

History of the World Largest Credit Risk Losses in 1972–2018

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We study the world largest credit risk losses from the year of 1972. We expect that such events drove the credit risk regulation development by the Basel Committee on Banking Supervision, including that of the Internal Ratings-Based (IRB) one of the Basel II Accord. By choosing a round threshold of current USD 100m equivalent of loss amount and the entity total assets in excess of current USD 500m as of the loss announcement date, we collected the dataset of 56 cases with the total credit loss of the current USD 700bn (or ca. 900 constant 2018 USD bn) which occurred during the last half of a century. We provide granular description of the stylized facts that characterize five typical credit risk evolution scenarios. The two most unexpected findings are as follows. First, we verified the announced loss amounts by analysis of stock quotes dynamics around the loss announcement dates. Thus we were able to trace three cases where announced by mass media

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losses may seem to have been exaggerated. Second, there is a series of events when there was a disclosure combination of credit risk loss and operational one. It is likely that the latter might have been used to partially cover the former.

Key words: Bankruptcy; bank default; Basel Committee; failure; loss-to-assets; risk; case-study.

JEL Classification: G10, G20, G21.

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1. Introduction

Financial institutions started to incur credit risk losses and to fail since their creation. Initially they experienced problems from over issuance of banknotes. Banknotes issued were not collateralized by the coins brought to banks [Hildreth, 1837]. For instance, that was one of default causes for Ayr Bank in Ireland in 1772 [Kosmetatos, 2014]. Later when the banknote turnover was limited to the amount of coins deposited within a bank, bank failures resulted from crashes in projects they financed, i.e., from credit risk. However, when there appeared stock exchanges and banks started investing their money in securities, those created new tools for banks to take on extra credit risk via long-term purchase of bonds (in the banking book, not the trading one as latter would result in market risk in regulatory treatment). Investigation of loss cases and their causes is vital for the development of the proper credit risk-management practices.

We started searching for the list of the world largest credit risk-related losses. We found several lists of losses: a public list of trading losses²; rankings (leagues tables) of the largest either losses or lost market capitalisation (e.g., The Economist, Fortune and CNN)³. However, these lists were either incorrect, or inconsistent, or both at a time. Here are some examples. First, a public list of trading losses includes case of the United California Bank of Basel that is said to have lost USD 40m in 1970 on cocoa futures, though it is below the announced by the source scale criteria of USD 100m. Second, the list includes Franklin National Bank loss of USD 40m in 1974 (also less than a threshold) on foreign exchange trading whereas it does not mention the bank loss of USD 1,3bn [Sinkey, 1979]. Third, the list does not differentiate causes for losses. For example, there were announced frauds when bookkeeping was manipulated for Societe Generale in 2007; whereas it was mere excessive, but still authorized risk-taking for Hypo Alpe-Adria in 2004 (to add in 2015 the bank experienced another material loss that was not reflected in the public list). Therefore there is no guarantee that the public lists are correct and exhaustive.

² A public list of trading losses included 50 cases as of 27 May 2018. It also used the threshold of USD 100m. URL: https://en.m.wikipedia.org/wiki/List_of_trading_losses [accessed Jan. 09, 2019].

³ URL: <http://www.economist.com/node/13919511>

URL: http://archive.fortune.com/galleries/2010/fortune/1002/gallery.biggest_losers.fortune/index.html

URL: <http://money.cnn.com/gallery/news/2015/10/14/biggest-corporate-scandals/index.html>

That is why we undertook own research to make that list complete, correct and to dig deep into the roots of credit risk, not limited to trading ones. In doing so, we tried to follow the data paper format of [Valencia, Laeven, 2012] who describe banking crises.

Most of the credit losses resulted in bank defaults (failures). There are papers dealing with the bank default probability modelling (e.g. [Peresetsky et al., 2004; Fungacova, Weill, 2013; Lozinskaia et al., 2017]), but they apply statistical tools disregarding the uniqueness of particular cases. That is why we wished to focus on the case-study analysis of the loss events.

To provide details of the above-mentioned findings the paper has the following structure. Section 2 presents literature review and approach to data collection. It summarizes academic papers that dealt with loss and default cases' analysis. It discusses how we searched for the cases of losses and failures and what the selection criteria were. Section 3 incorporates stylized quantitative facts about the collected cases, and Section 4 presents stylized qualitative facts. Section 5 collects the case-wise concise description of loss events. Section 6 concludes by summarizing findings. Annex 1 has quantitative information per each case.

2. Approach to Search

The credit risk loss event search was three-fold. First, we looked at the academic papers and used electronic resources to ensure the completeness of our research. Second, we proceeded to published (offline) sources. [Sinkey, 1979; BCBS, 2004] were the departing points for us. [Sinkey, 1979] focuses on earlier cases that took place in the United States, e.g., Franklin National Bank of New York. [BCBS, 2004] describes default cases in large developed economies, namely, the United Kingdom, the United States, Spain, Switzerland, Germany, Norway, Sweden, and Japan. [Steignum, 2003; Sandal, 2004] cover defaults in Norway and Sweden. Germany and Japan cases are discussed in [Mourlon-Druol, 2015; Harada et al., 2010], respectively. Third, we browsed academic databases of EBSCO, JSTOR and search engines of Google, Yandex, Bing for the following key words: bank default, bank failure, banks losses, banks defaults, banks crisis.

We have chosen a round figure of current USD 100 m as a threshold to select credit risk loss cases. The loss value amount was computed at the nominal exchange rate as of the loss announcement date. When measuring the loss amount, fines were added (for instance, with respect to subprime mortgage crisis in the United States). As the number of cases significantly exceeded 50 cases, we added another criterion to limit our dataset. The bank total assets should be no less than current USD 500 m as of closest reporting date. We additionally added USD inflation (consumer price index, CPI) for the United States to compare loss amounts in constant 2018 USD (source: World Bank). For instance, one dollar in 1974 equals ca. five dollars in 2018.

From time perspective we started our dataset from 1972 when the predecessor of the Basel Committee on Banking Supervision (a Brussels-based *Groupe de Contact*) was formed [Goodhart, 2011]. We stopped in 2018, the last year where audited financials were available.

When assigning geographical attribute to the country, we focused on the headquarters location, not that of the loss origin location.

Alternatively, one could have browsed the lists of the failed institutions within local regulator websites, including that of the deposit insurance agencies (e.g. FDIC). For instance, there were six bank failures in the U.S. since 2012 to 2019 with FDIC loss estimate above USD 100m and entity assets above USD 400m (e.g. Doral bank is the largest case)⁴. Our database has no

⁴ URL: <https://www.fdic.gov/bank/individual/failed>

entries for the U.S. for respective period. We preferred to focus on the most resonance cases, i.e. the most discussed and covered by mass media as they are the most material for banks in terms of size and are already public to be referred to. Due to our approach we were able to bring the novelty including tracing contagion loss cases, repetitive ones, manipulation ones (when operational risk coincided with the credit one). We understand limitations of the current database that it is de facto a set of extreme events that might be deemed a censored (lower truncated) set if one wished to build a probability of default model. However, we expect the reader to obtain valuable knowledge from the collected and described data on the most material losses. Thus, we focus on case-study analysis. Collecting data from the deposit insurance agencies and alike official government bo-dies' sources is a separate stream of work that falls out of current paper scope.

3. Quantitative Stylized Facts

As a result, we have collected 56 cases since 1972 to 2018. Hence, we were able to formulate three categories of stylized facts. First, we discuss loss descriptives. Second, we describe banks by total assets and by age. Age is the number of years between the default date and entity creation one. Third, we consider the geography of losses.

3.1. Loss Descriptives

Figure 1 and Table 1 present the descriptive statistics of the losses within the collected set. The average loss is current USD 12,5 bn (constant USD 16,1 bn), or ca. 11 per cent of the total assets with the most typical value of ca. 5% of the total assets.

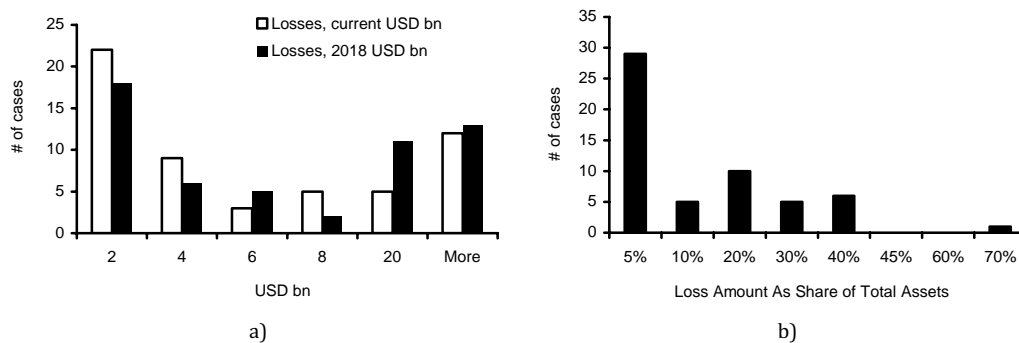


Fig. 1. Loss Value Distributions in absolute (a) and relative (b) terms

To verify correctness of the mentioned by mass media loss figures we investigated stock performance in the nearby time of the loss announcement date (where available for a publicly listed bank). This enabled us to doubt in certain figures as there were strange patterns observed. Namely, disregarding the fact of material loss announcement there was a case that share prices rose (for State Bank of India in 2017) or have fallen, but to a lesser extent than that of the competitors (e.g. Credit Suisse and Deutsche Bank, both in 2008). However, having no access to original data sources, we used the announced loss figures for our analysis.

Table 1.

Descriptive Statistics for Loss Amounts

	America	Asia	EU (w/o UK)	UK	Total
Loss, cur \$ bn					
MIN	0,1	0,8	0,2	29,2	0,1
AVG	9,7	17,2	8,2	71,6	12,5
MAX	67,0	53,0	37,0	114,1	114,1
SUM	260,9	137,6	156,2	143,2	697,9
Loss, 2018 \$ bn					
MIN	0,5	0,8	0,2	34,0	0,2
AVG	12,1	26,2	10,4	83,5	16,1
MAX	78,1	82,9	43,2	133,0	133,0
SUM	326,9	209,8	196,8	167,0	900,4
Loss-to-asset ratio, %					
MIN	0,1	0,5	0,2	3,2	0,1
AVG	13,4	10,9	9,0	5,3	11,3
MAX	38,8	30,1	61,1	7,5	61,1

3.2. By Total Assets and Age

Figure 2 and Table 2 present the facts about the banks within the selected set. Younger institutions dominate the set. From the total assets perspective in constant USD, there is a bi-modality in distribution of banks that suffered material credit losses. There are two typical bank sizes: small (around constant USD 50 bn in total assets) and large (ca. USD 500 bn) ones.

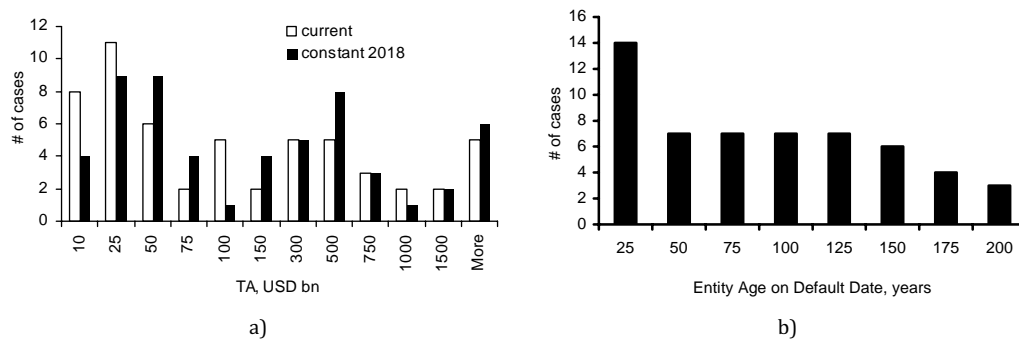


Fig. 2. Bank Distribution by Total Assets and Age

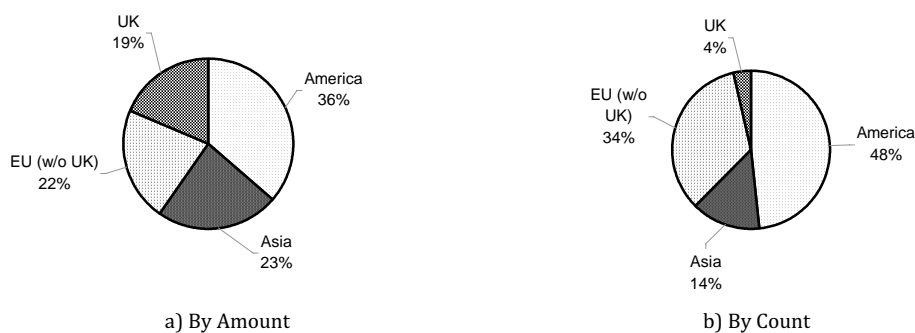
The youngest bank to experience a large loss of USD 186m three years after its creation is Gota Bank from Sweden in 1993. The eldest one is the Royal Bank of Scotland from the United Kingdom that lost USD 114 bn in 2008, i.e., 281 year after its establishment. It is also the largest entity in the sample with USD 3,6 trln in total assets as of the loss date. Its loss is same time the largest in the whole dataset in absolute terms (current USD 114 bn). The smallest entity in the set is Hamilton National Bank of Chattanooga from the United States that lost USD 200m in 1976 with total assets of current USD 500m. Merrill Lynch (1987; 2008) entered our list twice.

Table 2.**Descriptive Statistics for Loss Amounts**

	America	Asia	EU (w/o UK)	UK	Total
TA, cur \$ bn					
MIN	0,5	66,0	0,8	389,8	0,5
AVG	241,5	240,7	515,8	1988,5	396,8
MAX	1938,0	575,1	3105,9	3587,2	3587,2
SUM	6519,3	1925,6	9799,4	3977,1	22221,3
TA, 2018 \$ bn					
MIN	2,0	95,8	1,4	454,7	1,4
AVG	297,1	296,0	618,4	2319,2	478,2
SUM	2260,3	664,4	3622,4	4183,8	4183,8
MAX	8021,6	2368,3	11750,2	4638,4	26778,6

3.3. By Geography

Figure 3 presents additional information on cases' breakdown by geography. Two distinct countries that dominate the geographical distribution are the United States and Europe. Those are countries with the largest banking systems and thus having by construction higher a priori probability of scoring the world-largest credit risk losses.

**Fig. 3.** Total Losses Breakdown by Geography

Asian losses mostly relate to 1990s mortgage and 1997 Thailand crises, whereas American cases correspond mostly to the Savings and Loans (S&L) crisis of 1980s and the 'Great Recession' of 2007–2009.

Interestingly we found no large losses related to Chinese state banks, though several of those sit within world TOP-10 banks by the total banking assets. Restructuring might have taken place to hide actual loss as Chinese financial credit institutions by probability theory should have at least experienced a loss in excess of USD 100m. As a cross-check we found a mention of an aggregate amount of bad debts for Chinese banks equal to roughly USD 200 bn, though no details by entity are available in [Mishkin, 2006, p. 304]; or to ca. 35% of total lending portfolio according to [Lardy, 1998] cited by [Selmier II, 2017, p. 176].

4. Qualitative Stylized Facts

As there are two distinct waves of the credit risk losses (20 cases after Basel I introduction since 1988 to 1998; 27 cases after Basel II inaction from 2007 to 2010), let us briefly compare the nature of subprime mortgage crises in 1987 and 2007. Both times plunge in real estate prices triggered losses. Same time in 2007 the real estate price was artificially higher than compared to 1987. The volume of transactions was also much higher in 2007 compared to 1987. In addition to that, there appeared collateralized debt obligations (CDOs) in 2007. Though CDOs contained mortgage bonds of BB and BBB credit rating, CDOs themselves were rated at AAA. Thus, overall credit grade was artificially heightened, though comporting no grades higher than BBB (the financial engineering technique for such underwriting product may be found in the first Chapter of [Mason et al., 1995]). Thus banks were deemed more creditworthy than they really were. Given the same amount of initially offered mortgage loans, CDOs enabled to enlarge credit exposure. This led to extra profits in good times and extra risks and losses in bad ones.

All found cases can be grouped into five general classes. Class 1 refers to typical scenario of credit loss realisation. Initially there is a trigger: e.g. two times lower risk-weight offered for mortgage lending, than for other corporate and retail claims in Basel I of 1988; or decrease in key rate mostly to zero in the United States in 2000s. Due to a kick-off trigger banks start offering mortgage loans and loans to building and construction societies at preferential terms and conditions. Those mortgage loans are actively taken implying increased demand for property and consecutive hike in prices. Continued rise in prices make real estate an attractive collateral even in cases when the borrower has no sufficient cash incomes of his own. The situation exacerbates till an end-point trigger comes in. Such a trigger might be a local or an international economic crisis, or a spike in key rate leading to material repricing of mortgage interest payments. Such a trigger implies decrease in demand for mortgage loans. As a result housing prices stop rising. Borrowers cannot pay for more expensive housing place. Banks start to liquidate collateral. Thus property prices go down deeper. Contagion implies further decrease in demand for loans as people wait till prices get down even more. Building and construction companies cannot sell the built real estate and get bust. Banks fail. People become unemployed. Country-wide crisis takes place. Such scenario was typical for American Savings and Loan in 1984, First Republic Bank in 1988, Mcorp in 1989, Gibraltar Savings in 1989, City Federal Savings in 1989, Christiania Bank og Kreditasse in 1991, Fokus Bank ASA in 1991, Hokkaido Takushoku Bank in 1997, Dresdner Bank in 2008, United Commercial Bank in 2009, HQ Bank in 2010, Bank of India in 2016, State Bank of India in 2017.

Class 2 comports cases when banks had overfocused on mortgage loans. They did not sufficiently diversify their books and thus the shock became more pronounced to them. This is the situation with Hamilton National Bank of Chattanooga in 1976, Den norske Bank in 1991, Spar + Leihkasse Thun in 1991, Southeastern Bank in 1991, Nordbanken in 1993, The Royal Bank of Scotland Group in 2008, Wells Fargo in 2008, Fortis in 2008, Washington Mutual in 2008, Downey Savings and Loan Association in 2008, Guaranty Bank in 2009.

Class 2 has two sub-classes. One includes the cases where concentration was raised by lending to both buyers and sellers, i.e. to retail house purchasers and to building and construction societies, respectively. These are the cases with Security National Bank of Long Island in 1975, Long Term Credit Bank of Japan in 1998. Another subclass of class 2 comports cases when credit risk was accumulated via the form of securities either by holding a proprietary position, or by participation in securities origination and underwriting (particularly, that of collateralized debt obligations, CDOs, and mortgage-backed securities, MBSs). Here the losses were experienced by Countrywide in 2007, Bear Stearns in 2007, Merrill Lynch in 2008, Citigroup in 2008, Wachovia in 2008, Norichukin Bank in 2008, Credit Suisse in 2008, Deutsche Bank in 2008, Morgan Stanley in 2008, Bank United in 2009.

Class 3 groups the cases when there was a particular external trigger that led to worsening of creditworthiness. Such a trigger could be either a rise in cost of funding (for instance, Franklin National Bank of New York in 1974, Sparbanken Sverige in 1992, Skandinaviska Enskilda Banken in 1992, Gota Bank in 1993, Handelsbanken in 1996, Halifax Bank of Scotland in 2008, IndyMac Bank in 2008) or a contagion effect, i.e. problems with the bank's counterparty that led to material losses of a bank itself (here are Nippon Credit Bank in 1998, Dresdner Bank in 2008, Hypo Real Estate in 2008, Union Banks of Switzerland in 2008, Bayerische Landesbank in 2008, Colonial Bank in 2009, AmTrust Bank in 2009).

Class 4 deserves separate discussion. We found several cases when operational risk (fraud) was announced mostly same time as the loss on credit risk, i.e. on the mortgage portfolio, was revealed. This was typical for Merrill Lynch in 1987; Yamaichi Securities Company in 1997; Societe Generale in 2007; Colonial Bank in 2009; Punjab National Bank in 2016. Coincidence of announcements implies the hypothesis that the most loss might have been attributed to the mortgage part or more generally to the credit risk. However, to park part of the loss as an extraordinary (one-off) event fraud activities might have been mentioned as an excuse for the top-management improper strategic planning. The importance is the revealed fact of such events' coincidence.

Class 5 includes the rest of the credit loss cases there had some unique features. For instance, Bank of New England in 1991 proposed to regulator to sell its companies registered at the Man and Rod Islands. However, the plan was rejected leading to the failure of the bank. Goldome in 1991 had its problem worsened after the application of new accounting rules. When goodwill was subtracted from the capital base, the bank stopped meeting regulatory requirements. In fact the bank was undercapitalized much before, but only an external trigger helped to reveal the problem. Fortis in 2008 had painful situation as crisis occurred when the bank was in the process of purchasing its competitor. Thus it lacked financial resources to cover credit losses. HQ Bank in 2010 had experienced not only severe credit losses, but also a bank run that led to ultimate failure and closure of a bank.

5. Case Descriptions

1) 1974, Franklin National Bank of New York (United States); credit loss of USD 1,3 bn

The Bank followed the conventional business model of short-term borrowing and long-term lending with one exception. One sixth of bank liabilities consisted of high-yield Fed-funds. That is why the bank strategy was to lend to risky corporate borrowers to be able to justify high interest rates. This was needed to gain profit above the high rate on its liabilities. The 1973–1974 oil crisis led to defaults of bank borrowers and to the failure of the whole bank.

2) 1975, Security National Bank of Long Island (United States); credit loss of USD 0,11 bn

The bank actively offered loans to building and construction firms. A crisis in the real-estate market led to defaults of the borrowers and the bank.

3) 1976, Hamilton National Bank of Chattanooga (United States); credit loss of USD 0,15 bn

From its establishment in 1889, the bank ran a conservative credit policy. However, in the 1970s, it decided to make a switch and lend to rapidly progressing construction firms. In contrast to the Security National Bank of Long Island, there was a subsidiary building entity that received loans. As a result of the real estate market crisis, the bank failed.

4) 1984, American Savings and Loan (United States); credit loss of USD 3,3 bn

In 1970–1980s the bank was actively offering mortgage loans. When housing prices fell as a result of the real estate crisis, borrowers stopped paying their mortgages. As a result, the bank failed.

5) 1987, Merrill Lynch (United States); credit loss of USD 0,28 bn

Real-estate prices had been growing for the last five consecutive years since 1982. Thus, in April 1987 the bank bought bonds of the State National Mortgage Association for USD 935m to profit from the expected continued growth in prices. However, there followed a plunge in real-estate prices. Bank management decided to sell securities being unaware of another purchase deal. It was trader Howard Rubin who made an unauthorized deal to buy same bonds for USD 500m. This case was mirrored thirty years later in 2007 by Societe Generale. In contrary to Merrill Lynch, Societe Generale first announced fraud by a trader, and only then disclosed losses on their mortgage portfolio.

6) 1988, First Republic Bank (United States); credit loss of USD 3,86 bn

The bank was active in mortgage lending. After the collapse in real-estate prices, borrowers, as well as the bank itself defaulted.

7) 1989, Mcorp (United States); credit loss of USD 2,7 bn

The bank specialized in mortgage lending and lending to electricity companies. It suffered losses twice. First, from the plunge in real-estate prices. Second, from the dive of oil and gas prices starting in 1985.

8) 1989, Gibraltar Savings (United States); credit loss of USD 0,25 bn

The bank had also failed from over-focusing on mortgages and the respective fall in real-estate prices.

9) 1989, City Federal Savings (United States); credit loss of USD 0,22 bn

From 1984–1989 the bank more than tripled its mortgage loan portfolio. This was possible due to the abandoning of credit lending limits. When the savings and loan crisis of 1980–

1990s occurred, the bank collapsed. Similar scenarios were observed in Japan 1996–1998 (see cases of Hokkaido Takushoku, 1997; Yamaichi Securities Company, 1997; Nippon Credit Bank, 1998; Long Term Credit bank of Japan, 1998).

10) 1991, Bank of New England (United States); credit loss of USD 6,3 bn

The bank had focused on building and construction companies, as well as on mortgage lending. The former provided ca. 50% of the loan book, the latter ca. 20%. As a result of the real-estate boom bust, home prices plunged. To avoid going bankrupt the bank offered two options. First, it applied for the regulatory approval of the plan to sell its companies on Man and Rod Islands. The proposal was rejected by the local Boston Federal Reserve. Second, the bank wanted to convert its debt instruments to equity. Almost twenty years later in Basel III this option became a prerequisite for an instrument to be treated as a capital component for CAR purposes. In 1991 debt-holders rejected the novelty.

11) 1991, Christiania Bank og Kreditkasse (Norway); credit loss of USD 0,73 bn

The bank specialized in retail mortgages. There was a home price boom. Bankers credited the population to buy flats and houses, and demand for housing rose. Therefore, housing prices rose. Building societies increased housing offers and banks lent mortgages more tolerantly as the collateral price was rising, decreasing credit risk estimates. That was a conventional housing bubble that expanded until the economic recession caused by oil prices falling ca. by 20% in 1991. Housing prices started to fall. The bank was left with non-serviceable loans.

12) 1991, Fokus Bank ASA (Norway); credit loss of USD 0,17 bn

The bank replicated the destiny of Christiania Bank og Kreditkasse. By specializing in mortgage lending it became vulnerable to the housing bubble burst.

13) 1991, Goldome (United States); credit loss of USD 1,5 bn

Goldome followed the path of City Federal Savings. It focused on mortgage lending and lending to building and construction firms. The housing bubble burst hit the bank's standing. There were two reasons. Borrowers' incomes decreased and they were unable to pay on time and housing prices dropped leading to undercollateralized lending. Losses were exacerbated by the change in regulatory treatment. Goodwill was derecognized as part of capital leading to a decrease of bank capital base by USD 530m.

14) 1991, Den norske Bank (Norway); credit loss of USD 0,54 bn

The bank topped the country ranking for the largest losses having shared the first place with Christiania bank og Kreditkasse and Fokus Bank ASA. Den norske Bank also focused on retail mortgages. It went bust when the housing bubble burst.

15) 1991, Spar + Leihkasse Thun (Switzerland); credit loss of USD 0,15 bn

Though from another country than Goldome or Den norske, it faced the same problems from having largely focused on mortgage lending. The housing bubble burst led to the deterioration in borrowers' creditworthiness and a diminishing of the collateral base. As a result, the bank suffered losses.

16) 1991, Southeastern Bank (United States); credit loss of USD 0,5 bn

The bank focused on mortgage lending. As in Norway and Switzerland, it was hit by the housing bubble burst. Disregarding the fact that the bank met all the regulatory requirements, the regulator decided to liquidate it because there were non-performing mortgage assets on its balance sheet.

17) 1992, Sparbanken Sverige (Sweden); credit loss of USD 6,53 bn

The Swedish bank focused on mortgage lending. As in Norway, Switzerland, the United States, the fall in housing market prices led to borrower defaults and ultimately to bank insol-

vency. In Sweden the bubble burst was triggered by economic slowdown (there was a decrease in GDP) and by the policy of the Central Bank that increased short-term interest rates.

18) 1992, Skandinaviska Enskilda Banken (Sweden); credit loss of USD 6,26 bn

The situation is similar to that observed with Sparbankern Sverige. The focus on the retail mortgage lending market was the cause for bank failure after the prices plunged.

19) 1993, Nordbanken (Sweden); credit loss of USD 4,06 bn

The Bank focused on retail mortgage lending and followed the list of bankrupt banks after the failures of Sparbanken Sverige and Skandinaviska Enskilda Banken.

20) 1993, Gota Bank (Sweden); credit loss of USD 5,52 bn

This case is similar to the other Swedish mortgage lending banks (Sparbanker Sverige, Skandinaviska Enskilda Banken and Nordbanken).

21) 1996, Handelsbanken (Sweden); credit loss of USD 3,32 bn

This is the latest case of bank failure after the housing bubble burst in Sweden. Having over focused on retail mortgage lending, the bank did not survive.

22) 1997, Hokkaido Takushoku Bank (Japan); credit loss of USD 7,5 bn

The bank focused on mortgage lending. After the Japanese housing bubble burst, it incurred material losses.

23) 1997, Yamaichi Securities Company (Japan); credit loss of USD 53 bn

The bank focused on retail mortgage lending. It was also investing in stocks. During boom times mortgage collateral and equity valuation grew. When the bubble burst losses came from delinquency in mortgage loans and the negative revaluation of equity positions. At the same time the bank announced that it had revealed the fraudulent activity of a group of traders that were using client accounts to hide their own losses. This case is somewhat similar to what took place 10 years later with Societe Generale in 2007, when the bank also disclosed fraud and losses from mortgage loans.

24) 1998, Nippon Credit Bank (Japan); credit loss of USD 27 bn

The bank was one of the most long-resisting against the housing bubble burst. However, the large share of mortgage lending and the respective borrower defaults led to bankruptcy. If there were no Asian crisis of 1997, the bank might have survived even with the cumulative loss on the mortgage portfolio.

25) 1998, Long Term Credit Bank of Japan (LTCB) (Japan); credit loss of USD 42,15 bn

The bank focused on lending to building and construction societies and on retail mortgages. Whereas it prospered during the housing boom, it suffered losses and went bankrupt during its bust.

26) 2007, Countrywide (United States); credit loss of USD 1,2 bn

The Countrywide financial corporation was focusing on retail mortgage lending. In addition, it had mortgage-backed securities (MBS) on its balance sheet. When the subprime mortgage crisis started in the United States, borrowers' creditworthiness worsened; collateral and MBS fell in value. As a reaction to the crisis, the corporation decided to materially limit its lending program. However, the material loss led to the corporation being sold to Bank of America in 2009.

27) 2007, Bear Stearns (United States); credit loss of USD 1,6 bn

The investment bank focused on the issuance and purchase of CDOs and MBS. When the housing bubble burst in the United States, all related financial instruments were priced close to zero. Though the bank met regulatory requirements, particularly that of Basel II, according to

[Kobrak, Troege, 2015], it failed. This case was a trigger to significantly tighter securitisation regulation in the United States.

28) 2008, Société Générale (France); credit loss of USD 19 bn

A bank trader Jerome Kervel was betting on the rise in European stock market indexes. He was buying futures. To pass the bank's limit system he inputted false reverse transactions to demonstrate a close to zero net position. Because world markets plummeted as a result of the subprime mortgage crisis, the bank experienced losses of ca. EUR 5bn (USD 7bn). It was said that the fraud was revealed by means of an ordinary inspection. However, two weeks later the bank had disclosed losses on its mortgage portfolio equal to another EUR 8bn (USD 11bn). Thus, the overall loss for December 2007 was ca. USD 19bn. The case mimics that of Yamaichi Securities that lost USD 53bn in 1997. At that time, it was also announced that two risk factors were in place: mortgage portfolio loss and trader fraud.

29) 2008, Merrill Lynch (United States); credit loss of USD 24 bn

The bank experienced losses because of the expanding subprime mortgage crisis. It was actively lending retail mortgages and securitized those by selling mortgage-backed securities (MBS). When floating interest rates were repriced in 2007, mortgage borrowers started defaulting on their loans. This led to a plunge of MBS prices and eventually to bank material losses. As a result of 2008 losses the bank was merged with Bank of America in 2009 to form Bank of America's Merrill Lynch. Due to Bank of America own losses as well as to the sanation of Merrill Lynch and Countrywide the US Treasury offered TARP bailout funds of USD 45bn that were duly repaid by the bank by 2016. However, in 2016 the US Department of Justice issued 34 fines in total for USD 77,1bn for Bank of America for manipulation of mortgage securities in 2007–2009.

30) 2008, The Royal Bank of Scotland Group (RBS) (United Kingdom); credit loss of USD 114,06 bn

The bank experienced losses from the expansion of the subprime mortgage crisis. When the housing bubble burst, borrowers stopped paying and collateral fell in value. To rescue the bank the government made an injection of GBP 21bn (ca. USD 40bn). To the surprise of regulators, bank management used GBP 1bn (ca. USD 2bn) for reward payments on the grounds that it was a promised payment disregarding the incurred losses.

31) 2008, Citigroup (United States); credit loss of USD 37,12 bn

The bank suffered from indebtedness on the retail mortgages it was directly offering and from purchasing mortgage bonds on its balance sheet. The overall credit loss equaled USD 18,7bn. The US Treasury bailed out the bank for USD 45bn. The bank duly repaid the amount by 2016. However, in 2016 the US Department of Justice imposed 18 fines for a total of USD 18,4bn for manipulation in mortgage security issuance. Prior to the US subprime mortgage crisis, the bank was considered to be the world largest by market capitalization. It exceeded USD 1trln with a share price around USD 550. However, large losses resulted in an eight-times drop of its capitalization to USD 175bn and to share price of USD 70.

32) 2008, Wachovia (United States); credit loss of USD 23,9 bn

One of the top American investment banks had over focused on mortgage exposure. It was not only granting retail mortgage loans but sold insurance protection against mortgage lenders default. In fact, it was leveraging credit risk that hit the bank when the housing market bubble burst.

33) 2008, Wells Fargo (United States); credit loss of USD 47,4 bn

The bank lost because of the subprime mortgage crisis. When borrowers defaulted on their debts to the bank, it had to wind up approximately a third of its capital (USD 37,2bn). To support the bank the US Treasury granted a bailout of USD 25 bn that was duly repaid by the bank. However, in 2016 it received 10 fines for USD 10,2bn from the US Department of Justice for manipulation of mortgage securities.

34) 2008, Fortis (Belgium); credit loss of USD 37 bn

Generally, the bank suffered from mortgage defaults. The situation was aggravated by the purchase of a competing bank ABN AMRO. It issued shares to finance the acquisition. It reissued stock to fund crisis losses. However, the loss write-down was so significant that CAR significantly decreased and there were rumors about bank solvency resulting in a share price drop and subsequent bankruptcy.

35) 2008, Norinchukin Bank (Japan); credit loss of USD 2,69 bn

The losses of the Japanese bank were related to the mortgage crisis in the USA in 2007–2009. The active purchase of mortgage-backed securities (MBS) was first associated with minimal risk. However, after the floating rates repriced, borrowers defaulted. This led to bank losses.

36) 2008, Halifax Bank of Scotland (HBOS) (United Kingdom); credit loss of USD 29,15 bn

The bank experienced losses from both a deterioration in the credit quality of its mortgage portfolio and an increase in funding costs. For instance, one-day USD LIBOR rose from 5,5 to 6,8% in September 2008. As a result, the bank tried to communicate with clients to persuade them of the bank's solvency. The case is similar to Banco Ambrosiano default in 1982 when the Vatican was assuring clients of bank's standing. In both cases it did not work.

37) 2008, Dresdner Bank (Germany); credit loss of USD 1,88 bn

The bank's losses were a consequence of the mortgage crisis in the USA in 2007–2009. Losses were brought by an increase in the amount of nonperforming loans. It is similar loss scenario to Hypo Real Estate in 2008.

38) 2008, Credit Suisse (Switzerland); credit loss of USD 10,82 bn

The bank had purchased mortgage-backed securities (MBS) for ca. CHF 11bn (USD 10bn), or 1,5% of its total assets. When the subprime mortgage crisis started, the price of MBS fell mostly to zero. This led to a credit loss of USD 7,1 bn. In 2016 it was required by the US Department of Justice to pay 4 fines for USD 3,7 bn for the manipulation of mortgage securities.

We doubt that the loss was indeed as significant as it was reported in the mass media. The bank quotes fell by 37% during 2008. However, the competitor's quotes fell even larger, e.g. its competitor UBS quotes declined by 75%.

39) 2008, Deutsche Bank (Germany); credit loss of USD 7,3 bn

Deutsche Bank was underwriting CDOs and MBS. It was also selling CDS protection against mortgage bond defaults. Thus, it accumulated significant concentrated credit exposure to housing market-related risks. When the housing market collapsed, it led to bank losses of USD 1,8bn. In 2016 the bank received 4 fines from the US Department of Justice of USD 14bn because of speculation and improper issuance of synthetic mortgage bonds. Though bank management was able to reduce the bill to USD 7,2bn, its market capitalization fell mostly 10 times since its peak in 2007. It was ca. USD 240bn with share price of USD 145. Ten years later its quotes continue falling to historical lows with market capitalization of USD 25bn and a share

price of USD 12 (even in the worst crisis period of 2009 its share price did not fell lower than USD 25 per share).

We doubt that the loss was indeed as severe as reported in the mass media. Though the bank quotes fell by more than 56% on the loss announcement day, the competitor's quotes fell even further (e.g. Commerzbank stocks retreated by 82%).

40) 2008, Hypo Real Estate (Germany); credit loss of USD 3,9 bn

The losses of the bank were related to the crisis that occurred in the USA in 2007–2009. The contagion proliferated from America to Europe. Having over concentrated mortgage credit risk exposure, the bank suffered significantly from the housing market bubble burst. Hypo Real Estate experience one of the largest losses in Europe during the subprime mortgage crisis together with Dresdner and Bayerische Landesbank in 2008.

41) 2008, Washington Mutual (WaMu) (United States); credit loss of USD 67 bn

The bank was actively granting mortgage loans in California from 2005 when housing prices started to sky-rocket. When the housing bubble burst, it suffered loss on the asset side of the balance sheet. It also experienced significant cash outflow when funds were withdrawn upon the default of Lehman Brothers, the banks' largest depositor. This is a typical case of contagion proliferation.

42) 2008, Morgan Stanley (United States); credit loss of USD 13,92 bn

The bank was issuing and buying mortgage-backed securities for a proprietary position. When the US housing bubble burst, it suffered loss of USD 9,1bn. To recover the US Treasury offered TARP bail-out funding of USD 10bn. The bank repaid it by 2016. Then the US Department of Justice issued 7 fines for USD 4,8bn for bank's manipulation of underwriting mortgage securities.

43) 2008, IndyMac Bank (United States); credit loss of USD 10,7 bn

The bank focused on mortgage lending. The large loss was brought about by 2007 subprime mortgage crisis when there was an upward repricing of interest rates on mortgage loans.

44) 2008, Union Bank of Switzerland (UBS) (Switzerland); credit loss of USD 32,77 bn

UBS actively transacted with US banks. When the subprime mortgage crisis hit their American counterparts, the bank experienced the contagion effect. Most of its mortgage securities had to be written down bringing a loss of CHF 21bn (USD 18bn). After the crisis in 2016 the US Department of Justice sued the bank for improper transactions with mortgage securities. It issued 8 fines for USD 6,5bn.

45) 2008, Downey Savings and Loan Association (United States); credit loss of USD 0,55 bn

The bank focused on mortgage lending. To actively expand it changed business strategy from using intermediaries when offering loans to direct lending. When the housing bubble burst, the bank experienced losses.

46) 2008, Bayerische Landesbank (Germany); credit loss of USD 3,78 bn

As with the losses of Hypo Real Estate, losses were related to the mortgage crisis in the USA in 2007–2009. Bayerische Landesbank invested in mortgage-backed securities (MBS) in the US market. After real estate market prices fell, there was a decrease in MBS quotes. This led to bank losses.

We doubt that the loss was indeed as significant as reported in the Mass Media. Though the bank quotes fell by 50%, the competitor's quotes fell even further. The Commerzbank quotes declined by almost 83%.

47) 2009, Bank United (United States); credit loss of USD 4,9 bn

As an insurer, the company was searching for investment opportunities. Since 2005 mortgage securities had seemed to be an attractive asset. To hedge against credit risk, it was buying CDS together with mortgage securities to benefit from risk-free arbitrage profit. However, it was at the same time selling CDS protection to diversify its credit exposure. In 2006 it had already stopped purchasing mortgage securities as it doubted in the credit quality and performance of the latter. The problem came from the fact that it has underwritten (sold) CDS much in excess of its balance sheet leading to almost the full erosion of its capital base.

48) 2009, United Commercial Bank (United States); credit loss of USD 1,4 bn

The bank followed a common path of institutions with over-concentrated mortgage lending portfolios. It failed when the housing crisis worsened.

49) 2009, Guaranty Bank (United States); credit loss of USD 3 bn

The bank failed from subprime mortgage crisis. It had mortgage-related assets on its balance sheet. Thus, it suffered from the contagion effect when interest rates repriced to higher levels in 2007 and borrowers stopped paying. A special feature of the bank's bankruptcy was that it first received state support in the form of USD 300m of TARP funds. But it was insufficient to resist the crisis shock.

50) 2009, Colonial Bank (United States); credit loss of USD 1,7 bn

The bank followed the path of narrow-specialized mortgage lenders. It increased losses when the housing bubble burst. One of its main borrowers was Taylor Bean company. When Taylor Bean filed for bankruptcy, Colonial followed soon afterwards. The case was recalled in 2018 when a new round of discussions about the role of external auditors became public. PwC, at the time the auditor of the Colonial, was blamed for having missed the fraudulent scheme.

51) 2009, AmTrust Bank (United States); credit loss of USD 2 bn

The bank had significantly expanded since its establishment in 1981. It had USD 190m at the start. Twenty years later it had already USD 25,5bn. Most of it was retail mortgages and loans to construction and building societies. The bank was impacted by overall market deterioration. When floating rates on retail mortgages were repriced in 2007, they brought client defaults and losses. In addition, there was a fraud component in its loss. One of bank's largest borrowers was Taylor Bean & Whitaker Mortgage Corporation. It used credit lines of the Colonial too much. To offset the credit risk, it offered mortgage bonds as collateral. The deficiency was that those bonds were in fact already sold to other investors leaving Colonial with no actual collateral.

52) 2010, HQ Bank (Sweden); credit loss of USD 0,16 bn

The bank experienced problems similar to the consequences of the housing market crash of 1990s in the United States with losses of Gibraltar Savings, City Federal Savings of 1989 and Goldome and Southeastern Bank in 1991. Having focused on retail mortgage lending, the bank suffered from a deterioration in client creditworthiness because of the fall in their revenues. There was also a shrinkage of the collateral base. The situation was worsened by a bank run.

53) 2015, Hypo Alpe-Adria-Bank International (Austria); credit loss of USD 12,28 bn

The bank was reorganized after its sale to Heta bank in 2014. It was meant to act as a non-performing asset container for the loan book created in 2007–2009. As the loans were completely delinquent, there were no material chances of recovery. To attract funding the bank was proud to say it had guarantees from the local government of Carinthia for EUR 11bn. When the halt of payment was enacted, the local government said it would need a granular review of bank activity to decide upon the payment of its announced guarantee line. The case is similar to Halifax Bank of Scotland in 2008.

54) 2016, Punjab National Bank (India); credit loss of USD 0,78 bn

The bank attributes the loss to the fraudulent activity of its traders. It is said that funds were transferred out of the bank by means of purchasing stock of affiliated Indian companies. Soon after the purchase, those equities were devalued to almost zero scoring losses for the bank. There were also Bank of India and State Bank of India losses in 2016. This resembles the situation with Yamaichi Securities in Japan in 1997 and Societe Generale in France in 2007 when credit loss might have had been substituted by an operational risk fraud.

55) 2016, Bank of India (India); credit loss of USD 0,91 bn

Bank of India is one of the largest Indian banks. Disregarding its name, it is not a central bank. It was nationalized in 1969, i.e. 63 years after its establishment. Bank lost on its credit portfolio. The most probable reason is the mild loan underwriting policy used to attract customer base within the government targets of enhancing financial inclusion.

56) 2017, State Bank of India (India); credit loss of USD 3,6 bn

Similar to Bank of India loss in 2016, the bank suffered from a deterioration in borrowers' creditworthiness. In fact, initial loan underwriting standards were too relaxed. We doubt that the loss was indeed as severe as reported in the Mass Media. The bank quotes grew by 23% during 2017, while the competitor's quotes fell. Thus, State Bank of India seems to have been a top-performer with +34% greater stock return than its peers.

6. Conclusion

There is no by the moment, to the best of author's knowledge, any exhaustive and complete description of financial loss cases at the global level. Thus, we were motivated to prepare a dataset to completely and correctly cover those. To make a data set of the world largest credit risk losses we mostly relied upon the publicly available mass media sources. However, where possible we cross-checked the mentioned by mass media loss figures against change in stock prices. The loss threshold was chosen as current USD 100m. As a result, we collected and investigated 56 world-largest credit risk losses that occurred since 1972 when banking regulation started becoming global. The total cumulative loss is current USD 700bn.

The paper novelty includes the following:

- 1) creation of complete database of the world largest credit-risk related losses that by the moment were covered by mass media;
- 2) identification of typical features of credit loss occurrence (presence of external triggers to stimulate lending and to stop it; rapid credit expansion; concentration of exposure, including via the securities purchase; overvaluation of collateral in economic boom times);
- 3) identification of the coincidence of simultaneous disclosure of credit and operational risk losses where latter could have been used to cover portion of the former.

Annex 1.

Table

Quantitative Details

Nº NEW	Year	Bank	Country	Under- lying	Went Bust	Age, years	TA, cur \$bn	Loss, cur \$bn	Loss- Assets, %	CPI to 2018, %
1	1974	Franklin National Bank of New York	United States	Loan	Yes	48	5,0	1,3	26,0	509
2	1975	Security National Bank of Long Island	United States	RE	Yes	72	1,8	0,1	5,8	467
3	1976	Hamilton National Bank of Chattanooga	United States	RE	Yes	87	0,5	0,2	33,4	441
4	1984	American Savings and Loan	United States	RE	Yes	62	30,0	3,3	11,0	242
5	1987	Merrill Lynch	United States	Sec		73	220,0	0,3	0,1	221
6	1988	First Republic Bank	United States	RE	Yes	68	25,4	3,9	15,2	212
7	1989	Mcorp	United States	RE	Yes	5	20,0	2,7	13,5	203
8	1989	Gibraltar Savings	United States	RE	Yes	68	15,1	0,3	1,7	203
9	1989	City Federal Savings	United States	RE	Yes	79	9,8	0,2	2,3	203
10	1991	Bank of New England	United States	RE	Yes	6	23,0	6,3	27,3	184
11	1991	Christiania Bank og Kreditkasse	Norway	RE	Yes	143	26,4	0,7	2,8	184
12	1991	Fokus Bank ASA	Norway	RE	Yes	132	6,5	0,2	2,7	184
13	1991	Goldome	United States	RE	Yes	8	9,9	1,5	15,2	184
14	1991	Den norske Bank	Norway	RE	Yes	169	22,8	0,5	2,4	184
15	1991	Spar + Leihkasse Thun	Switzerland	RE	Yes	125	0,8	0,2	20,0	184
16	1991	Southeastern Bank	United States	RE	Yes	89	16,0	0,5	3,1	184
17	1992	Sparbanken Sverige	Sweden	RE	Yes	50	84,5	6,5	7,7	179
18	1992	Skandinaviska Enskilda Banken	Sweden	RE	Yes	20	81,6	6,3	7,7	179
19	1993	Nordbanken	Sweden	RE	Yes	7	34,3	4,1	11,8	174
20	1993	Gota Bank	Sweden	RE	Yes	3	186,0	5,5	3,0	174
21	1996	Handelsbanken	Sweden	RE	Yes	125	128,1	3,3	2,6	160
22	1997	Hokkaido Takushoku Bank	Japan	RE	Yes	98	66,0	7,5	11,4	156
23	1997	Yamaichi Securities Company	Japan	RE	Yes	10	176,0	53,0	30,1	156
24	1998	Nippon Credit Bank	Japan	RE	Yes	41	106,0	27,0	25,5	154
25	1998	Long Term Credit Bank of Japan (LTCB)	Japan	RE	Yes	46	243,0	42,1	17,3	154
26	2007	Countrywide	United States	Loan	Yes	38	211,7	1,2	0,6	121

Continues

Nº NEW	Year	Bank	Country	Under- lying	Went Bust	Age, years	TA, cur \$bn	Loss, cur \$bn	Loss- Assets, %	CPI to 2018, %
27	2007	Bear Stearns	United States	RE	Yes	84	395,4	1,6	0,4	121
28	2008	Société Générale	France	Sec		144	1567,8	19,0	1,2	117
29	2008	Merrill Lynch	United States	RE	Yes	94	61,9	24,0	38,8	117
30	2008	The Royal Bank of Scotland Group (RBS)	United Kingdom	RE		281	3587,2	114,1	3,2	117
31	2008	Citigroup	United States	RE		196	1938,0	37,1	1,9	117
32	2008	Wachovia	United States	RE	Yes	129	812,4	23,9	2,9	117
33	2008	Wells Fargo	United States	RE	Yes	156	1309,6	47,4	3,6	117
34	2008	Fortis	Belgium	RE	Yes	18	92,9	37,0	39,8	117
35	2008	Norinchukin Bank	Japan	RE		85	569,6	2,7	0,5	117
36	2008	Halifax Bank of Scotland (HBOS)	United Kingdom	RE	Yes	7	389,8	29,2	7,5	117
37	2008	Dresdner Bank	Germany	RE	Yes	136	329,7	1,9	0,6	117
38	2008	Credit Suisse	Switzerland	RE		152	1173,7	10,8	0,9	117
39	2008	Deutsche Bank	Germany	RE		138	3105,9	7,3	0,2	117
40	2008	Hypo Real Estate	Germany	RE		5	503,4	3,9	0,8	117
41	2008	Washington Mutual (WaMu)	United States	RE	Yes	119	307,0	67,0	21,8	117
42	2008	Morgan Stanley	United States	RE		73	987,4	13,9	1,4	117
43	2008	IndyMac Bank	United States	RE	Yes	23	32,0	10,7	33,4	117
44	2008	Union Bank of Switzerland (UBS)	Switzerland	RE		154	2015,1	32,8	1,6	117
45	2008	Downey Savings and Loan Association	United States	RE		51	12,8	0,5	4,3	117
46	2008	Bayerische Landesbank	Germany	RE		36	415,6	3,8	0,9	117
47	2009	Bank United	United States	RE	Yes	25	12,8	4,9	38,3	117
48	2009	United Commercial Bank	United States	RE	Yes	35	11,2	1,4	12,5	117
49	2009	Guaranty Bank	United States	RE	Yes	21	13,0	3,0	23,1	117
50	2009	Colonial Bank	United States	RE	Yes	28	25,5	1,7	6,7	117
51	2009	AmTrust Bank	United States	RE	Yes	120	12,0	2,0	16,7	117
52	2010	HQ Bank	Sweden	Sec	Yes	20	4,2	0,2	3,8	115
53	2015	Hypo Alpe-Adria-Bank International	Austria	Loan	Yes	119	20,1	12,3	61,1	106
54	2016	Punjab National Bank	India	Sec		122	98,3	0,8	0,8	105
55	2016	Bank of India	India	Loan		110	91,6	0,9	1,0	105
56	2017	State Bank of India	India	Loan		211	575,1	3,6	0,6	102

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