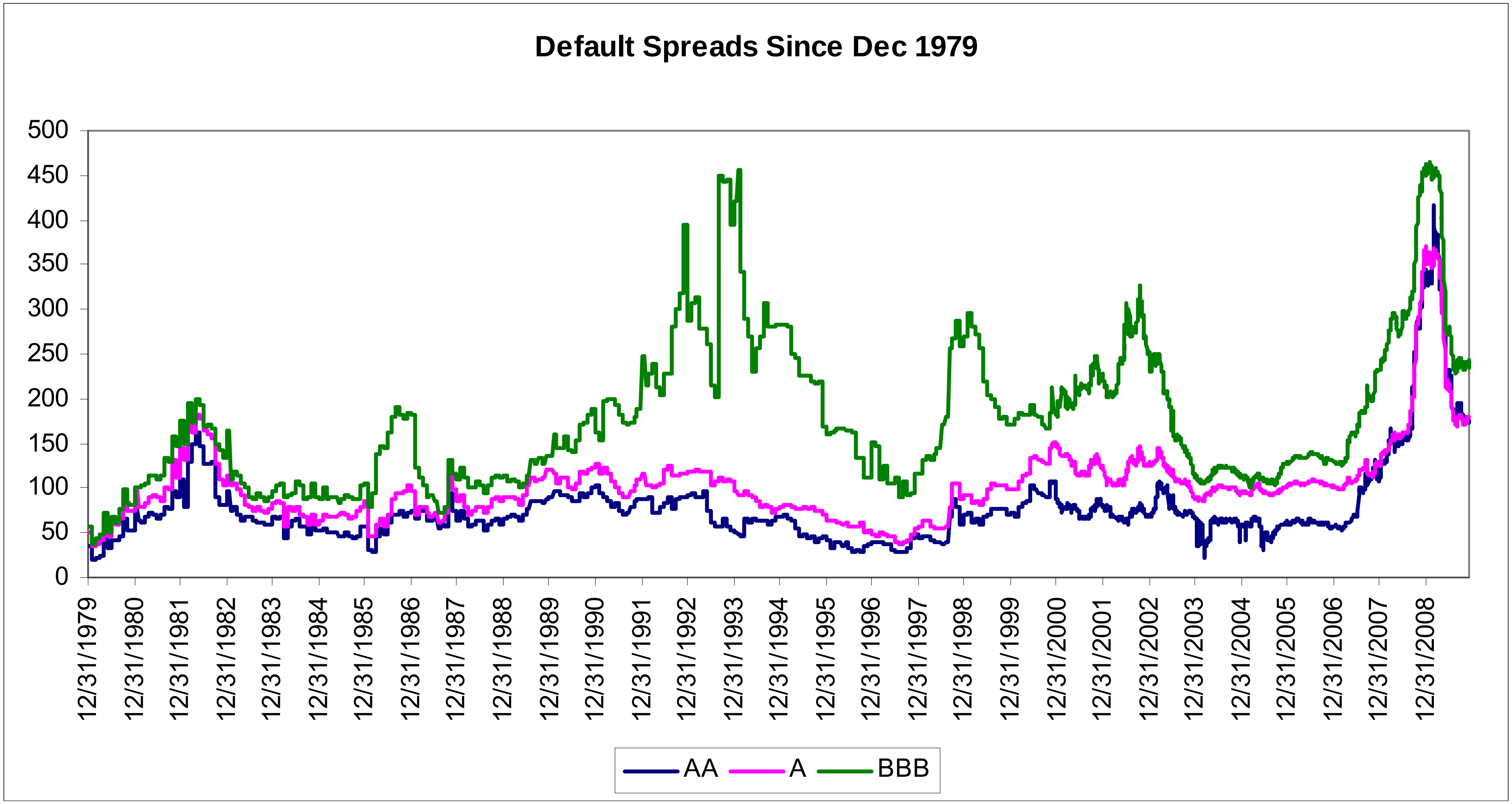


Rotman
UNIVERSITY OF TORONTO

Canadian Money Market



Rotman
UNIVERSITY OF TORONTO

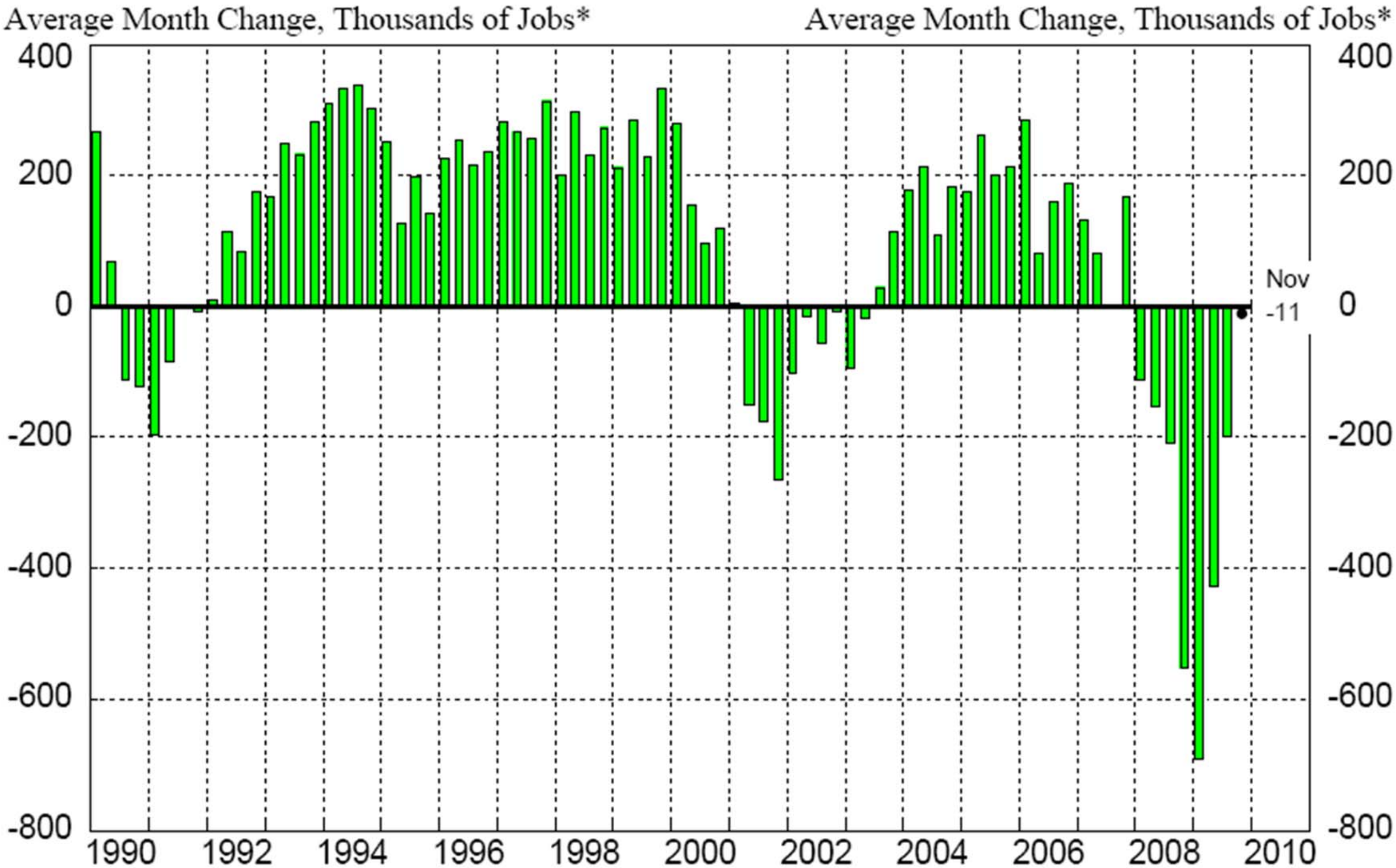


Massive spread increases for even good credits (A)

Banks restricted credit: preservation of capital

Rotman UNIVERSITY OF TORONTO

NONFARM PAYROLL EMPLOYMENT



* Average of the three monthly changes during the quarter.
Source: U.S. Department of Labor, Bureau of Labor Statistics

Result

- Declining house prices
- Declining stock market
- Rising unemployment

- *Massive Retrenchment*

  - *Major hit is consumer durables*

Rotman
UNIVERSITY OF TORONTO

Government Lends a Hand and $

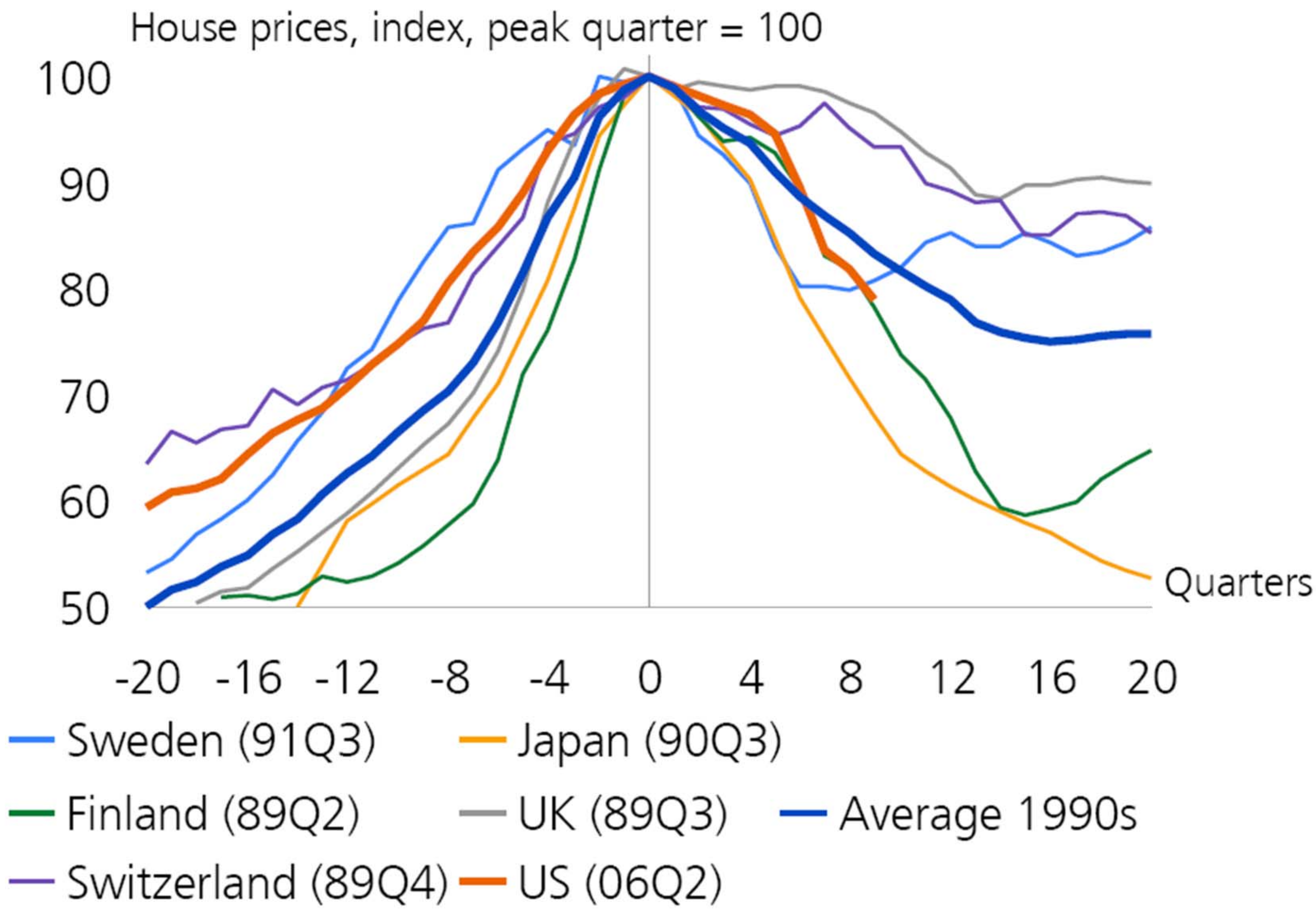
CONGRESS / TREASURY

- **Housing and Economic Recovery Act (HERA) – 7/30/2008**
  - Homeowners can refinance into FHA loans w principal write-down
- **FNM/FRE Conservatorship – 9/7/2008**
  - Government Sponsored Enterprise (GSE) Credit Facility
  - GSE Senior Preferred Stock & MBS Purchase Agreement
- **Guarantee Program for Money Market Funds – 9/19/2008**
  - Guarantees participating money funds from breaking the buck
- **Troubled Asset Relief Program (TARP) – 9/28/2008**
  - Capital purchase program to buy troubled assets or preferred shares from U.S banks and thrifts
- **Emergency Economic Stability Act (EESA) – 10/3/2008**
  - Creates the troubled asset program (TARP)
- **FDIC Deposit Insurance Limit Increase – 10/3/2008**
  - Increases Account Limit to $250,000 from $100,000
- **Temporary Liquidity Guarantee Program (TLGP) – 10/14/2008**
  - FDIC guarantees newly issued Senior Unsecured debt of banks, thrifts and certain holding companies
- **Term-Asset Backed Securities Loan Facility (TALF) – 11/25/2008**
  - Fed provides $200 Bn in loans to lend against AAA rated ABS
- **Expected Fiscal Stimulus Under Discussion**
  - Expected to include large infrastructure component

FEDERAL RESERVE

- **Term Auction Facility (TAF) – 12/12/2007**
  - Overnight loan facility that provides funding
- **Term Securities Lending Facility (TSLF) – 3/11/2008**
  - Provides loans over a 1-month term against eligible collateral
- **Primary Dealer Credit Facility (PDCF) – 3/16/2008**
  - Overnight loan facility funding a range of eligible collateral
- **Foreign Currency Swaps – 9/18/2008**
  - Unlimited currency swaps w central banks including ECB
- **Asset Backed Commercial Paper Money Market Fund Liquidity Facility (AMLF) – 9/19/2008**
  - Banks borrow from the Fed to purchase ABCP from money market funds at amortized cost and zero risk weighting
- **Commercial Paper Funding Facility (CPFF) – 10/7/2008**
  - The Fed buys 3-month commercial paper from Tier 1 issuers
- **Money Market Investor Funding Facility (MMIF) – 10/21/2008**
  - Fed buys CP, bank notes and CDs to 90 days maturity from money market funds
- **GSE Debt and MBS Purchase Program – 11/25/2008**
  - Fed buys Fannie, Freddie & Home Loan Debentures and Agency MBS

US housing market, where do we stand? Bottoming out in 2-3 quarters

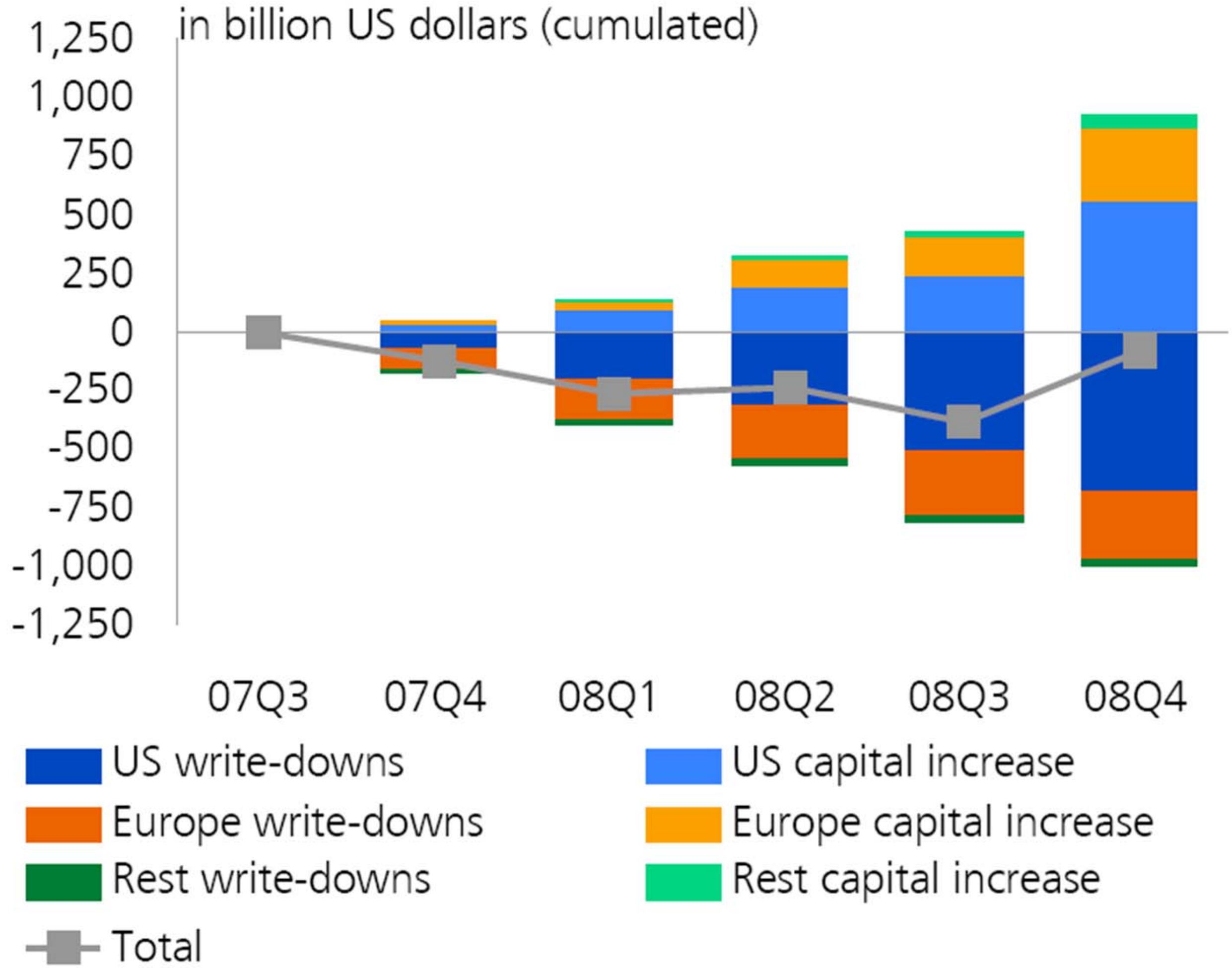


UBS

Source: Thomson financials, UBS WMR

Rotman
UNIVERSITY OF TORONTO

Financial crisis, where do we stand? Write-downs and capital increases



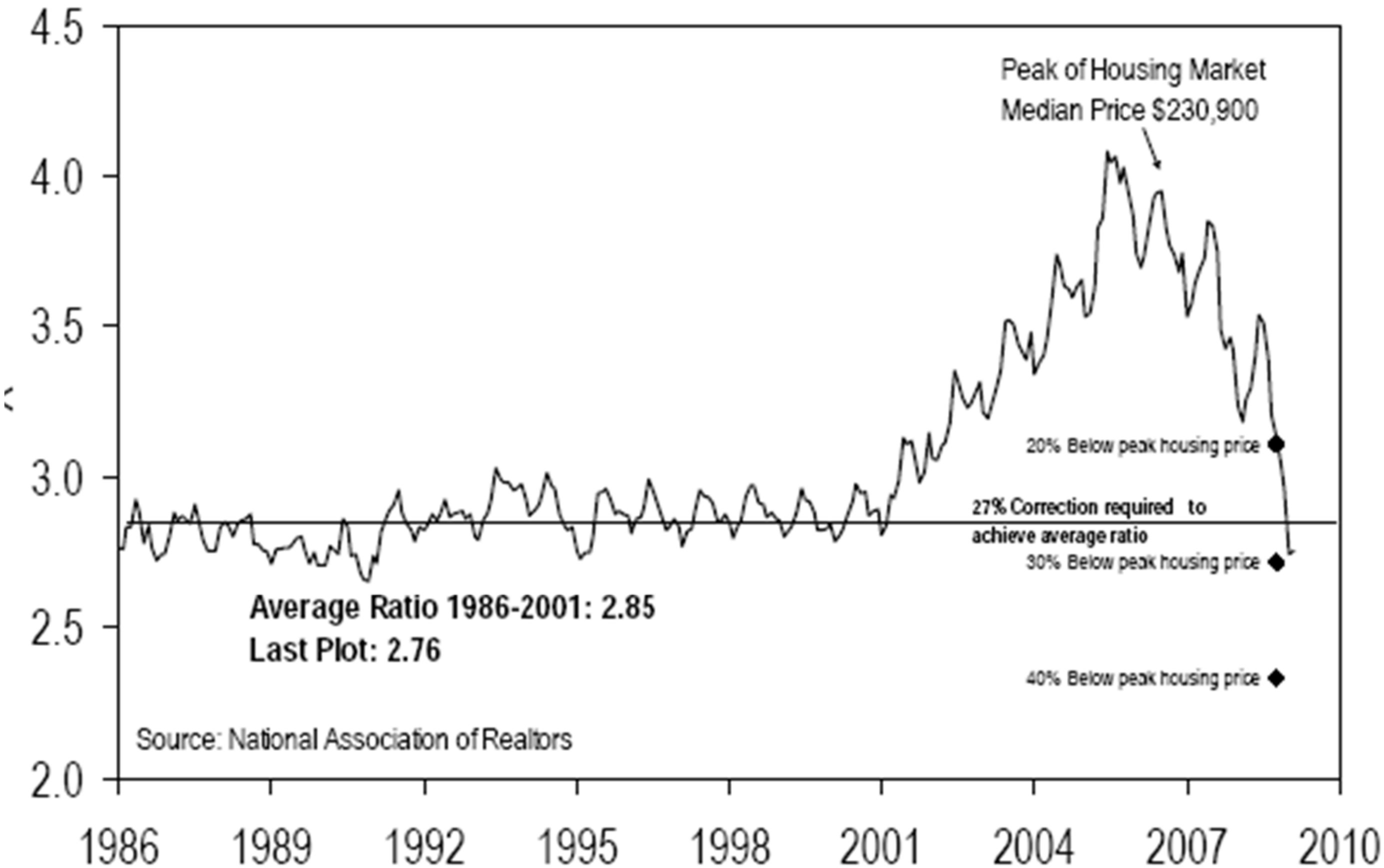
Source: Natixis, Bloomberg

UBS

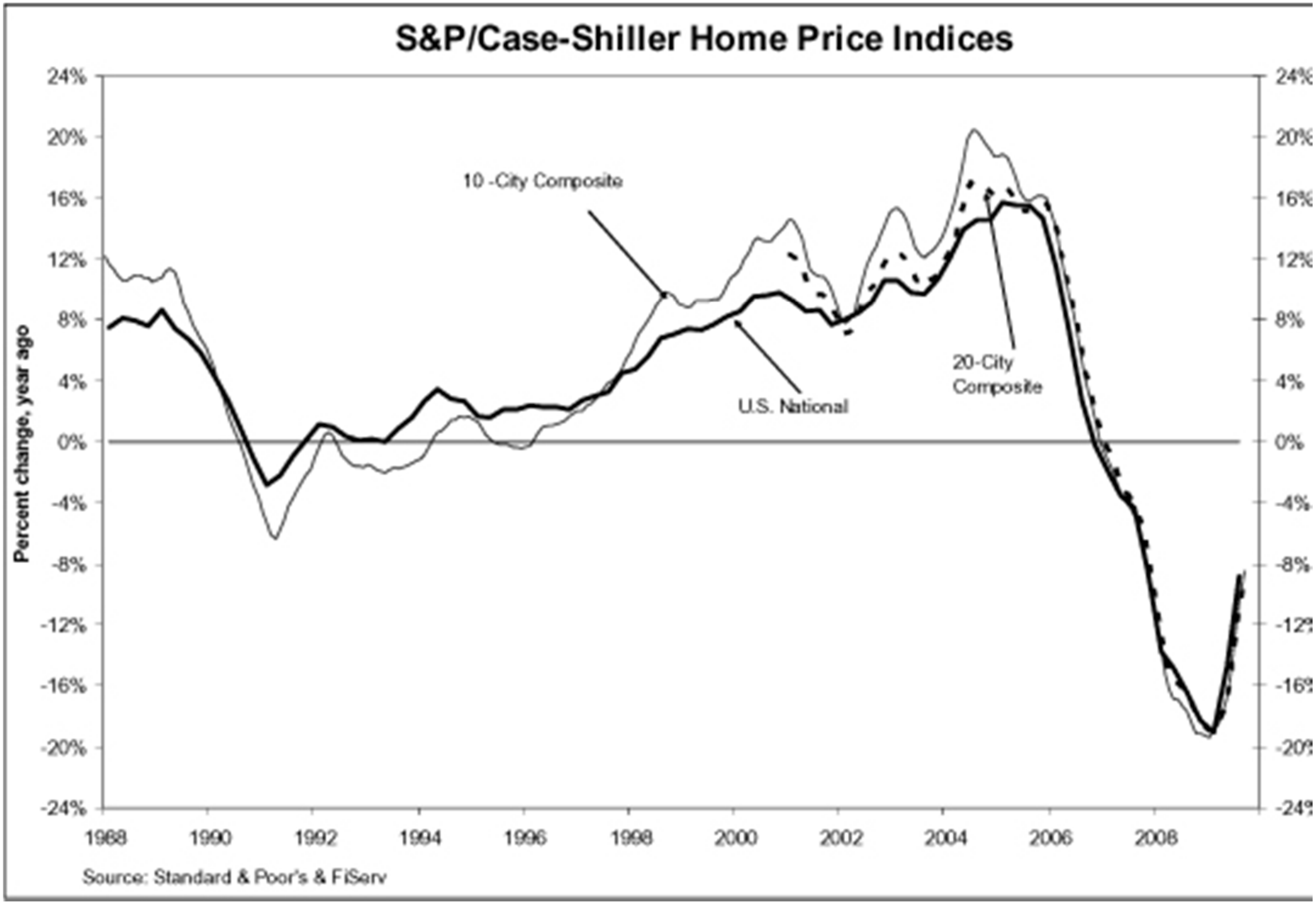
Rotman UNIVERSITY OF TORONTO

Home Prices as a Multiple of Median Household Income

Existing House Price Divided by Median Income

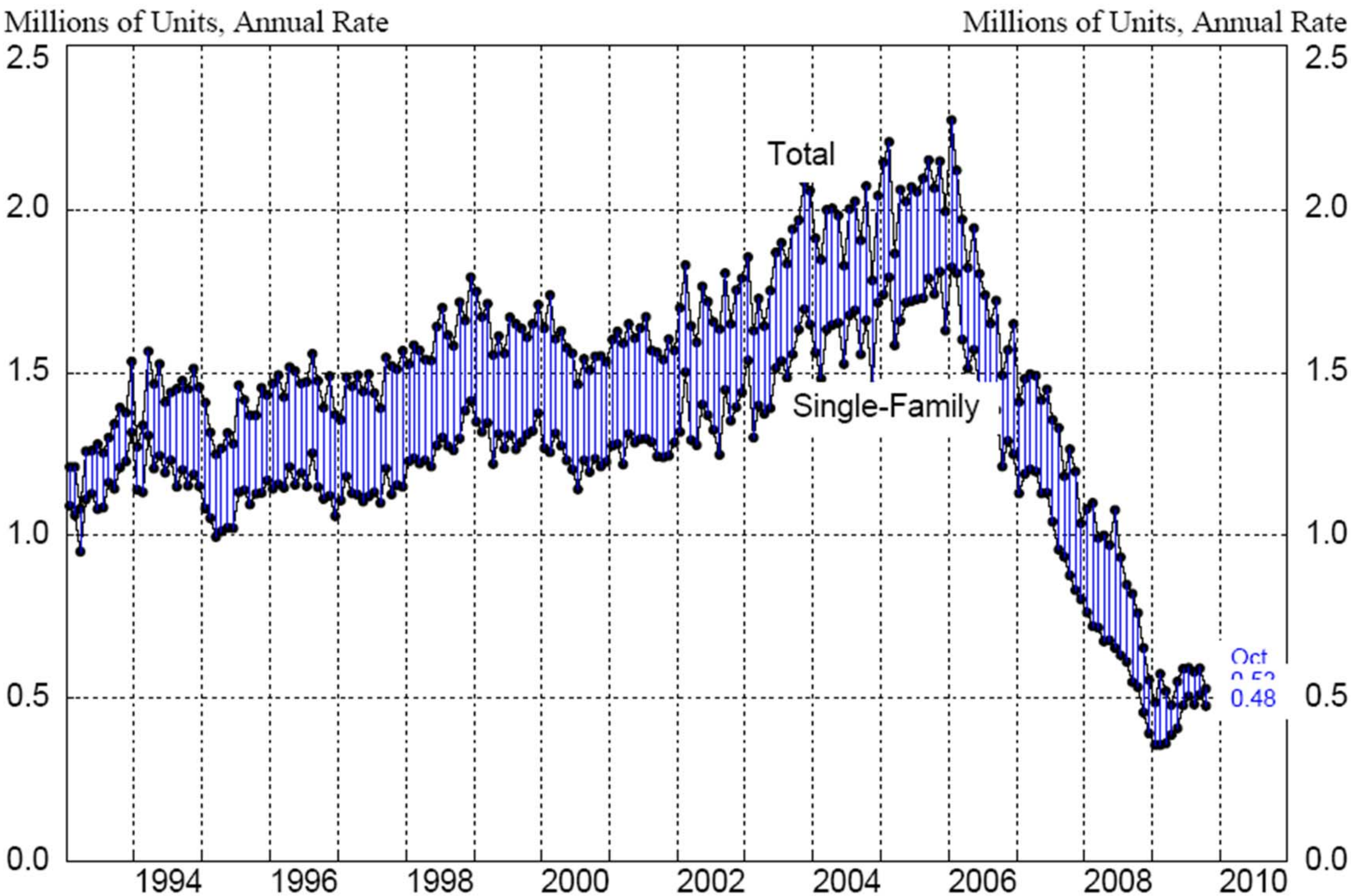


Rotman UNIVERSITY OF TORONTO



Rotman
UNIVERSITY OF TORONTO

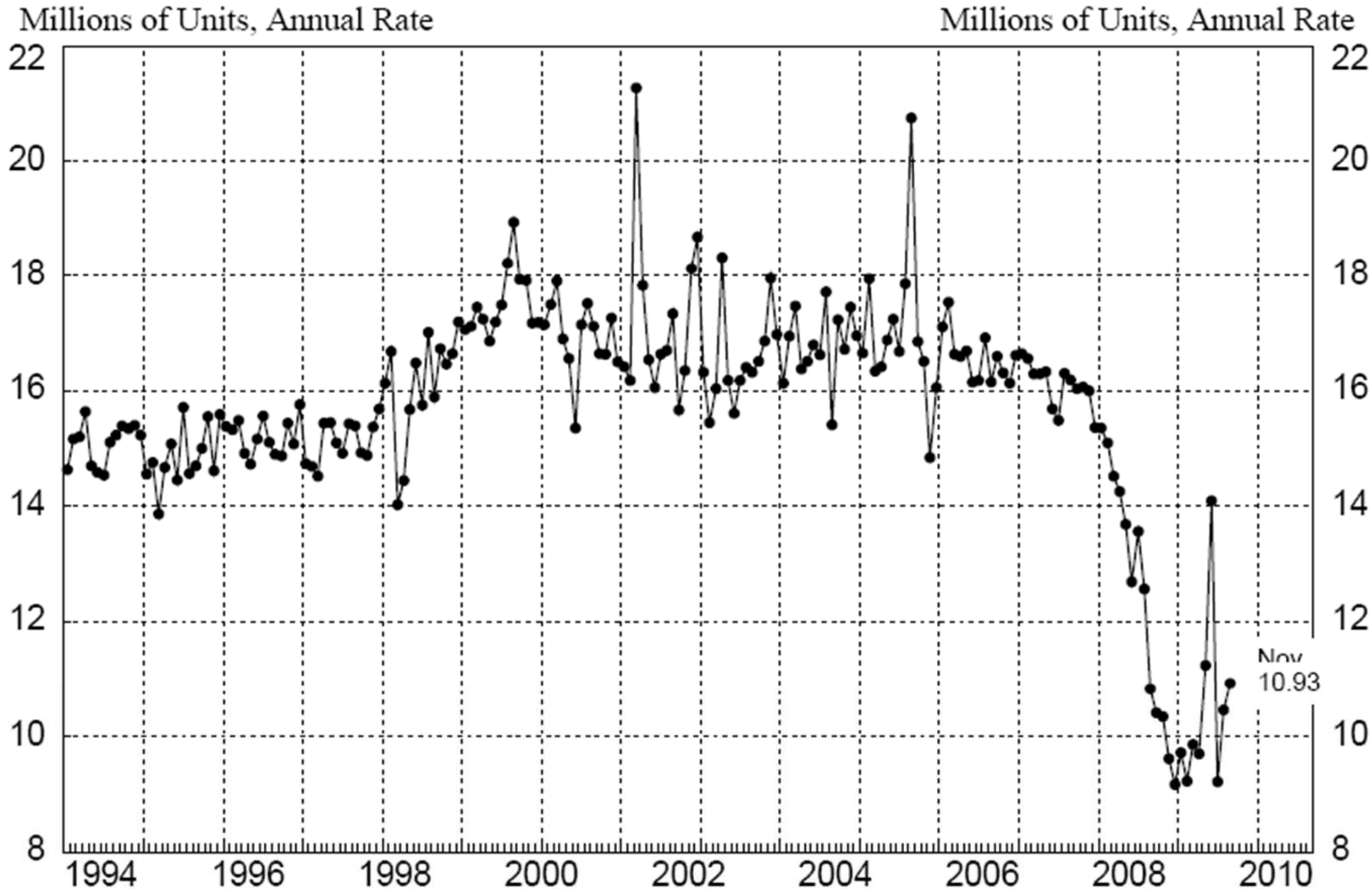
HOUSING STARTS



Source: U.S. Department of Commerce, Bureau of the Census

Rotman UNIVERSITY OF TORONTO

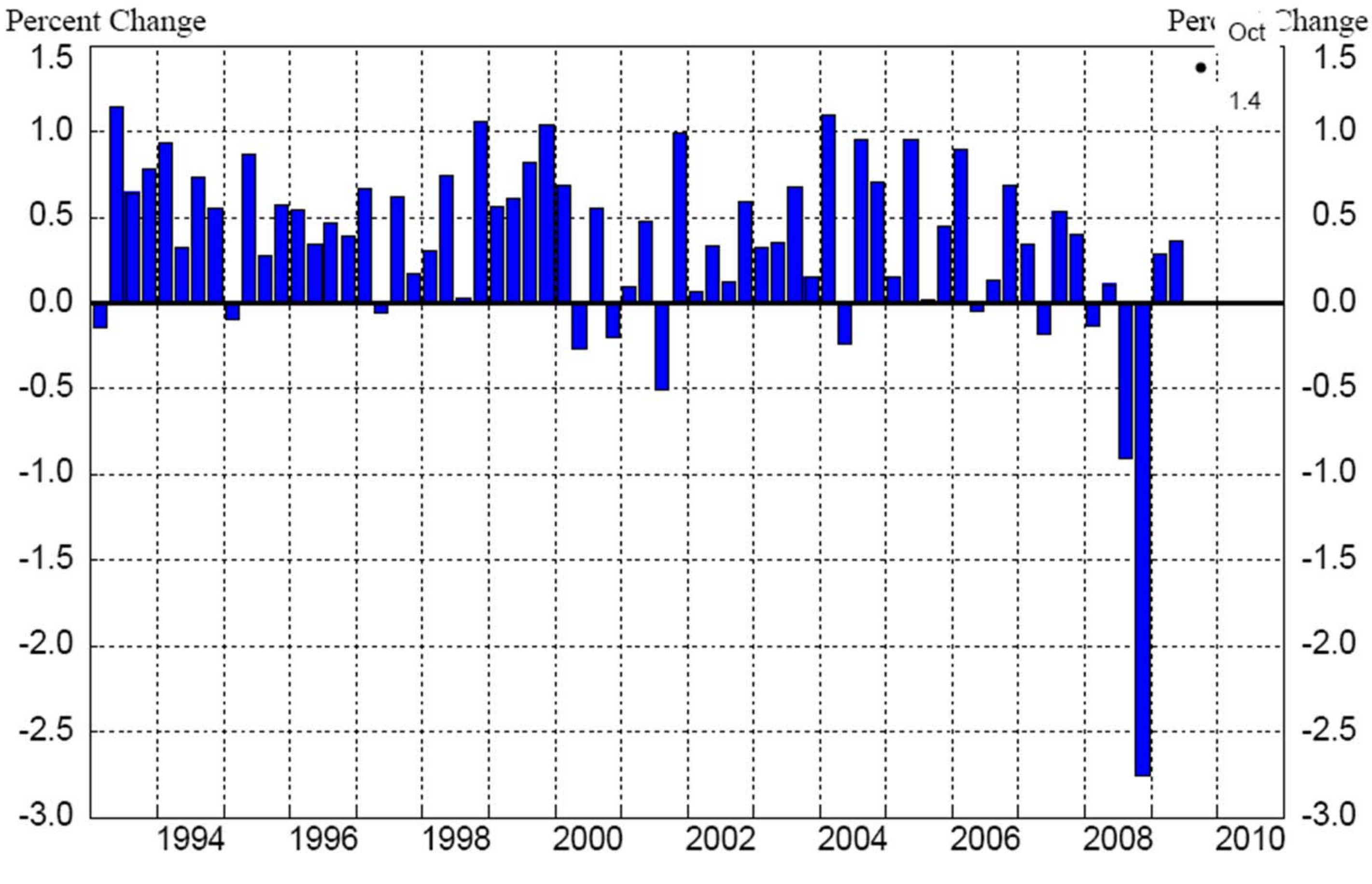
LIGHT-WEIGHT VEHICLE SALES



Source: Ward's Automotive Reports and the American Automobile Manufacturers Association.
Seasonal Adjustment Factors: U.S. Department of Commerce, Bureau of Economic Analysis.

Rotman
UNIVERSITY OF TORONTO

RETAIL SALES



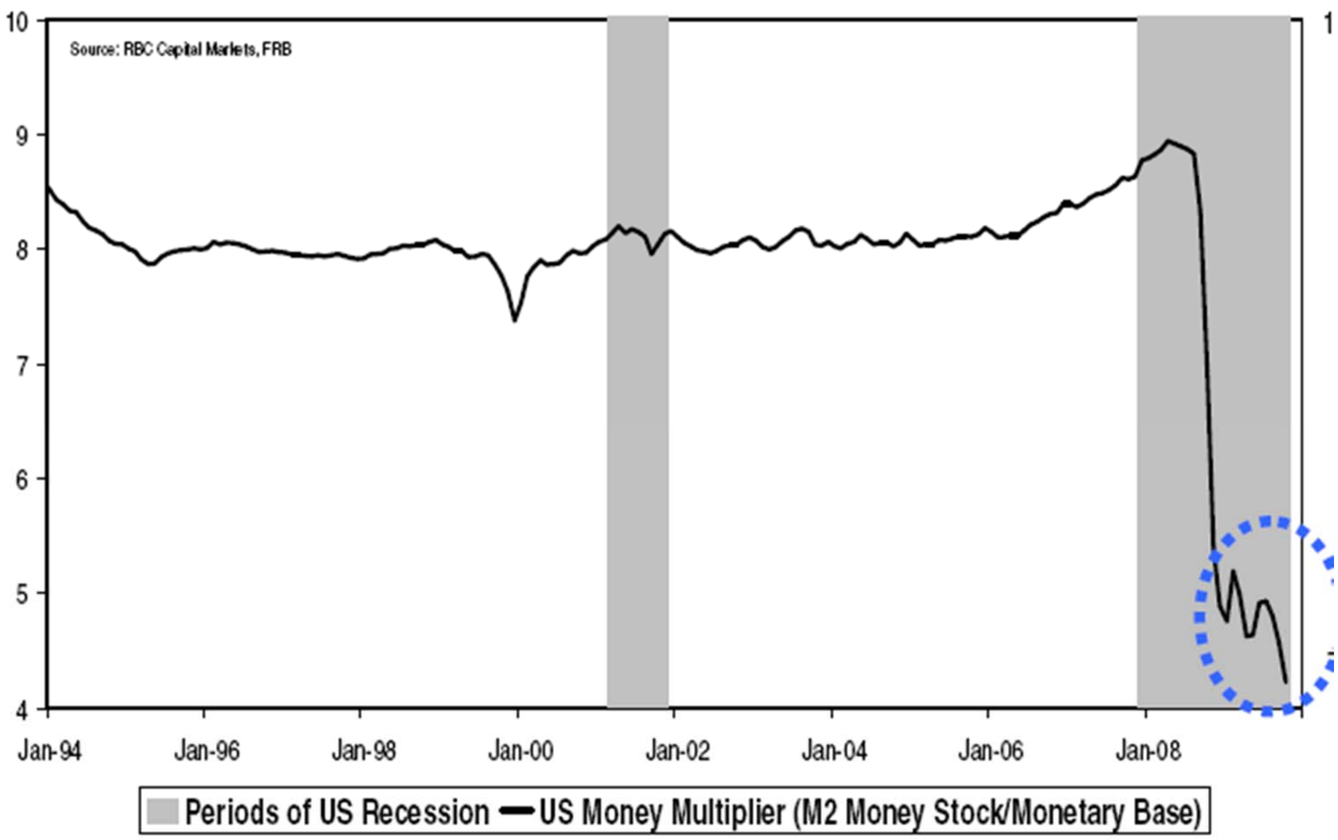
* Percent change based on quarterly average levels.
Source: U.S. Department of Commerce,Bureau of the Census

Macroeconomic Prognosis

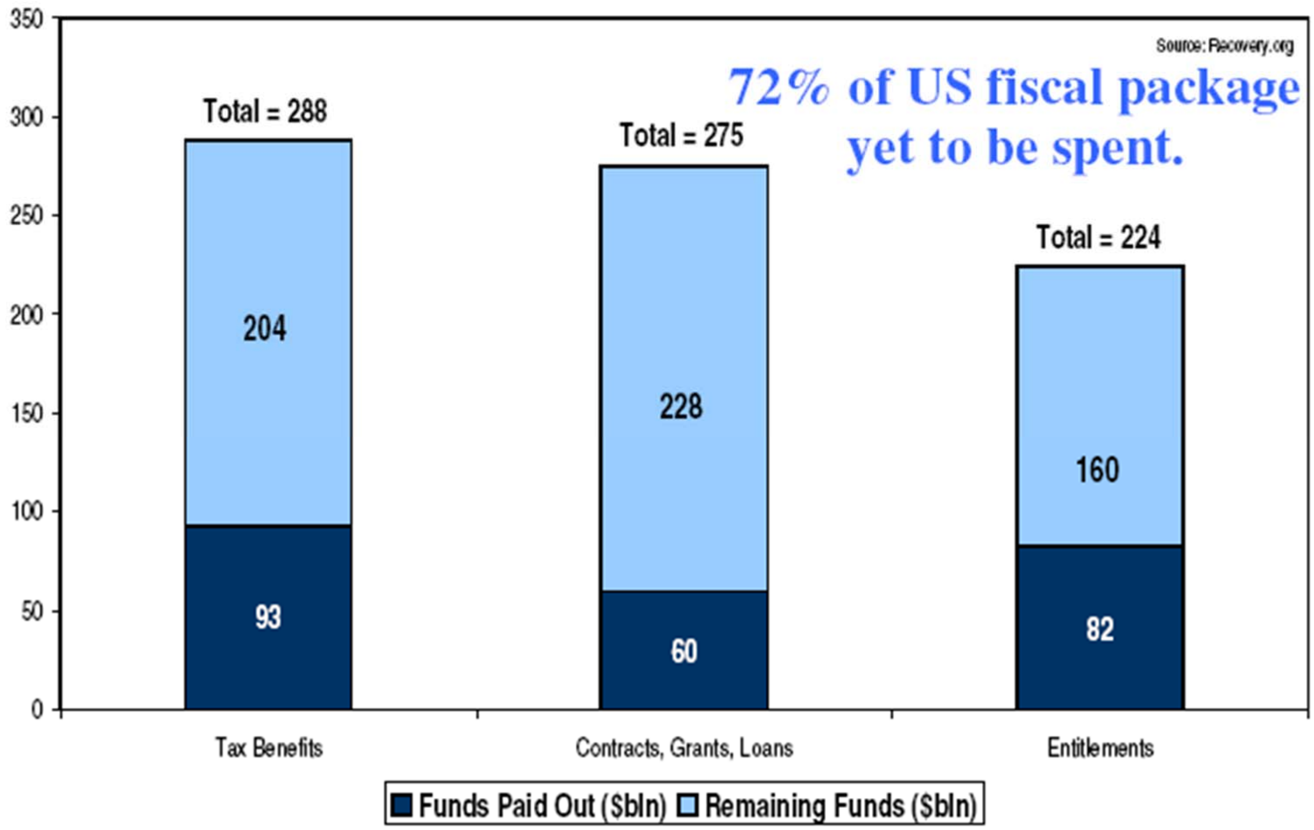
- US and European banks trying to rebuild capital:
  - Tightening credit standards
  - Massive capital builds (equity issues)
- Consumers wary for fear of job losses
- Keynes' "paradox of thrift" what is optimal for the individual may not be optimal for the economy
  - Hotly debated as Keynes is a red flag to right wing ideologues who are opposed to government intervention
- Keynes "animal spirits"
  - Confidence is critical
- Short run vs long run implications

Rotman UNIVERSITY OF TORONTO

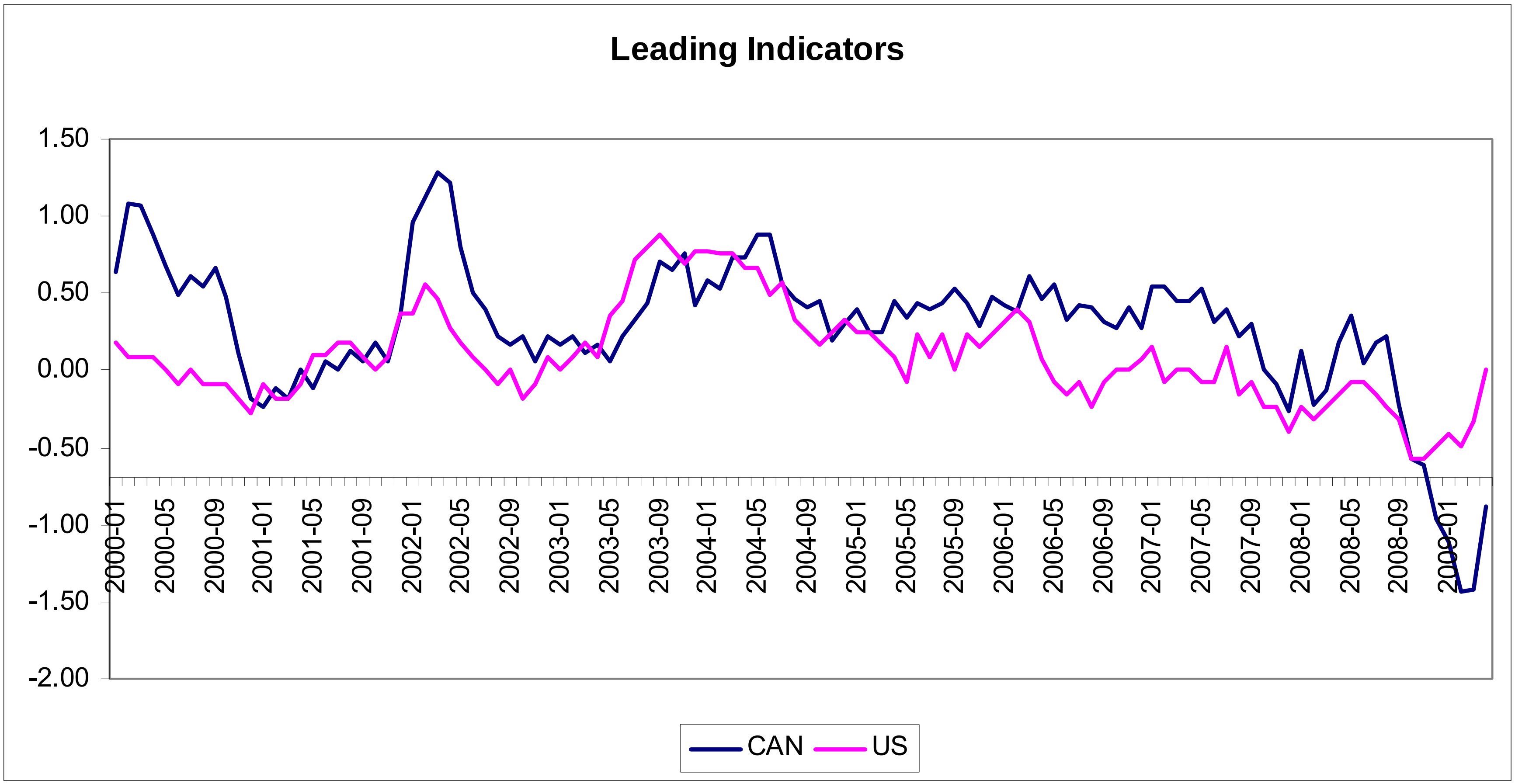
Monetary Policy



US Fiscal Policy



Leading Indicators



CEO Survey (Nov 11,2008 Reuters)

- *75%* agreed that more regulation of credit rating agencies was necessary
- *75%* supported greater regulation of hedge funds.
- *67%* said more complex instruments -- such as securitizations and structured credit -- required better regulation, more restrictions and more disclosure.
- *77%* said derivative products that provided exposure to shares should be made more transparent.
- *67%* did not support bans on short selling
- Calls for government agencies to be funded with better pay and more high quality staff.

Rotman
UNIVERSITY OF TORONTO

Bank Reform?

- UK “bonus” tax of 50%
- US
  - Tax to repay TARP funding (even though losses are AIG and car companies
  - Separation of proprietary trading from deposit taking and lending (even though this did not cause the problem) Glass Steagall
- Basel increase in capital (Dec 2009 draft document for comment)

Rotman
UNIVERSITY OF TORONTO

"Unregulated financial markets do not work. Canada has known that for a long time. I thought frankly, we all knew that from events of many decades ago – but obviously the United States went on a different path."

Prime Minister Stephen Harper

"I believe that banking institutions are more dangerous to our liberties than standing armies"

Thomas Jefferson

Rotman
UNIVERSITY OF TORONTO