EUROPEAN DATAWAREHOUSE

CFA Lecture

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The European ABS Market and its Development

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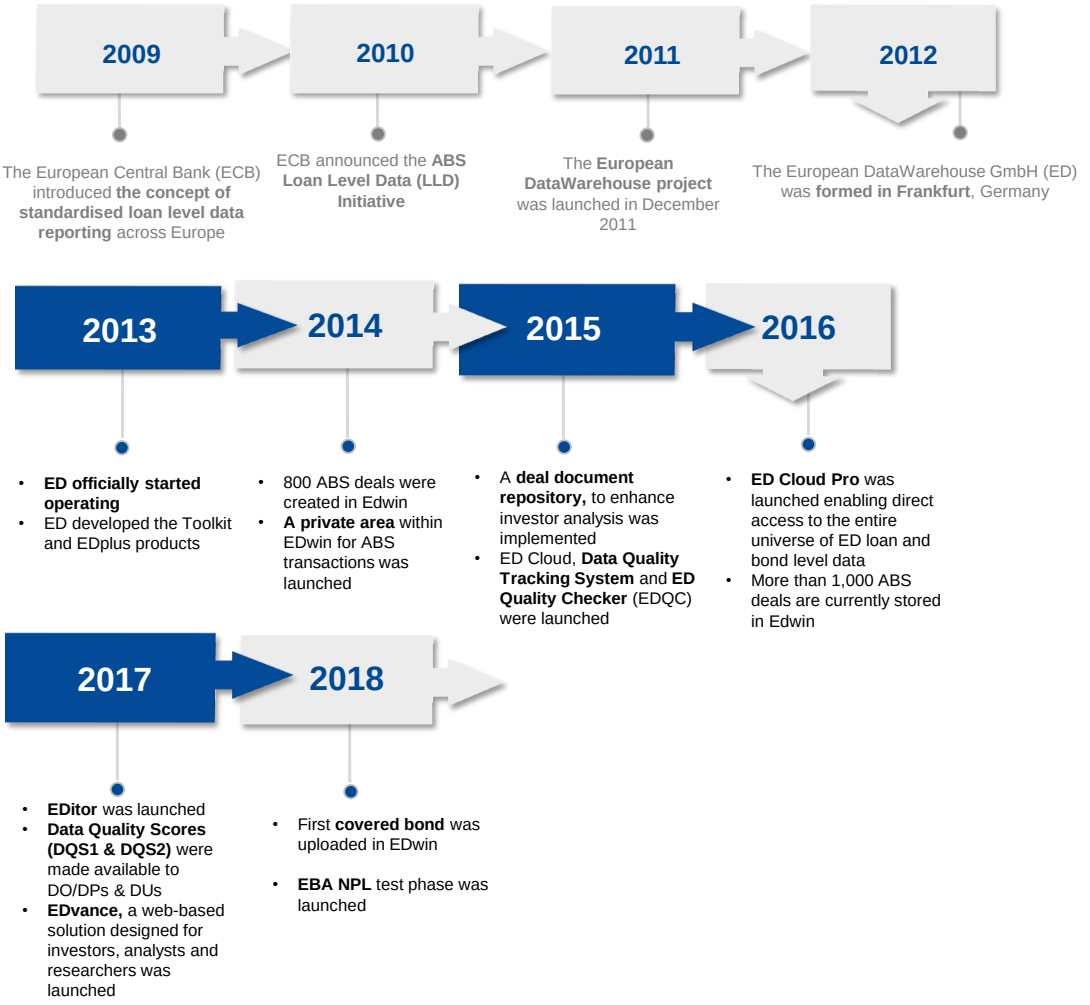
1 About ED

European DataWarehouse (ED) is the first central data warehouse in Europe for collecting, validating and making available for download detailed, standardized and asset class specific loan-level data (LLD) for Asset-Backed Securities (ABS) transactions. Developed, owned and operated by the market, ED helps to facilitate risk assessment and to improve transparency standards for European ABS deals.

Currently, ED serves more than 500 data owners, data providers and data users. Originators, issuers, sponsors and servicers upload ABS data to ED, while the data users including investors, data vendors, rating agencies and public institutions, use ED data for monitoring and risk assessment purposes.



Currently, ED stores more than 64 million[1] unique loans across Europe, allowing in-depth loan analysis and key insights into the drivers of credit performance as well as the ability to "slice and dice" the data and compare it across deals, issuers and countries.

The submission of loan-level data occurs on a monthly or at least on a quarterly basis, no later than one month following the due date for interest payments. Given this frequency of loan data submissions and the consistency of loan identifiers across submissions, specific time series analysis and cohort analysis can be performed. Nevertheless, the centralized collection of granular credit data and credit risk information at the individual loan level often presents challenges for European institutions in terms of achieving and maintaining strong and consistent data quality which adheres to the standardized templates.

While there are many different reasons for data quality issues, they can in general be allocated to one of the following three broad categories:

- Insufficient clarity of definition of data fields
- Erroneous data entries
- Inconsistencies of the data field content

The latter two pose significant challenges for data users when running performance analysis. ED has developed over the years a sophisticated data quality management platform, consisting of thousands of automated quality checks and in-depth manual analysis to ensure a high level of data quality. While many errors can be identified at the individual loan level, the high number of loans in a given transaction requires a multi-step data quality analysis.

To further enhance transparency and comparability, ED developed certain tools, including Field Commentaries, Adjusted Values for Arrears and Income, Normalized Geo Codes and others. All of these eventually contributed to a research showcases, presented in Chapter 3.

[1] As of October 2018

2 The European ABS Market Through Today

Following the issuance peek in 2008, a financial crisis led to a downturn in the European ABS market which resulted in lower year-to-year volumes and higher retention ratio. Figure 1 illustrates a sharp decline in ABS issuance between 2008 and 2013, accompanied with a high retention ratio, where only 17.5%[2] of new issuance between 2008-2012 was placed among investors.

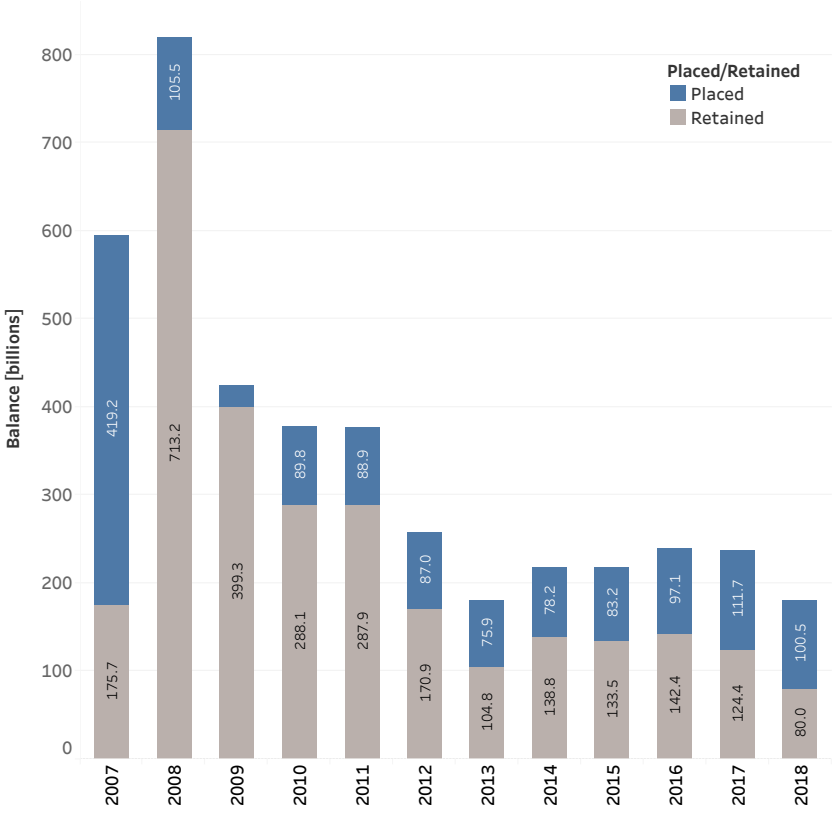


Figure 1: European ABS Issuance by Placed/Retained [2007 - Q3 2018]

After a minimum issuance of €180.7 million in 2013, both volume and placed ratio have improved, yet it is still not comparable to market size prior 2008. Nevertheless, we expect 2018 to be the first year after 2007 when volume of placed bonds exceed its retention across the European ABS market. Upcoming funding needs following the end of the ECB's ABS Purchase Program (ABSPP) are expected to further boost both the volume and the ratio of placed transactions.

[2]Source: Association for Financial Markets in Europe (AFME), publicly available

Figure 2 shows further breakdown by asset class, proving that Residential Mortgage Backed Securities (RMBS) continue to be the most prominent sector in the European ABS market. Nevertheless, as from 2013, the share of RMBS decreased, averaging only at 47.4%, which is considerably lower compared to earlier years.

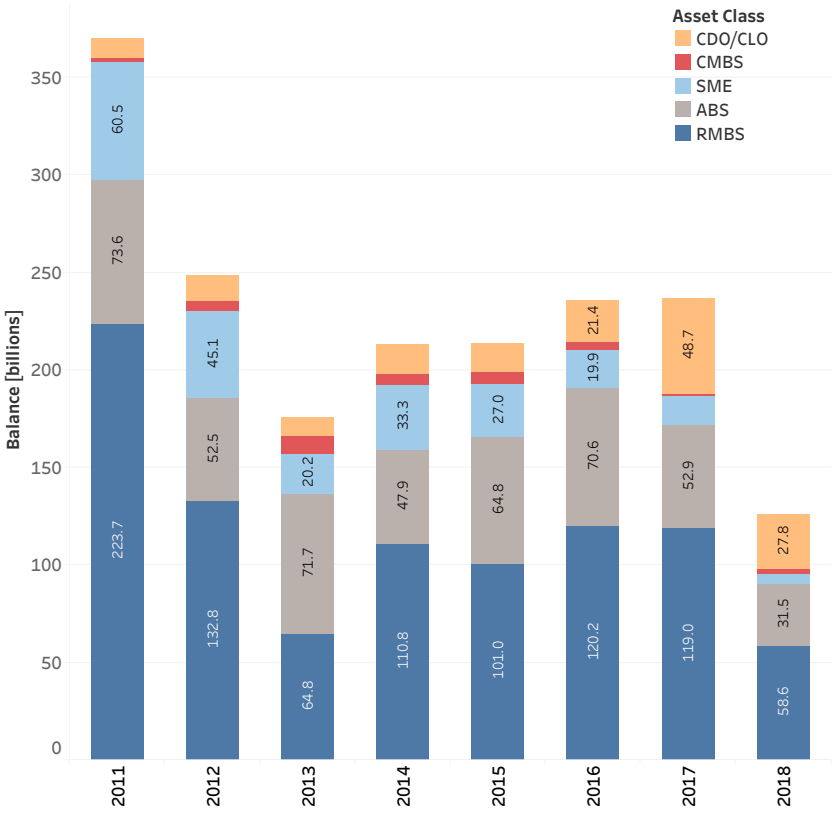


Figure 2: European ABS Issuance by Asset Class [2011 - Q2 2018]

When displaying the data by jurisdiction, we can observe a relative decline in countries typically focused on RMBS issuance, represented by the Netherlands and United Kingdom. Besides this, Figure 3 shows that French, Italian and Spanish markets stayed stable in terms of ABS issuance over the years examined.

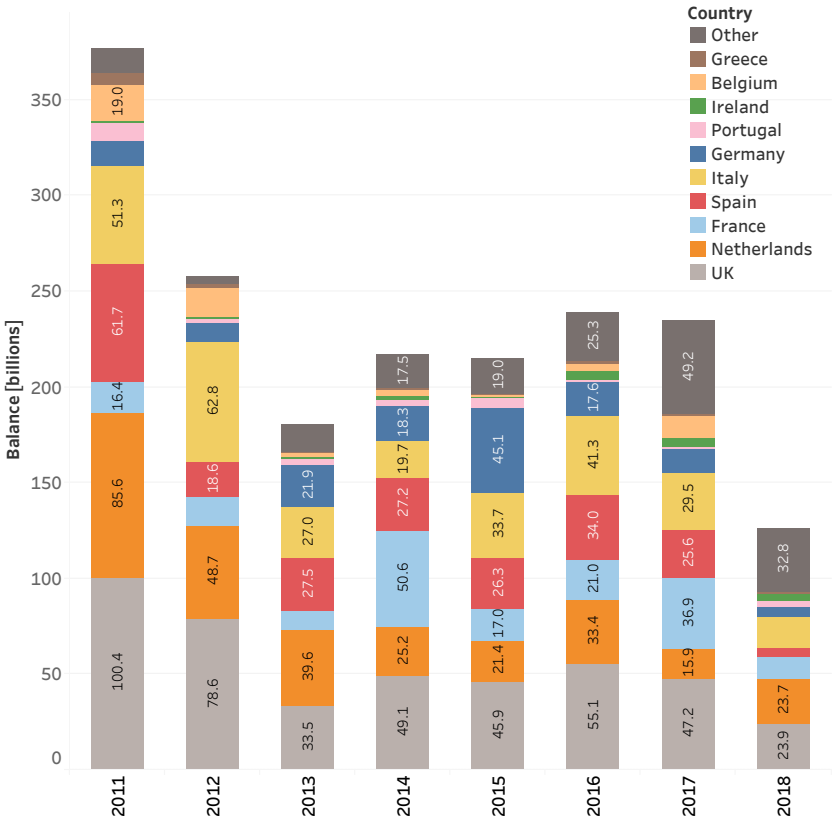


Figure 3: European ABS Issuance by Country [2011 - Q2 2018]

3 Market Research

In this section, we provide some specific examples which leverage loan-level data to facilitate research done on some recent significant market events. We will present the possibilities that loan-by-loan analysis offers (standardized templates, crosscheck analysis etc.). The three subsequent examples should be understood as a supporting ex-post analysis, complementing other research publicly available.

3.1 Market Research 1 - Italian NPLs

Historically, Italy has been the most fragmented banking sector in terms of RMBS issuance, represented by 45 different ABS market participants, followed by the Netherlands and the UK. According to ED's data, there were 137[3] RMBS deals issued in Italy with a total original balance of €188.3 billion.

Our analysis, based on over 26 million records representing loans originated in Italy, will discuss the influence of OLTV on default rates and maturity extension, trying to prove any relation between these attributes.

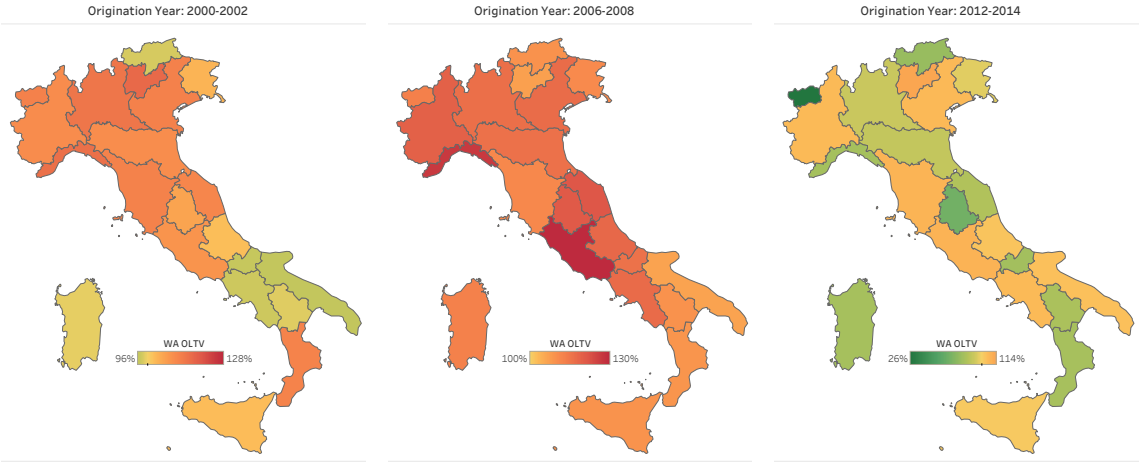


Figure 4: Average OLTV for Defaulted Loans in Italy by NUTS 2 Regions

By analyzing over 645,000 non-performing loans (NPLs) in Italy, originated between 1992 and Q3 2018, one may observe a correlation between default rates and OLTV level. Figure 4 illustrates three time periods: 2000-2002, 2006-2008 and 2012-2014, which provide further insight into relationship between loan performance and OLTV during market distress.

[3]Only active transactions and loans as of January 1, 2013 or later are considered

The Italian market used to enjoy relatively friendly-lending practices, which allowed high OLTV financing, commonly seen before 2008. It is clear that during market stress, loans with lower down payments (represented by higher OLTV) will be more impacted compared to borrowers using mortgage to finance smaller fraction of the property value. This is evident when looking at loans originated between 2006 and 2008, where average OLTV of defaulted loans ranges from 100% to 130%, as shown in Figure 4.

We believe that prior to loan default, borrowers try to alter conditions of their loans when facing financial difficulties. Banking practices offer a range of options, serving to avoid a generally very costly and time-demanding foreclosure process. Despite government efforts[4], the current length of foreclosure process in Italy ranks among the slowest in Europe with an average time of 6-8 years. One of the tools used to avoid immediate default is maturity extension of already granted loans, a practice commonly referred to as loan renegotiation. The next figure (5) shows distribution of Italian loans recording an extension in years (Y axis) by certain OLTV levels (X axis). Here we can see that loans with higher OLTV tend to exhibit higher maturity extension.

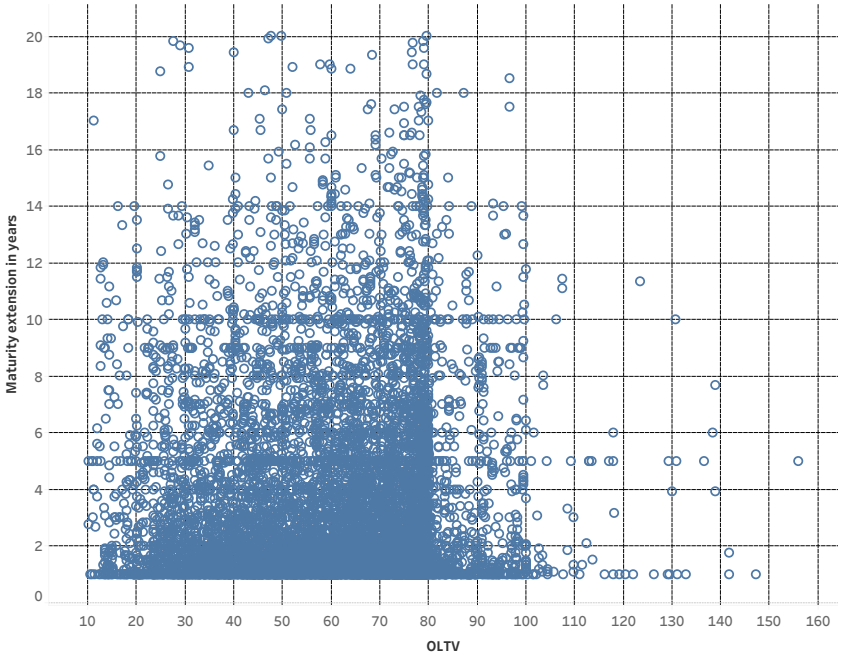


Figure 5: Distribution of Loans with Maturity Extension

[4]Source: Reuters, available online

Bucket	from OLTV	to OLTV	AVG Extension	Loans Extended
B1	0	60	6.875 years	0.34%
B2	60	80	7.791 years	0.54%
B3	80	200	7.886 years	0.63%

Table 1: Average Extension by OLTV Bucket

Additionally, it can be observed that loans with extended maturity are likely to appear in the left quadrant, bracketed by OLTV valued at 80%, which is considered an industry standard in banks' lending practices[5]. By grouping the loans in Table 1 into 3 buckets, we may conclude that OLTV is positively correlated to both average extension and ratio of loans extended for a given bucket[6] measured by number of loans extended over total number of loans per given OLTV bucket.

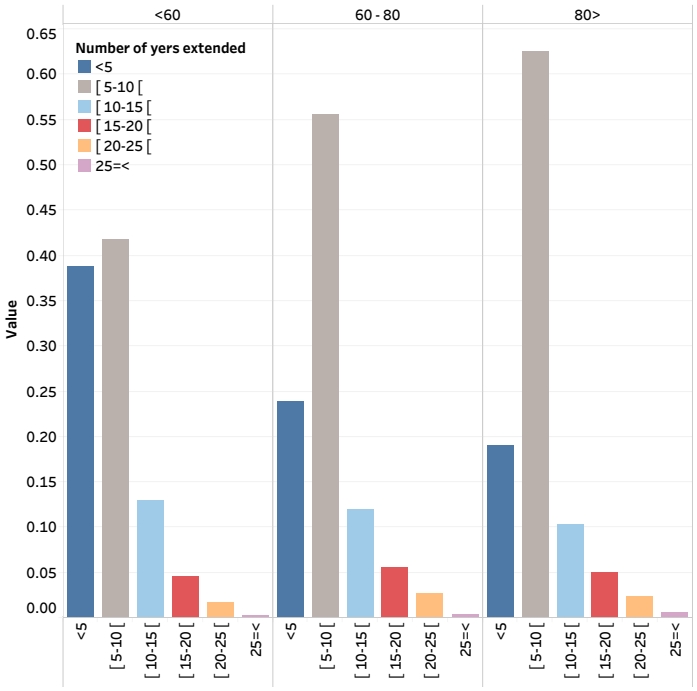


Figure 6: Distribution of Extension by OLTV Bucket

This data can be further broken down into years of extension by OLTV buckets, providing better insight into extension distribution among given OLTV buckets, as shown in figure (6). Here we can see that maturity extension of more that 10 years

[5]May vary depending on business cycle phase

[6]Lower end of the interval is excluded, upper end of the interval is included; mathematically:]from,to]

stays unchanged irrelevant of OLTV level, whereas 5-10 year bucket exhibits positive correlation and bucket representing loans with extension lower than 5 years shows negative correlation with OLTV level.

Surprisingly, we cannot derive any clear correlation with default rates when plotting the loans with maturity extension back on a map. Figure 7 shows 121,000 loans extended and 645,000 loans defaulted as a ratio of all loans originated in Italy over the period examined. It could be noted that southern regions in Italy report higher default ratios (particularly Calabria and Sicilia), compared to northern regions. Other southern regions, such as Basilicata and Puglia, report relatively high default ratios as well, but compared to extension ratio in these regions, we cannot observe these high rates any more. Similar observation can be made in the Milan area, whereas region Trentino-Alto Adige/Südtirol shows reversed situation.

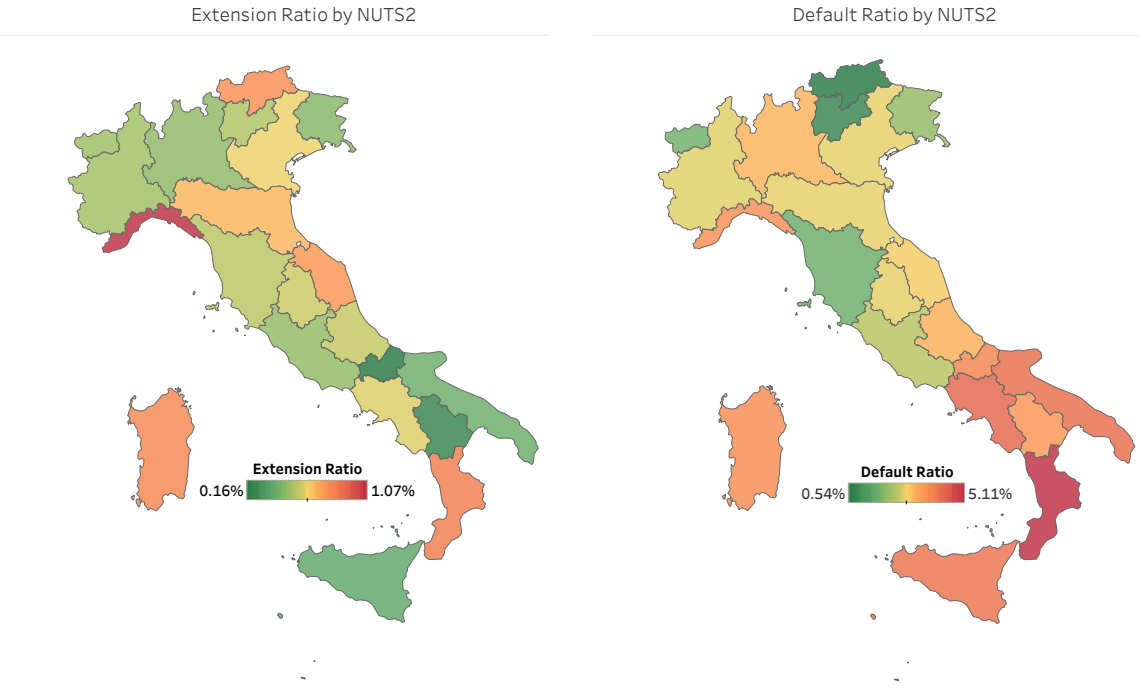


Figure 7: Average Extension and Default Ratio in Italy by NUTS 2 Regions

From our analysis, we conclude that OLTV is a likely driver of defaults whereas maturity extension exhibits relatively low correlation with defaults. Further cross-field analysis could be conducted, using other values reported in order to identify other factors contributing to our conclusion.

3.2 Market Research 2 - Volkswagen

The European AUTO ABS market grew until 2014 when it peaked on at issuance amount of €28 billion. Since then, we have seen a sharp decline in 2017 and a positive upward trend in 2018. Geographically, Germany has been the biggest market, when measured by the volume of issuance per year, over the years examined. The trend in Germany has experienced more volatility compared to other key AUTO ABS markets in Europe. After the German market reached on issuance amount of €16 billion in capitalization in both 2014 and 2015, the volume decreased to 13.4 and 8.1 billion euros in 2016 and 2017, respectively. In terms of the overall European AUTO ABS market, the decrease in Germany was gauged by increased activity in the UK, Spain and Italy from 2016-2018.

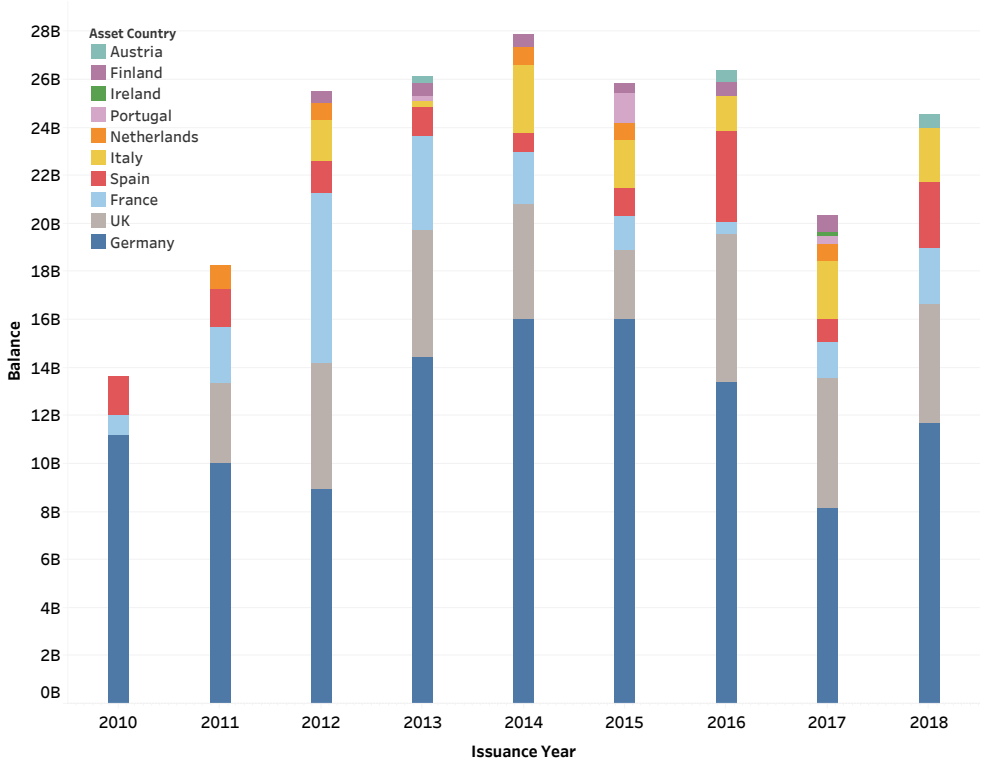


Figure 8: Volume of New AUTO Issuance in Million Euros by Vintage [1/2010 - 10/2018]

On September 18, 2015, the US Environmental Protection Agency (EPA) publicly announced in a "Notice of Violation" that irregularities in relation to nitrogen oxide NO_x emissions had been discovered in emissions tests on certain vehicles of Volk-

swagen Group with type 2.0 l diesel engines in the USA. In this context, Volkswagen AG (VW) announced that noticeable discrepancies between the figures achieved in testing and in actual road use had been identified in around eleven million vehicles worldwide with type EA 189 diesel engines[7].

The issue stemmed from VW's turbocharged direct injection (TDI) diesel engines with a software, capable of manipulating NO_x output to meet US emission limits during laboratory emission testing. The VW models affected are Jetta, Beetle, Golf and Audi A3 produced between 2009 and 2015, and VW Passat from 2014-15.

The following paragraphs will elaborate on how these events have affected deals issued by VW, a large market participant, responsible for a significant volume of ABS issuance.

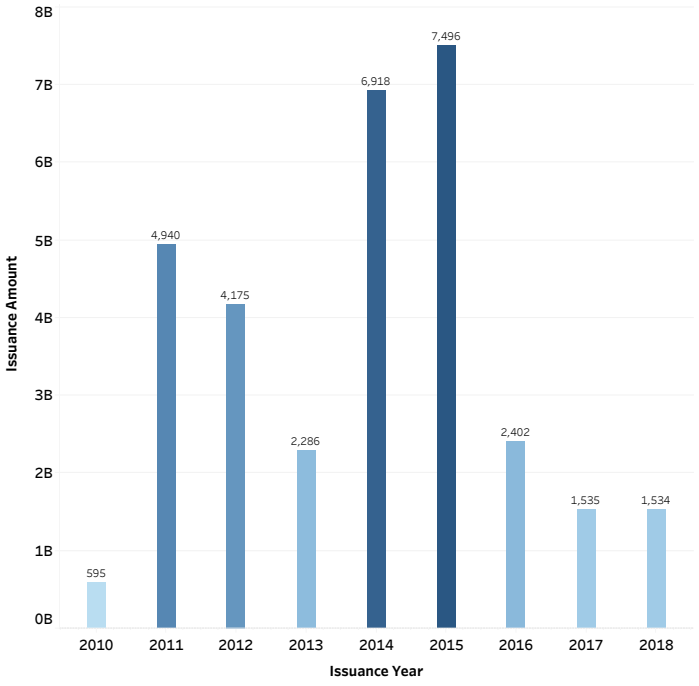


Figure 9: Balance of Loans in Million Euros Securitized by VW in Germany [1/2012 - 10/2018]

In 2014 and 2015, VW covered 43% and 47%[8] of the German market when measured by notional value of bonds issued. Figure 9 illustrates aggregated value of bonds

[7]Source: Key event issues, volkswagenag.com, available online
[8]Source: European DataWarehouse

issued by VW by vintage. While representing around 45% of the German market in 2014 and 2015, the issuance dropped significantly in the following three years. Despite overall German AUTO market slowdown, the loans securitized by VW decreased at faster pace, representing only 18% of the German market in both 2016 and 2017 and only 13% in 2018.

Surprisingly, it is not just the absolute volume of loans securitized by VW that decreased in 2016 and 2017, but the number of newly originated loans too. By analyzing more than 3.8 million loans, securitized and originated by VW between 2012 and October 2018, we can clearly see a slow-down of VW's securitization activities. As suggested by Figure 10, the number of loans originated has decreased by 42% in 2016 and further by 9% in 2017[9].

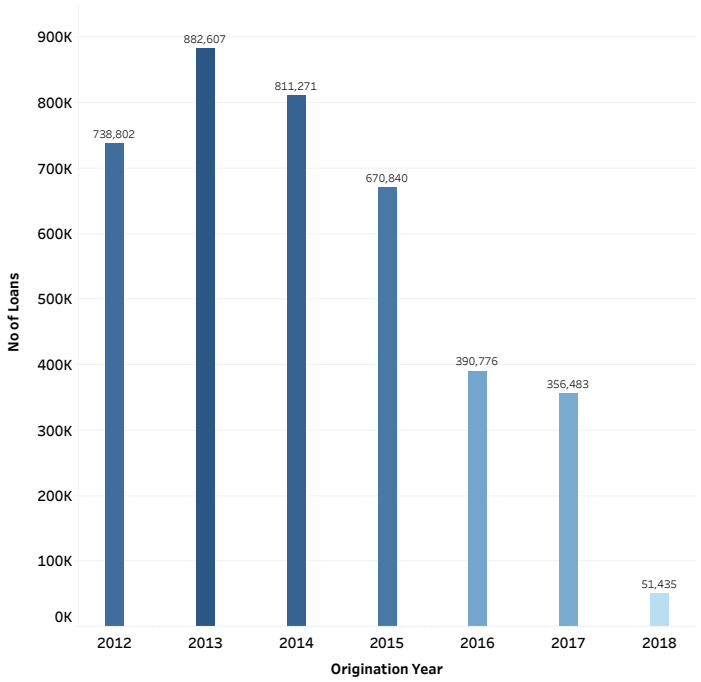


Figure 10: Number of Loans Originated in the Same Year [1/2012 - 10/2018]

Noticeably, not only securitization decreased but conducting further analysis, we can observe structural changes within portfolios in terms of loan origination. Figure 11 shows vintage year (X axis) against number of years by which the loan origination lags given vintage year, referred to as "Origination deviation". It reveals that after 2015, VW lowered participation of loans originated in the same year as the vintage

[9]2016 and 2017 originations may increase following new transactions issued in late 2018 or 2019, however, we do not expect this to truncate the trend significantly

of the portfolio, favoring rather loans with higher seasoning at securitization date. In other words, a portfolio with vintage of 2016 comprises only 27% loans originated in 2016 compared to 36% loans originated in 2015 and securitized in 2015 portfolio.

	Origination deviation					
Vintage	0	1	2	3	4	5
2013	23%	53%	18%	4%	2%	1%
2014	30%	54%	14%	2%	0%	0%
2015	36%	42%	15%	5%	1%	0%
2016	27%	48%	17%	7%	1%	1%
2017	28%	56%	13%	2%	1%	0%
2018	11%	55%	18%	10%	5%	1%

Figure 11: Distribution of Loans Across Vintage and Origination Deviation

We believe that increased seasoning could be another way of VW providing investors with additional security in response to higher risk, arguably posed by a drop in residual value of the diesel cars.

Comparing the figures above, one may conclude that the AUTO ABS market in Europe experienced a noticeable drop in 2017 but is expected to recover in 2018. Volkswagen, however, has been declining its ABS activities since 2015, arguably driving the performance of the overall German AUTO ABS market. It could be concluded that market developments since 2015 have led to a downturn of securitization activities for AUTO loans in Germany, measured by both number of loans and original outstanding balance across all pools issued each year. This, however, contrasts with positive development of the European securitization market as whole, discussed in Chapter 2. Furthermore, since 2013, pools issued by VW have experienced decreasing trend of number of loans originated within this period and exhibited noticeable increase of seasoning.

3.3 Market Research 3 - Banco Popular

On June 7, 2017, Banco Santander agreed to acquire Banco Popular after the EU authorities declared the Madrid-based lender "failing or likely to fail"[10]. The acquisition took place following an auction conducted by the Single Resolution Board and FROB in which Banco Santander was selected as the successful bidder, paying a notional consideration of €1.

The following figure (12) provides credit ratings and financing costs of both entities one month prior the acquisition, released by Banco Santander[11].

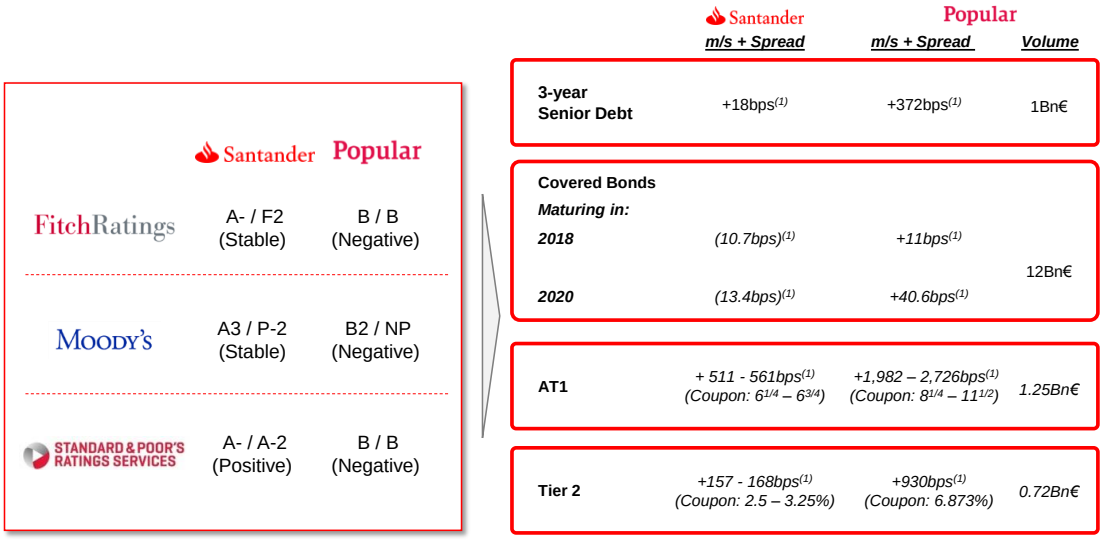


Figure 12: Costs of Financing - Santander and Banco Popular

According to the New York Times, "Banco Popular's problems can be traced back to the mortgage mania of over a decade ago. Toxic home loans, moldering on its books all these years, were a major cause of its collapse"[12].

During the leadership of Angel Ron (chairman from 2004 - 2017), shares of Banco Popular lost around 95 percent of their value as the lender struggled to rid its books of toxic real estate assets [13]. The Spanish High Court is investigating the role of former Banco Popular chairmen Angel Ron and Emilio Saracho in Banco Popular's collapse following complaints by shareholders. The former directors have denied any

[10]Source: ECB website, Banking Supervision press release, available online
[11]Source: Santander.com, available online
[12]Source: New York Times, available online
[13]Source: Reuters, available online

wrongdoing[14].

By analyzing loan level-data of nearly 200,000 residential mortgage loans originated by Banco Santander and Banco Popular and securitized between 2002 and 2015, one may be able to compare underlying borrower and collateral attributes based on their vintage between the two entities discussed.

Figure 13 represents average OLTV value reported by securitized mortgage loans on yearly basis by both Banco Santander and Banco Popular. There is a noticable sustainable trend of average OLTV between years 2000 and 2005 reported by both banks. In 2006, however, Banco Popular raised its average OLTV by nearly 37% from 71.3 to 97.5%, resulting in an increase of 26.2 percentage points. Since 2006, the average value had been slightly growing until reaching its peak in 2015 which was the last year Banco Popular originated any loans under the ABS framework. Although it is common practice in Spain to securitize loans with relatively high OLTV as they are not Covered Bond eligible[15], it is the shift in trend as of 2006 that raises concern.

For illustration purposes, Figure 13 also depicts average OLTV for the same period provided by Banco Santander, showing no significant trend changes.

Figure 13: Average OLTV by Origination Year

[14]Source: Reuters, available online

[15]Among others, in Spain, OLTV lower than 80% is prerequisite for loans serving as collateral in covered bond pools

In parallel, Figure 14 shows that Original Valuation of the collateral has dropped, suggesting more aggressive lending policies from 2006. In our opinion, these policies may have been implemented with an aim of increasing Banco Popular's residential credit market share. The reason could be Banco Popular's historical focus and core business related rather to the SME market with comparably smaller exposure to RMBS.

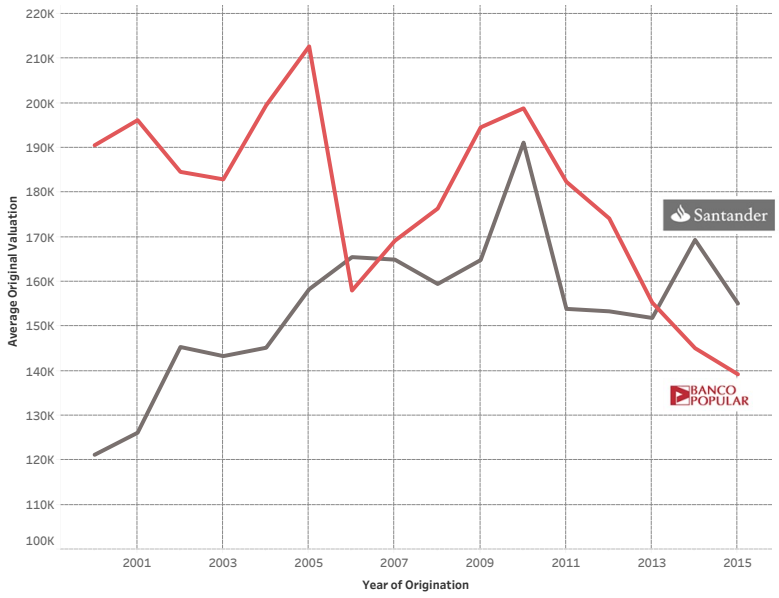


Figure 14: Average Valuation by Origination Year

The combination of higher OLTVs with lower collateral valuation at origination reflects a sudden appetite for less collateralized loans with lower down payments, ultimately posing higher risk.

Loan attributes may be an important source of borrower level information as well where time series help to understand how lending standards have evolved over time. Interestingly, evolution of primary income and borrowers' average age demonstrate changes in 2006 too. The following charts (Figure 15) plot average primary income and average borrower age on the vertical axis and origination year on the horizontal axis. Clearly, Banco Popular exhibited relatively conservative lending policy in terms of average primary income until 2005, falling €13,962 on average in 2006. Similar development can be observed when examining average borrower age, where Banco Popular reported average age slightly above 37 in 2005 and only around 32 in 2006 and 2007.

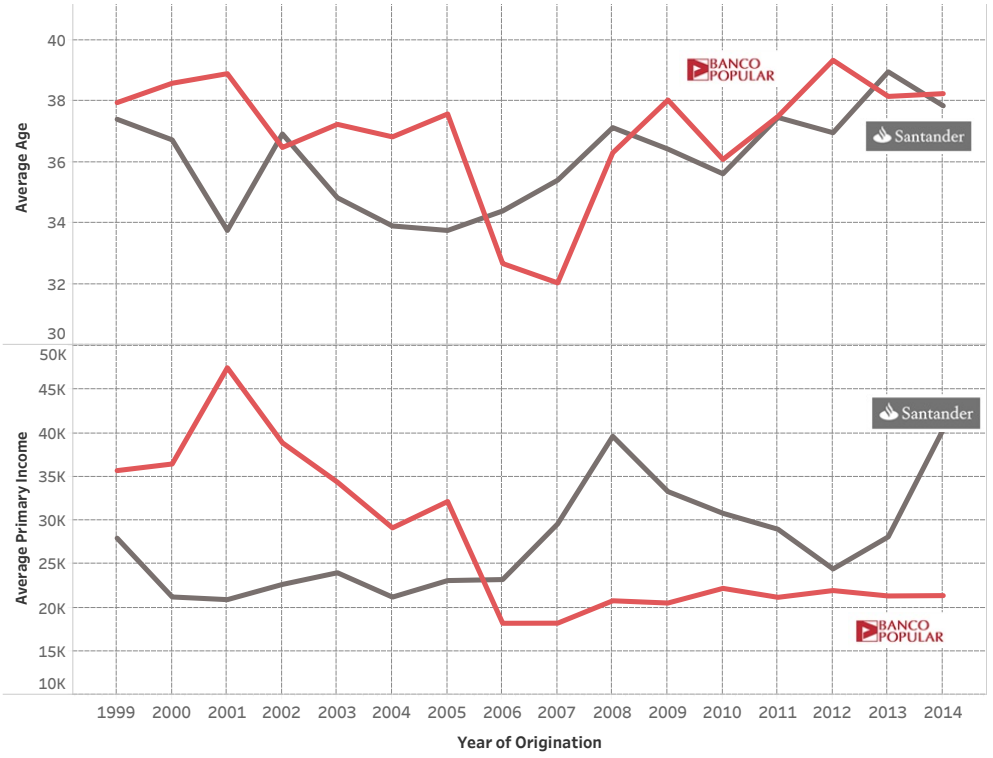


Figure 15: Average Age and Average Primary Income by Origination Year

It is worth pointing out that the researched time period corresponds with a market upswing, which caused a very competitive residential credit issuance environment between 2002 and 2007. This, among others, could be attributed to a change in Banco Popular's risk appetite, supervised by Angel Ron.

It is yet to be analyzed how competitive credit markets and more relaxed lending practices put in practice by Banco Popular from 2006 have contributed to the group's financial stability, resulting in bail-out by Banco Santander on June 2017.

4 The ABS Market in 2019

As discussed in the first chapter of this research, the loan-level data initiative[16] has been in place for more than 5 years, aiming to improve transparency and confidence in the European securitization market, while covering key asset classes (RMBS, SME, Consumer, Auto, Leasing, Credit Card). Over this time, the market participants such as rating agencies, investors, researchers and regulatory entities acknowledged loan-by-loan reporting as an acceptable and standardized input for credit modeling, risk assessment and due diligence, among others[17].

After this period, the current market regulation, supervised by the European Central Bank (ECB), has been further enhanced, resulting into a new regulation, commonly known as Simple Transparent and Standardized (STS). This was published under (EU) 2017/2402 on December 28, 2017 in the Official Journal of the European Union and applies from January 1, 2019.

The STS regulation consists of two parts. The first part of the regulation provides a common set of rules that apply to all securitizations, whereas the second part defines the criteria that qualify for STS securitization regulatory treatment. The following figure (16) depicts current status[18] of the various Implementing Technical Standards (ITS) and Regulatory Technical Standards (RTS), being developed by the European Banking Authority (EBA) and the European Securities and Markets Authority (ESMA), with direct impact on the securitization market.

ESA	Technical standards, Guidelines & Recommendations	Status
ESMA	RTS on the application for registration as a securitisation repository	Under development
ESMA	Technical advice on fees for securitisation repositories	Under development
ESMA	STS notification	Under development
ESMA	RTS on disclosure requirements	Final draft submitted to EU Commission
ESMA	XML schema for reporting templates	Under development
ESMA	RTS on operational standards and access conditions	Under development
ESMA	Third party firms providing STS verification services	Under development
EBA	ITS on Supervisory Reporting amendments with regards to COREP securitisation	Under development
EBA	RTS on the calculation of K_{sb} in accordance with the purchased receivables approach	Under development
EBA	Guidelines on the STS criteria for ABCP and non-ABCP securitisation	Under development
EBA	RTS on risk retention	Final draft submitted to EU Commission
EBA	RTS on the homogeneity of the underlying exposures in securitisation	Final draft submitted to EU Commission
EBA	Discussion Paper on the Significant Risk Transfer in Securitisation	Under development
EBA	Guidelines on implicit support for securitisation transactions	Final draft translates into the EU languages

Figure 16: Regulation Progress

[16] Source: ECB, available online

[17] Source: Fitch Ratings – European RMBS Rating Criteria, available online, Moody's research, available online and Scope's research, available online

[18] As of October 25, 2018

Despite significant importance of all guidelines (particularly risk retention, asset homogeneity or STS criteria) one may shortlist Disclosure Requirements as being one of the key drivers of the amount and quality of new ABS exposures available to the market participants from 2019 onwards.

When comparing disclosure requirements under the STS regulation to the ECB's current framework, the following key changes could be listed out:

1. Private transactions will be, for the first time, required to report loan-level data and investor reports
2. New asset classes have been introduced, including Colaterized Loan Obligations (CLO), Esoteric Transactions and Non-Performing Loans (NPE)
3. Reporting will be carried out using new data templates, further introducing standardized templates for investor reports, Inside information and significant events
4. ABCP transactions will fall, for the first time, under disclosure regulation
5. Inclusion of energy efficiency fields (Energy Performance Certificate, Certificate Provider) within Residential Real Estate mortgages (RRE), AUTO, Leasing and Consumer

Securitization Regulation (EU) 2017/2402	ESMA Templates	Public securitizations	Private securitizations
Article 7(1)(a)	Underlying exposures	✓	✓
Article 7(1)(e)	Investor Report	✓	✓
Article 7(1)(g)	Inside Information	✓	✗
Article 7(1)(f)	Significant Event	✓	✗

Figure 17: Reporting of Private Transactions

Clearly, STS will bring several improvements while leveraging current reporting practices. New templates will bring more standardization across asset classes, ultimately providing a better basis for due diligence, risk assessment etc.

On the other hand, the uncertainty with regards to deadlines, technical standards proposed but not yet approved by the European Commission, as well as an unclear transition period, will certainly influence market issuance in 2019, specifically in the first 6 months. Those entities with enough funding obtained by December 2018 are expected to delay further issuance in order to avoid potential regulatory issues, mostly due to a lack of common understanding among ABS market stakeholders. This is related mainly to the uncertainty regarding conditions under which STS

certification will be obtained. It is important to note that the STS label will impact the level of capital release and it is likely to play a role in ABS bond pricing.

In this uncertain regulatory environment we may see a shift to other funding options such as Covered Bonds or Additional Asset Claims (ACC) in some jurisdictions. Nevertheless, we expect a positive impact of the regulation to materialize during late 2019 or early 2020 by providing a further support to a development of the European ABS market.

5 References

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