EUROPEAN
DATAWAREHOUSE

Q1 2024 RESEARCH UPDATE

21 MARCH 2024

ON TODAY'S CALL

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AGENDA Q1 2024

EDW PUBLICATIONS

- Ludovic Thebault, European DataWarehouse

EBE REPORT ON PRIVATE SECURITISATIONS

- Ludovic Thebault, European DataWarehouse

EPC DATA AVAILABILITY

- Ludovic Thebault, European DataWarehouse

ROLL RATES

- Ludovic Thebault, European DataWarehouse

CONSTANT DEFAULT RATES

- Ludovic Thebault, European DataWarehouse

CUMULATIVE DELINQUENCIES

- Usman Jamil, European DataWarehouse

GAS PROJECT UPDATE

- Usman Jamil, European DataWarehouse

TEXTUAL DISCLOSURE IN PROSPECTUSES AND INVESTOR'S SECURITY PRICING

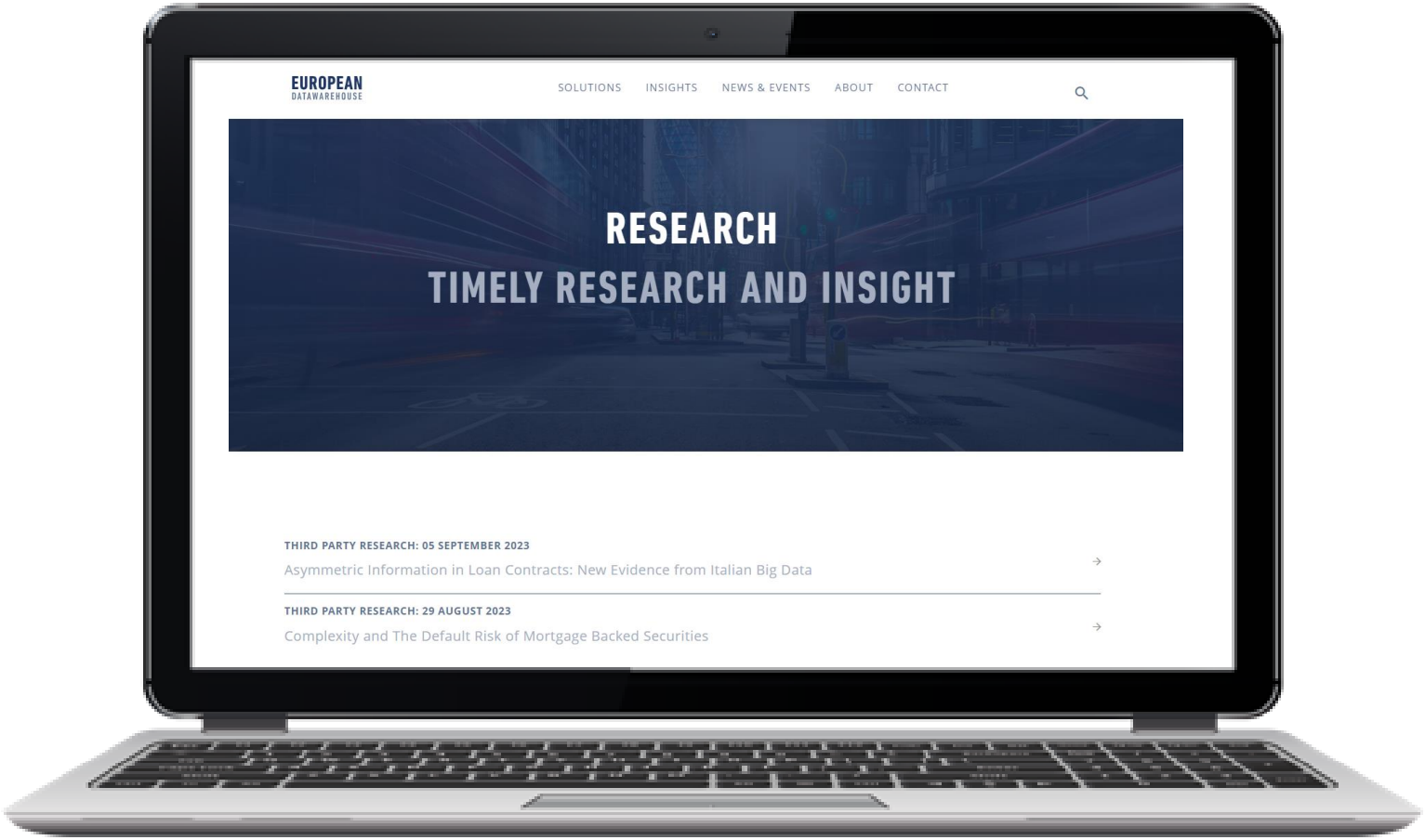
- Dr Philipp Klein, University of Münster/University of Paderborn

Q & A

EDW PUBLICATIONS

RESEARCH SECTION

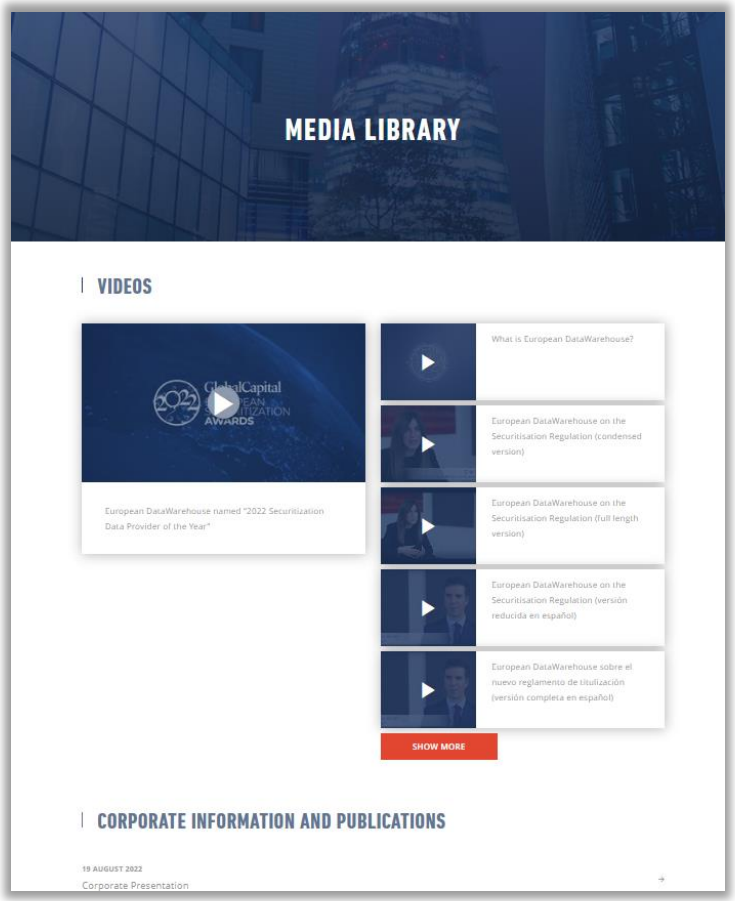
Our own publications, plus third-party research https://eurodw.eu/knowledge/research/

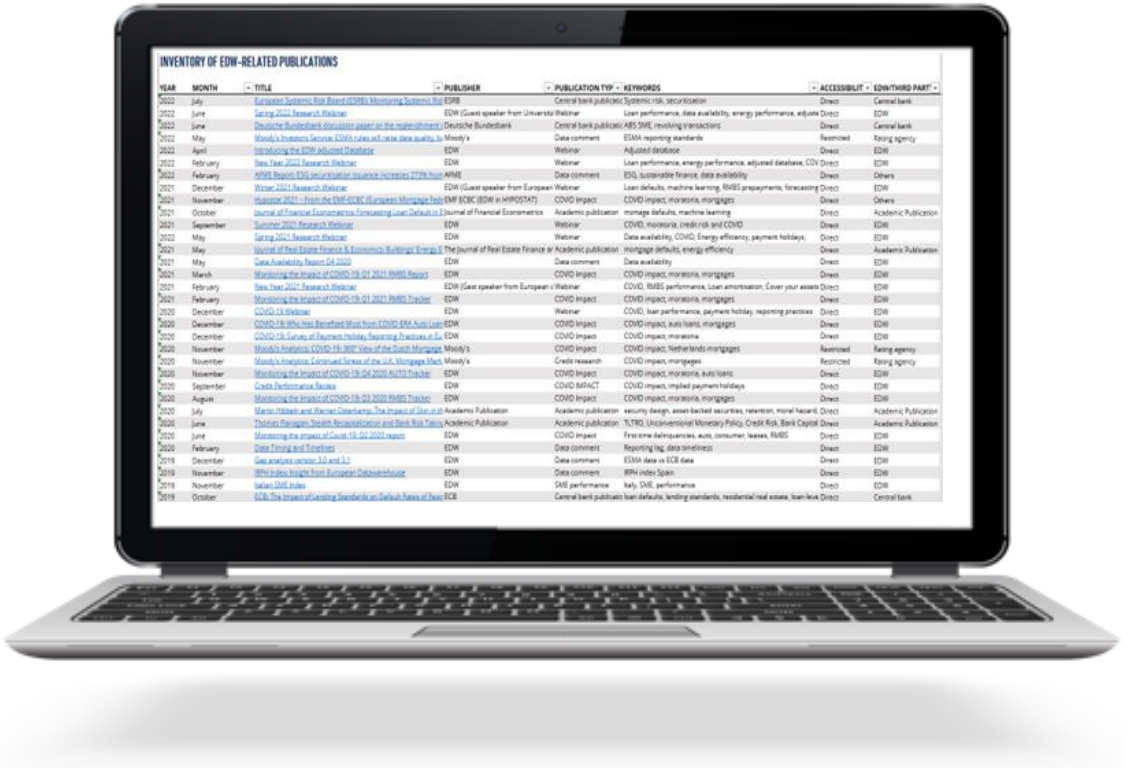


https://eurodw.eu/knowledge/magazine//

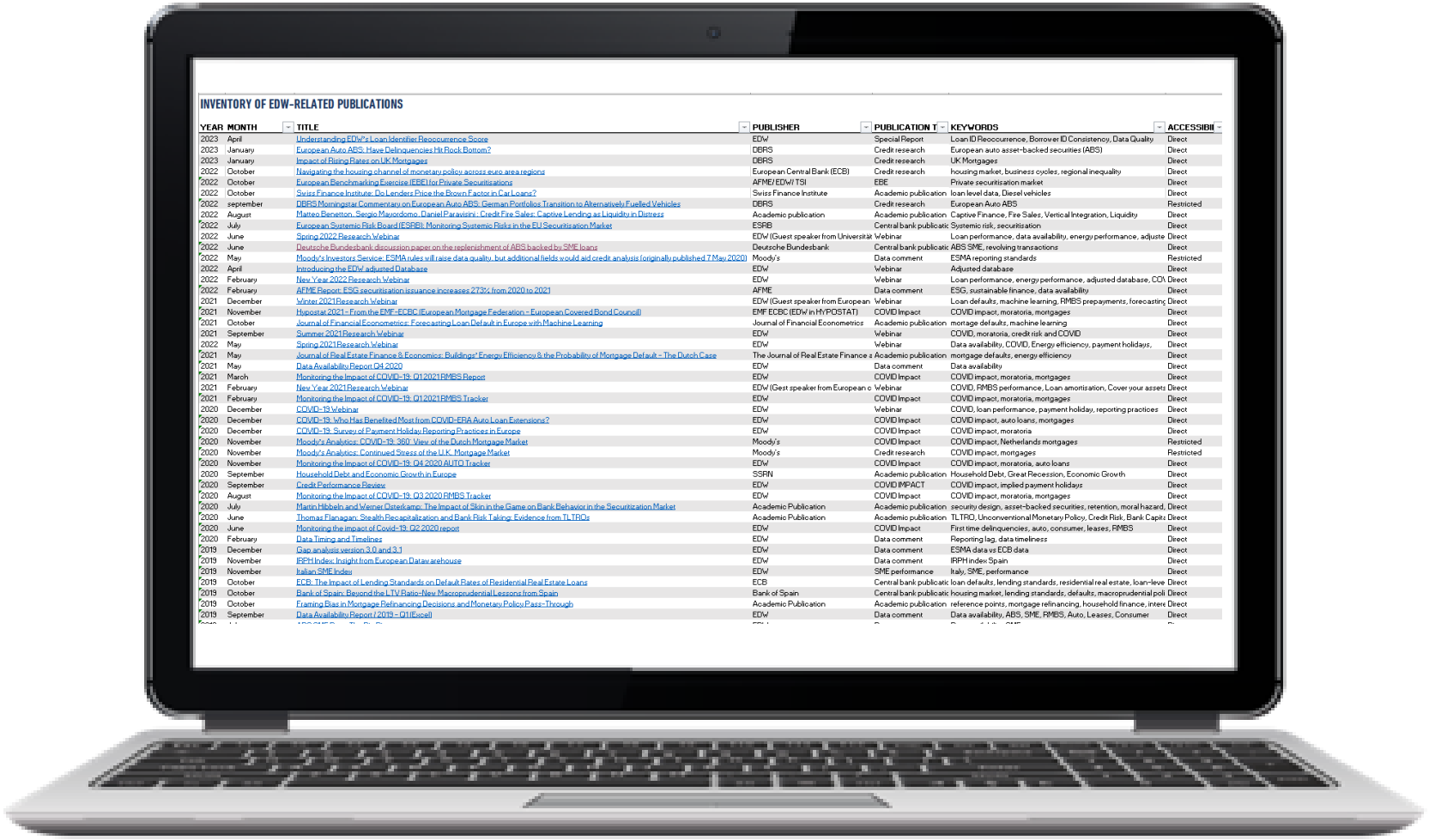
LIST OF RESEARCH PUBLICATIONS

Our own publications, plus third-party research Media Library - European DataWarehouse (eurodw.eu)





https://eurodw.eu/about-us/media-library/



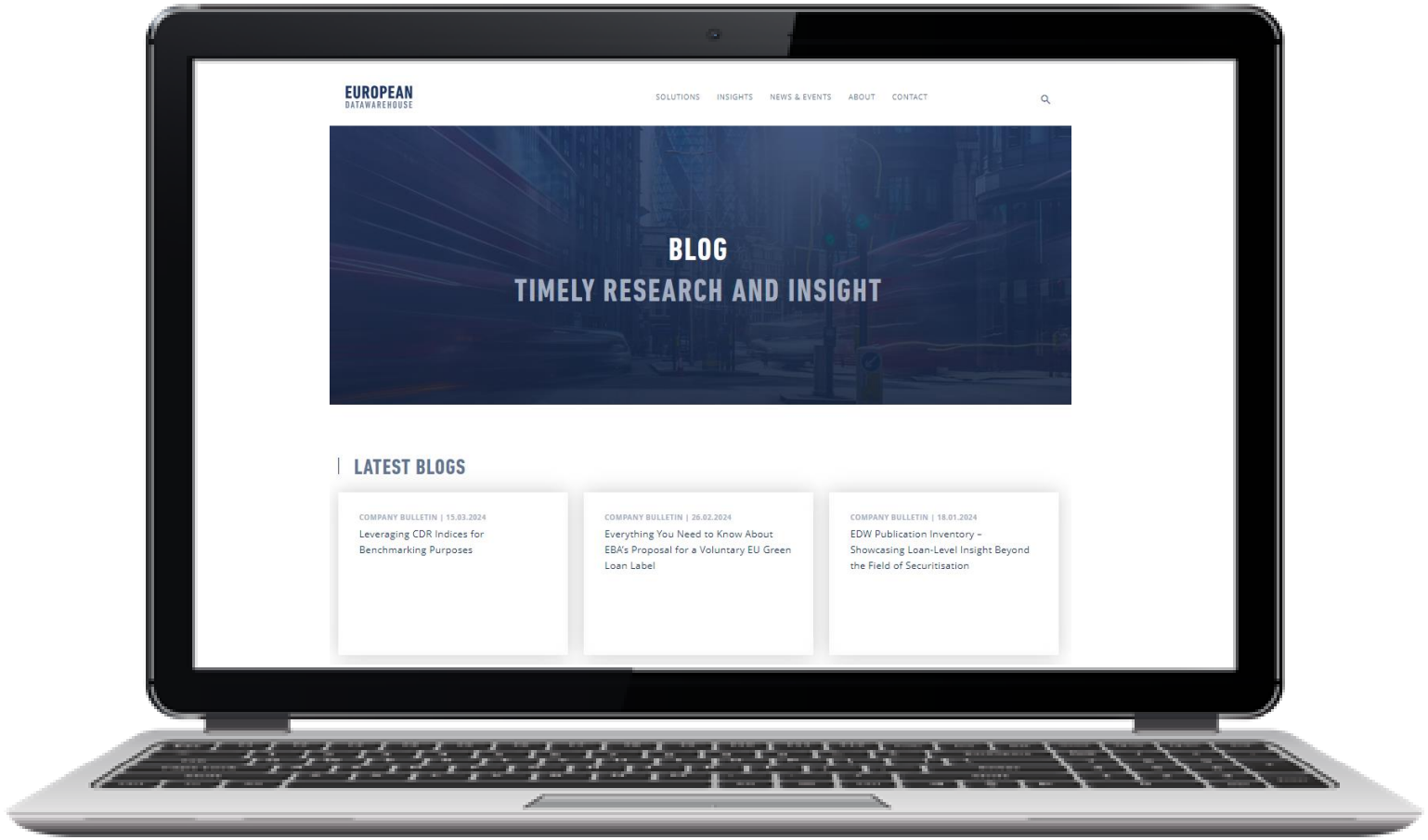
INVENTORY OF EDW-RELATED PUBLICATIONS

YEAR	MONTH	TITLE	PUBLISHER	PUBLICATION T	KEYWORDS	ACCESSIBI
2023	April	Understanding EDW's Loan Identifier Reoccurrence Score	EDW	Special Report	Loan ID Reoccurrence, Borrower ID Consistency, Data Quality	Direct
2023	January	European Auto ABS: Have Delinquencies Hit Rock Bottom?	DBRS	Credit research	European auto asset-backed securities (ABS)	Direct
2023	January	Impact of Rising Rates on UK Mortgages	DBRS	Credit research	UK Mortgages	Direct
2022	October	Navigating the housing channel of monetary policy across euro area regions	European Central Bank (ECB)	Credit research	housing market, business cycles, regional inequality	Direct
2022	October	European Benchmarking Exercise (EBE) for Private Securitisations	AFME/EDW TSI	EBE	Private securitisation market	Direct
2022	October	Swiss Finance Institute: Do Lenders Price the Brown Factor in Car Loans?	Swiss Finance Institute	Academic publication	loan level data, Diesel vehicles	Direct
2022	september	DBRS Morningstar Commentary on European Auto ABS: German Portfolios Transition to Alternatively Fuelled Vehicles	DBRS	Credit research	European Auto ABS	Restricted
2022	August	Matteo Benetton, Sergio Mayordomo, Daniel Paravisini - Credit Fire Sales: Captive Lending as Liquidity in Distress	Academic publication	Academic publication	Captive Finance, Fire Sales, Vertical Integration, Liquidity	Direct
2022	July	European Systemic Risk Board (ESRB): Monitoring Systemic Risks in the EU Securitisation Market	ESRB	Central bank publicatic	Systemic risk, securitisation	Direct
2022	June	Spring 2022 Research Webinar	EDW (Guest speaker from Universitat	Webinar	Loan performance, data availability, energy performance, adjuste	Direct
2022	June	Deutsche Bundesbank discussion paper on the replenishment of ABS backed by SME loans	Deutsche Bundesbank	Central bank publicatic	ABS SME, revolving transactions	Direct
2022	May	Moody's Investors Service: ESMA rules will raise data quality, but additional fields would aid credit analysis (originally published 7 May 2020)	Moody's	Data comment	ESMA reporting standards	Restricted
2022	April	Introducing the EDW adjusted Database	EDW	Webinar	Adjusted database	Direct
2022	February	New Year 2022 Research Webinar	EDW	Webinar	Loan performance, energy performance, adjusted database, CO\	Direct
2022	February	AFME Report: ESG securitisation issuance increases 273% from 2020 to 2021	AFME	Data comment	ESG, sustainable finance, data availability	Direct
2021	December	Winter 2021 Research Webinar	EDW (Guest speaker from European	Webinar	Loan defaults, machine learning, RMBS prepayments, forecasting	Direct
2021	November	Hipostat 2021 - From the EMF-ECBC (European Mortgage Federation - European Covered Bond Council)	EMF ECBC (EDW in HYPOSTAT)	COVID Impact	COVID impact, moratoria, mortgages	Direct
2021	October	Journal of Financial Econometrics: Forecasting Loan Default in Europe with Machine Learning	Journal of Financial Econometrics	Academic publication	mortage defaults, machine learning	Direct
2021	September	Summer 2021 Research Webinar	EDW	Webinar	COVID, moratoria, credit risk and COVID	Direct
2022	May	Spring 2021 Research Webinar	EDW	Webinar	Data availability, COVID, Energy efficiency, payment holidays,	Direct
2021	May	Journal of Real Estate Finance & Economics: Buildings' Energy Efficiency & the Probability of Mortgage Default - The Dutch Case	The Journal of Real Estate Finance a	Academic publication	mortgage defaults, energy efficiency	Direct
2021	May	Data Availability Report Q4 2020	EDW	Data comment	Data availability	Direct
2021	March	Monitoring the Impact of COVID-19: Q1 2021 RMBS Report	EDW	COVID Impact	COVID impact, moratoria, mortgages	Direct
2021	February	New Year 2021 Research Webinar	EDW (Gest speaker from European c	Webinar	COVID, RMBS performance, Loan amortisation, Cover your assets	Direct
2021	February	Monitoring the Impact of COVID-19: Q1 2021 RMBS Tracker	EDW	COVID Impact	COVID impact, moratoria, mortgages	Direct
2020	December	COVID-19 Webinar	EDW	Webinar	COVID, loan performance, payment holiday, reporting practices	Direct
2020	December	COVID-19: Who Has Benefited Most from COVID-EPA Auto Loan Extensions?	EDW	COVID Impact	COVID impact, auto loans, mortgages	Direct
2020	December	COVID-19: Survey of Payment Holiday Reporting Practices in Europe	EDW	COVID Impact	COVID impact, moratoria	Direct
2020	November	Moody's Analytics: COVID-19: 360° View of the Dutch Mortgage Market	Moody's	COVID Impact	COVID impact, Netherlands mortgages	Restricted
2020	November	Moody's Analytics: Continued Stress of the U.K. Mortgage Market	Moody's	Credit research	COVID impact, mortgages	Restricted
2020	November	Monitoring the Impact of COVID-19: Q4 2020 AUTO Tracker	EDW	COVID Impact	COVID impact, moratoria, auto loans	Direct
2020	September	Household Debt and Economic Growth in Europe	SSRN	Academic publication	Household Debt, Great Recession, Economic Growth	Direct
2020	September	Credit Performance Review	EDW	COVID IMPACT	COVID impact, implied payment holidays	Direct
2020	August	Monitoring the Impact of COVID-19: Q3 2020 RMBS Tracker	EDW	COVID Impact	COVID impact, moratoria, mortgages	Direct
2020	July	Martin Hibbeln and Werner Osterkamp: The Impact of Skin in the Game on Bank Behavior in the Securitization Market	Academic Publication	Academic publication	security design, asset-backed securities, retention, moral hazard,	Direct
2020	June	Thomas Flanagan: Stealth Recapitalization and Bank Risk Taking: Evidence from TLTROs	Academic Publication	Academic publication	TLTRO, Unconventional Monetary Policy, Credit Risk, Bank Capita	Direct
2020	June	Monitoring the impact of Covid-19: Q2 2020 report	EDW	COVID Impact	First time delinquencies, auto, consumer, leases, RMBS	Direct
2020	February	Data Timing and Timelines	EDW	Data comment	Reporting lag, data timelinesss	Direct
2019	December	Gap analysis version 3.0 and 3.1	EDW	Data comment	ESMA data vs ECB data	Direct
2019	November	IRPH Index: Insight from European Datawarehouse	EDW	Data comment	IRPH index Spain	Direct
2019	November	Italian SME Index	EDW	SME performance	Italy, SME, performance	Direct
2019	October	ECB: The Impact of Lending Standards on Default Rates of Residential Real Estate Loans	ECB	Central bank publicatic	loan defaults, lending standards, residential real estate, loan-leve	Direct
2019	October	Bank of Spain: Beyond the LTV Ratio-New Macroprudential Lessons from Spain	Bank of Spain	Central bank publicatic	housing market, lending standards, defaults, macroprudential poli	Direct
2019	October	Framing Bias in Mortgage Refinancing Decisions and Monetary Policy Pass-Through	Academic Publication	Academic publication	reference points, mortgage refinancing, household finance, intere	Direct
2019	September	Data Availability Report (2019 - Q1) Excel	EDW	Data comment	Data availability, ABS, SME, RMBS, Auto, Leases, Consumer	Direct

Excel Available in our Media Library Section

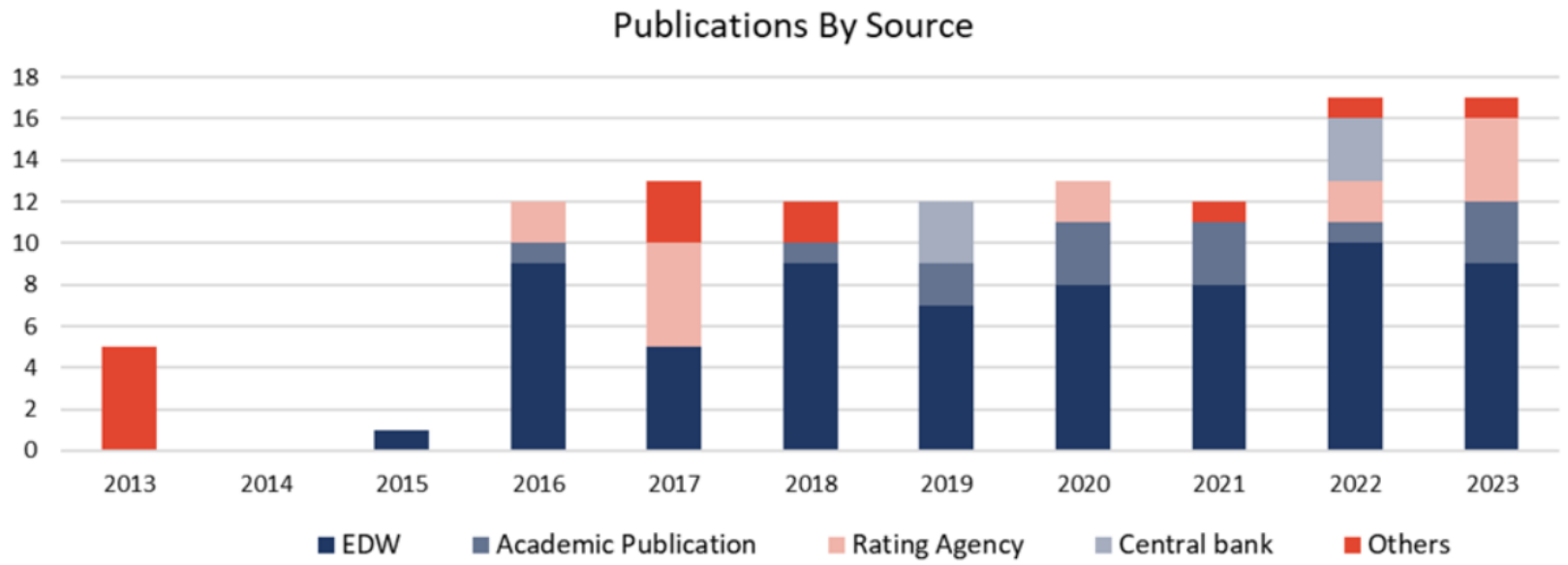
BLOG

Short articles on current topics https://eurodw.eu/knowledge/magazine//



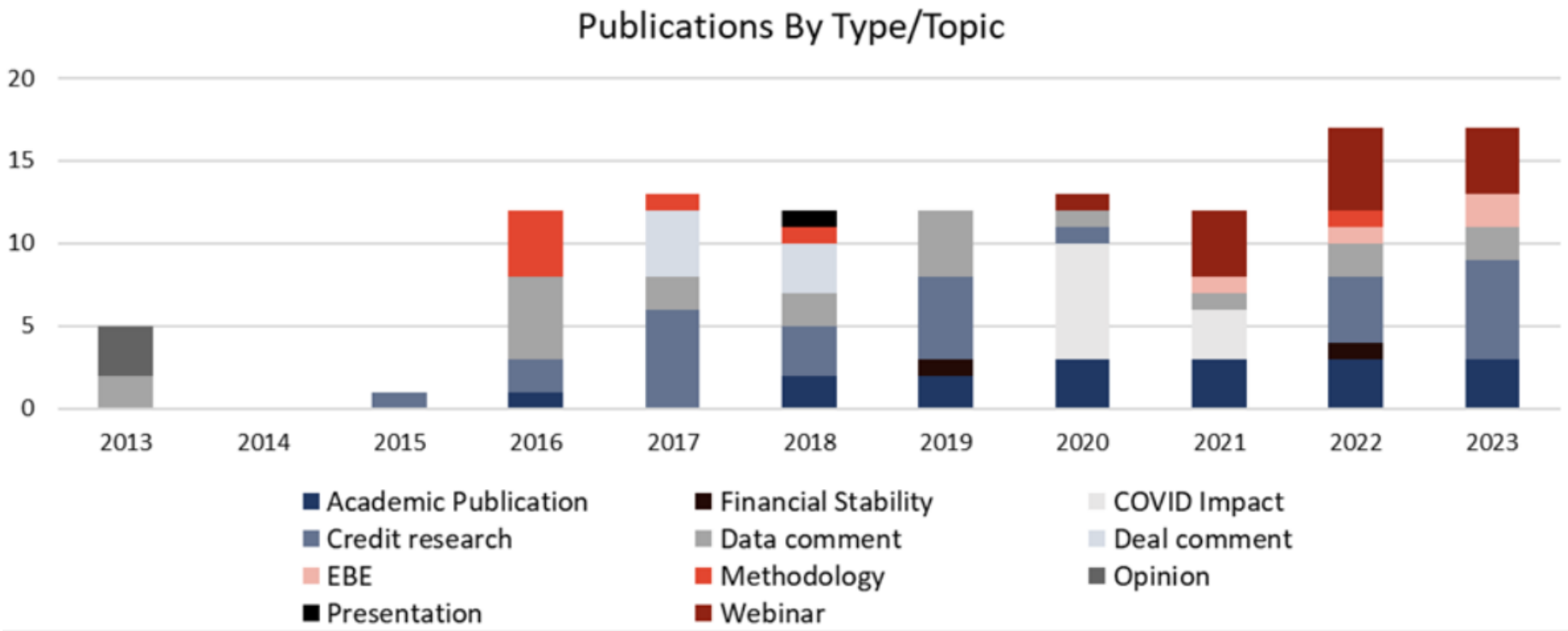
BLOG ON PUBLICATIONS INVENTORY (1)

EDW Publication Inventory – Showcasing Loan-Level Insight Beyond the Field of Securitisation – European DataWarehouse (eurodw.eu)



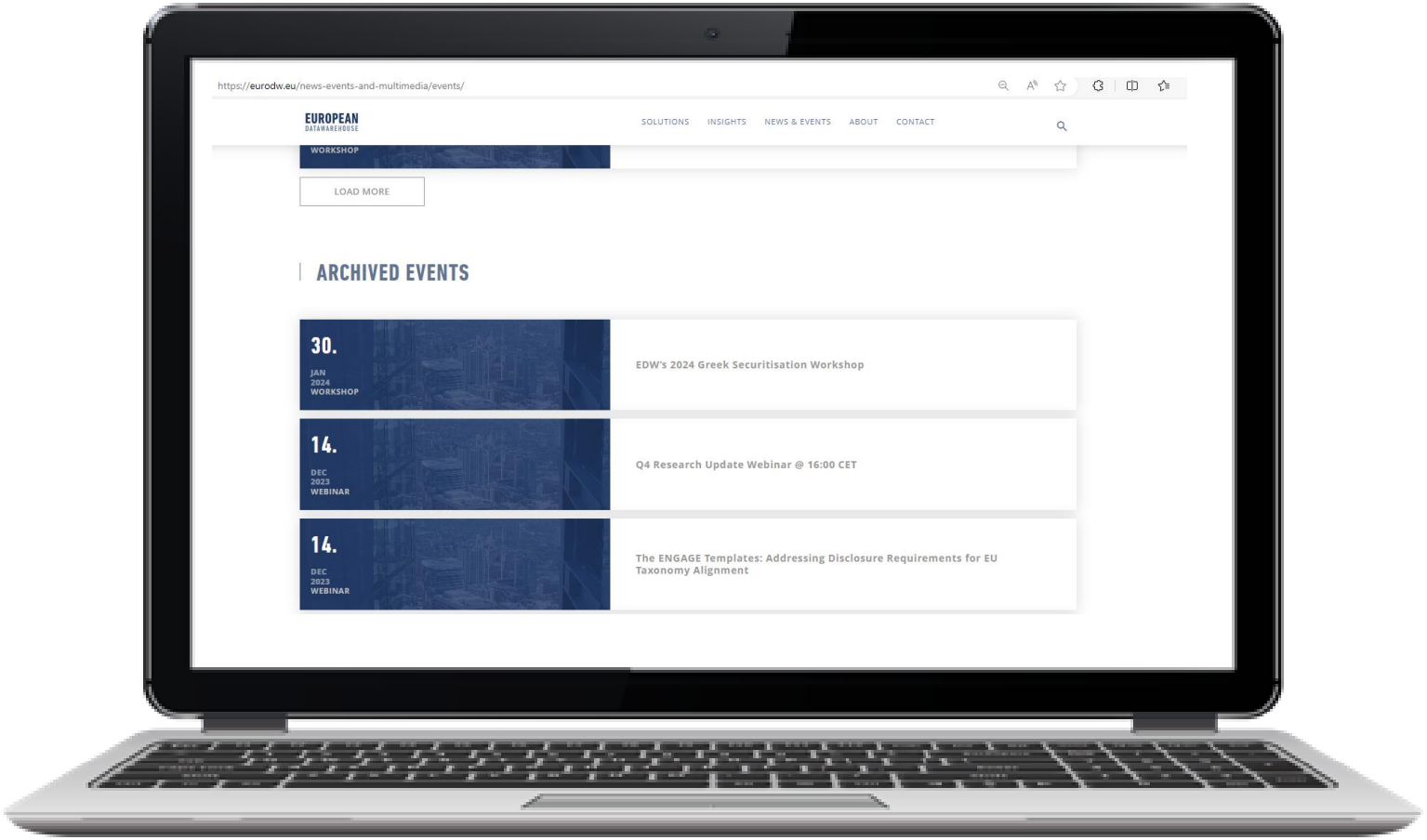
BLOG ON PUBLICATIONS INVENTORY (2)

EDW Publication Inventory – Showcasing Loan-Level Insight Beyond the Field of Securitisation – European DataWarehouse (eurodw.eu)



WEBINARS

The slides and recordings of our webinars https://eurodw.eu/news-events-and-multimedia/events/

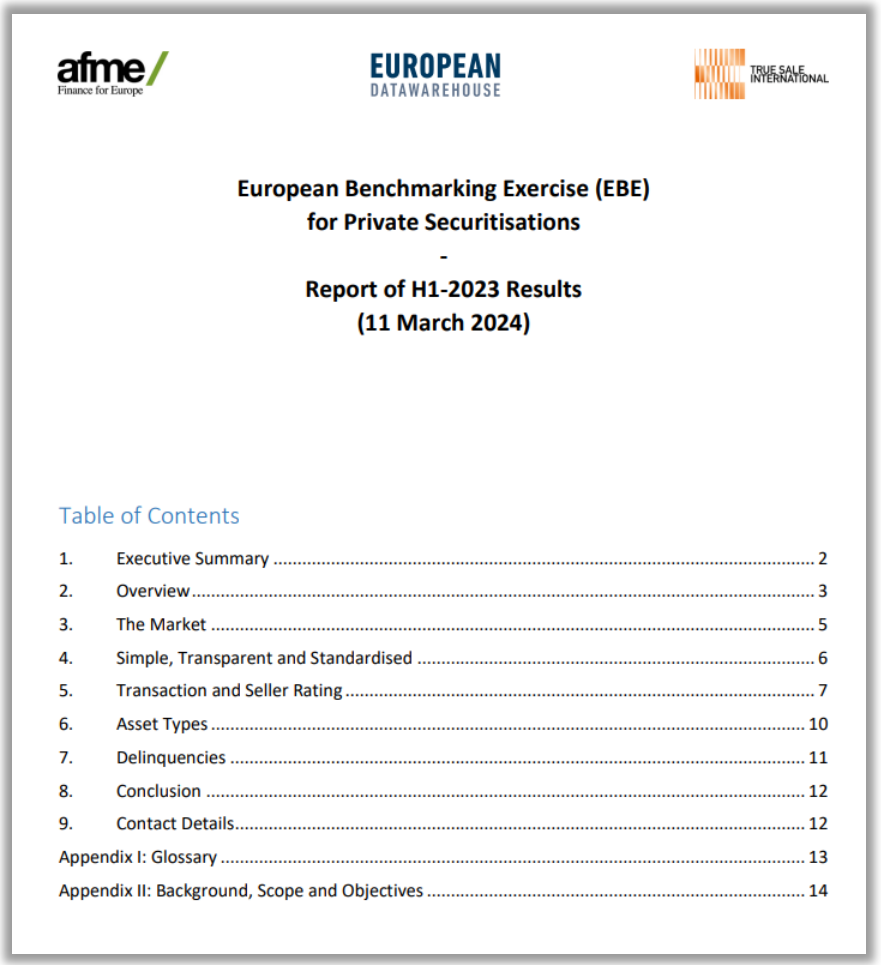


EUROPEAN BENCHMARKING EXERCISE (EBE – REPORT ON PRIVATE DEALS)

EUROPEAN BENCHMARKING EXERCISE – UPDATED REPORT ON PRIVATE DEALS

The 5th update of the European Benchmarking Exercise is a joint publication from AFME, TSI and EDW

EBE_2023-H1_Report_20240311.pdf (eurodw.eu)



afme/ Finance for Europe

EUROPEAN DATAWAREHOUSE

TRUE SALE INTERNATIONAL

European Benchmarking Exercise (EBE)
for Private Securitisations
-
Report of H1-2023 Results
(11 March 2024)

Table of Contents

EBE HIGHLIGHTS – UPDATED REPORT ON PRIVATE DEALS (1)

		2023-06	2022-12	2022-06	2021-12	2021-06	Δ_P	Δ
Number of Participants	#	12	12	12	12	12	0.0%	0.0%
Number of Commitments	#	610	556	525	527	504	9.7%	10.5%
Committed Amount	Million EUR	78,590	73,182	67,241	65,064	62,814	7.4%	12.6%
Funded Amount	Million EUR	57,748	60,502	56,400	53,009	50,205	-4.6%	7.5%
Utilisation		73.5%	82.7%	83.9%	81.5%	80.0%	-11.1%	-4.1%
Total Asset Amount	Million EUR	184,765	184,159	183,326	173,016	177,329	0.3%	2.1%
Estimated Market Size	Million EUR	209,400	195,669	194,784	183,830	188,412	7.0%	5.6%
Number of Transactions	#	443	433	412	387	404	2.3%	4.8%

Δ=annualised growth rate, ΔP=growth in last period

EBE HIGHLIGHTS – UPDATED REPORT ON PRIVATE DEALS (2)

	Committed Amount						
Funding Type	2023-06	2022-12	2022-06	2021-12	2021-06	Δ_P	Δ
ABCP	69,635	65,235	59,412	57,491	55,524	7%	13%
BS	8,954	7,947	7,829	7,573	7,291	13%	11%
Total	**78,590**	**73,182**	**67,241**	**65,064**	**62,814**	7%	13%

Δ=annualised growth rate, Δ_P=growth in last period

	Committed Amount						
Asset Type	2023-06	2022-12	2022-06	2021-12	2021-06	Δ_P	Δ
Trade Receivables	47,505	42,523	40,682	38,966	35,689	12%	17%
Auto Loan or Leasing	11,023	11,132	10,162	11,187	13,985	-1%	-11%
Equipment Leasing	4,830	5,096	4,327	4,183	3,417	-5%	21%
Consumer Loans	5,115	4,891	4,704	3,760	3,197	5%	30%
Diverse	10,117	9,540	7,366	6,968	6,527	6%	28%
Total	**78,590**	**73,182**	**67,241**	**65,064**	**62,815**	7%	13%

Δ=annualised growth rate

EBE HIGHLIGHTS – UPDATED REPORT ON PRIVATE DEALS (3)

Seller Rating Share	2023-06	2022-12	2022-06	2021-12	2021-06	Δ_p	Δ
AAA	1.4%	1.1%	1.3%	1.3%	2.7%	24%	-24%
AA	0.5%	0.6%	0.0%	0.0%	1.3%	-9%	-30%
A	9.6%	7.5%	7.4%	6.5%	16.3%	28%	-21%
BBB	37.2%	41.8%	41.2%	40.6%	43.0%	-11%	-7%
BB and lower	18.2%	17.2%	20.7%	20.4%	22.8%	6%	-10%
NR	13.2%	13.7%	11.0%	10.6%	8.3%	-4%	30%
ND	19.9%	18.1%	18.3%	20.5%	5.6%	10%	128%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**		

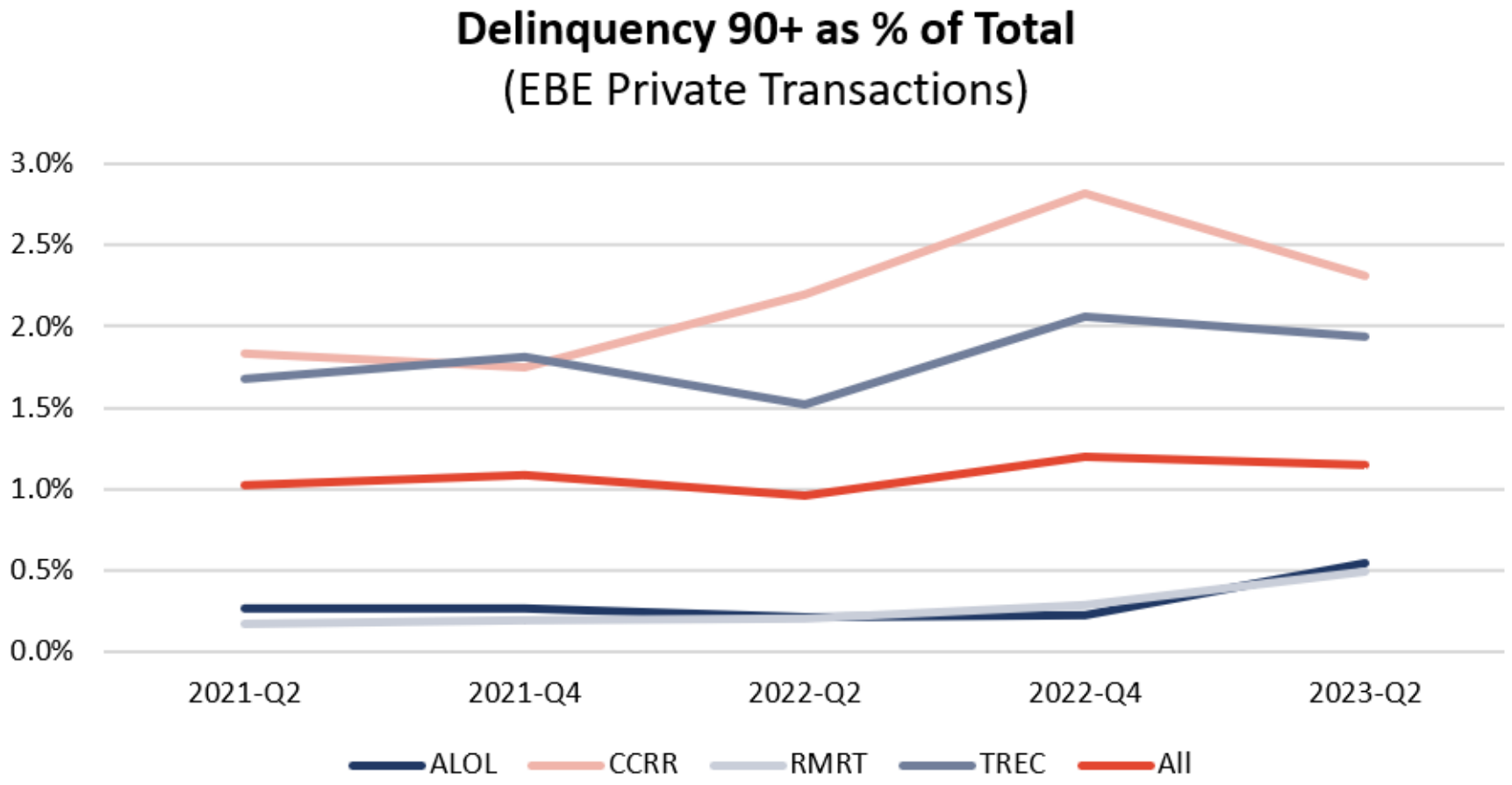
Δ=annualised growth rate

Transaction Rating Share	2023-06	2022-12	2022-06	2021-12	2021-06	Δ_p	Δ
AAA	29.0%	22.3%	22.6%	22.4%	20.2%	30%	22%
AA	34.0%	35.2%	39.8%	38.8%	34.3%	-3%	0%
A	19.6%	25.9%	21.9%	23.9%	21.0%	-24%	-3%
BBB	12.3%	11.4%	11.1%	10.0%	9.6%	8%	14%
BB and lower	0.3%	0.4%	0.5%	0.4%	0.5%	-19%	-18%
NR	4.6%	4.7%	3.9%	4.1%	13.1%	-3%	-32%
ND	0.1%	0.1%	0.1%	0.5%	1.3%	-7%	-45%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**		

Δ=annualised growth rate

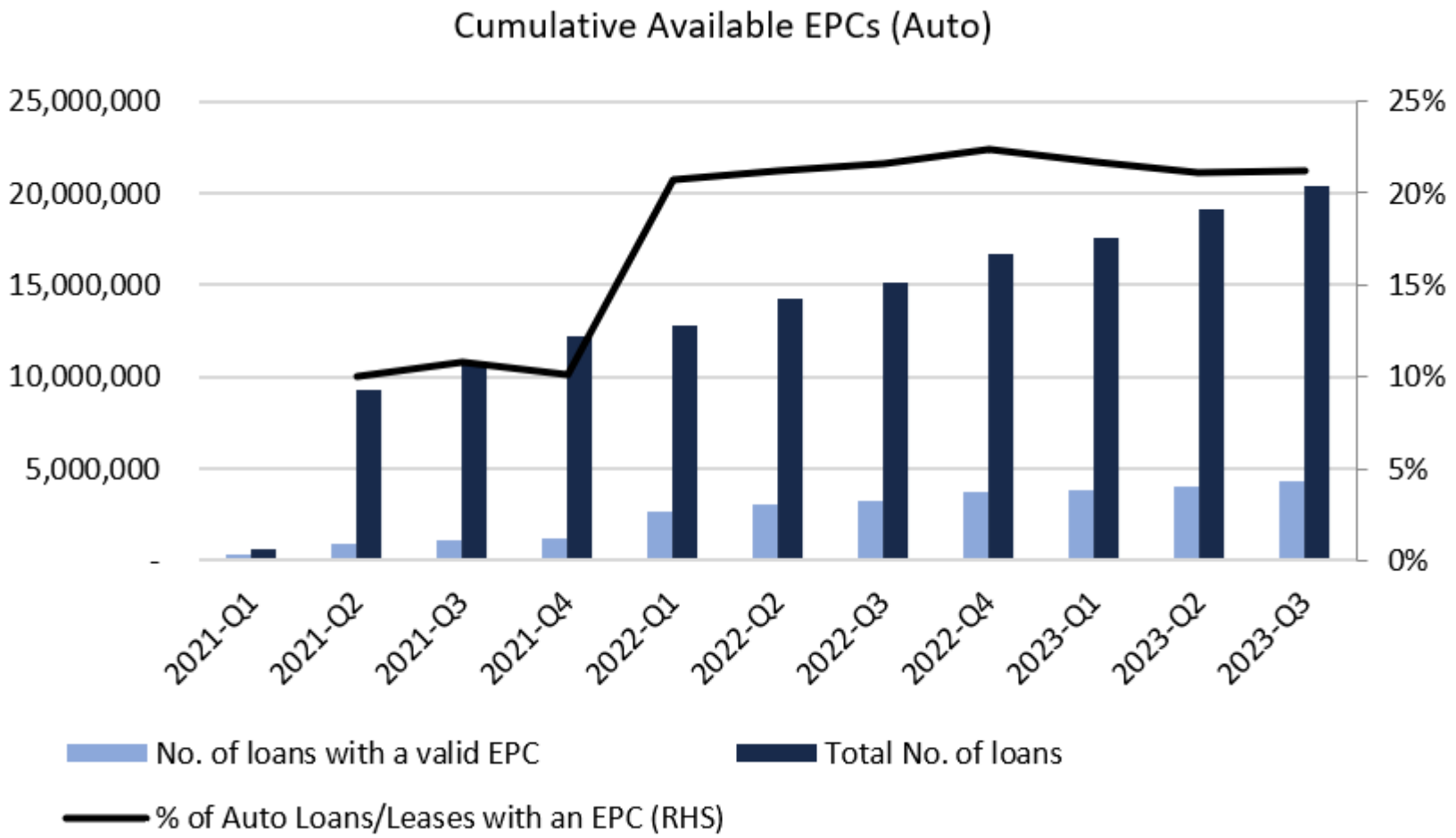
EUROPEAN BENCHMARKING EXERCISE

Delinquency 90+ Private securitisations

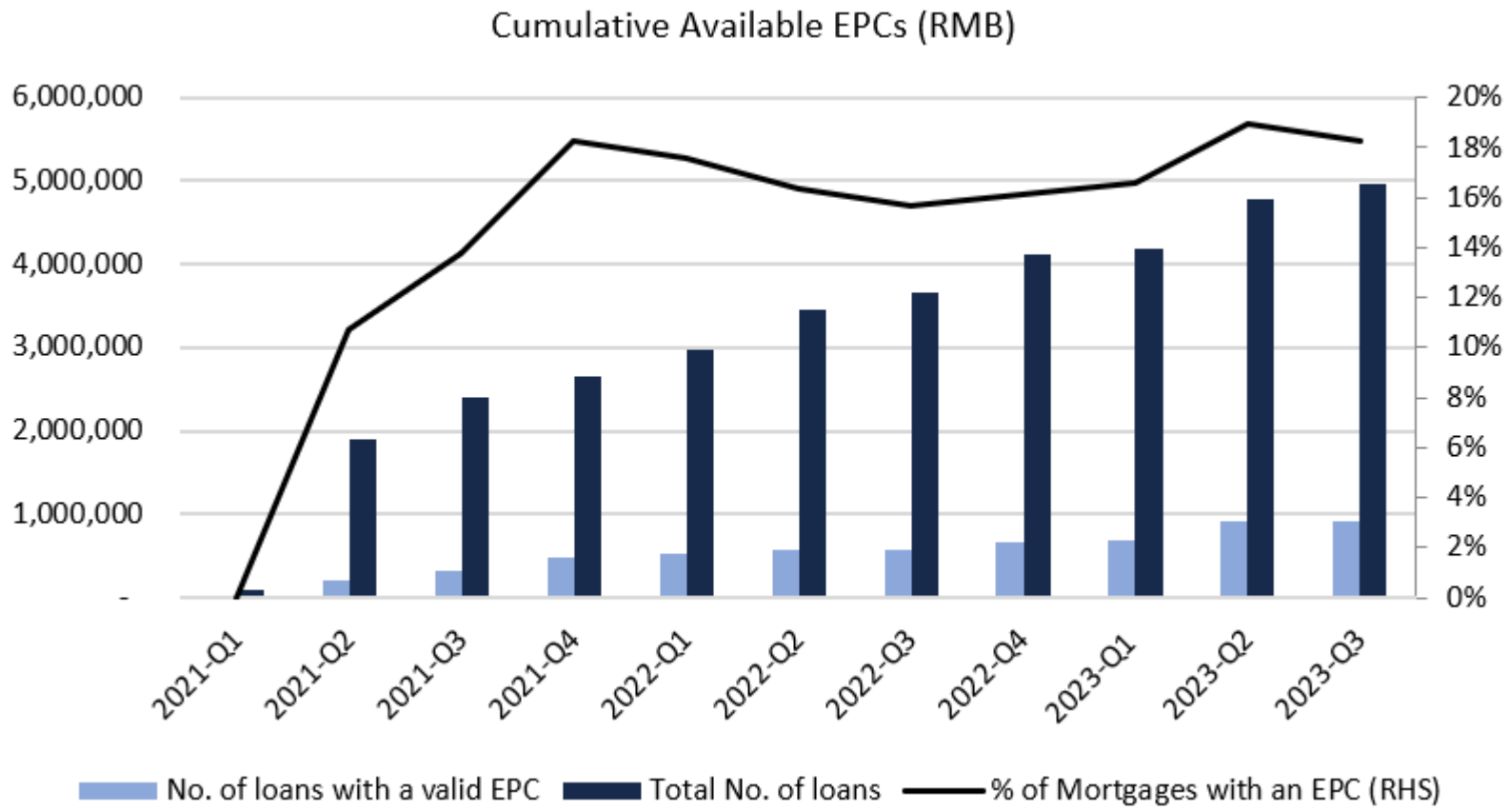


EPC DATA AVAILABILITY

ENERGY PERFORMANCE CERTIFICATES (AUTO)



ENERGY PERFORMANCE CERTIFICATES (RMB)



ROLL RATES

ARREARS, ROLL RATES, DEFAULTS… (1)

Not all loans in arrears default

- At closing date, there are typically no loans in arrears
- When the default definition is long (12 months), it takes 12 months before the first default appears

	Total Outstanding	1 MONTH	2 MONTHS	3 MONTHS	4 MONTHS	5 MONTHS	6 MONTHS	7 MONTHS	8 MONTHS	9 MONTHS	10 MONTHS	11 MONTHS	NEW DEFAULTS
Nov 04	2,000,000,000	-	-	-	-	-	-	-	-	-	-	-	-
Dec 04	1,983,726,769	10,374,225	-	-	-	-	-	-	-	-	-	-	-
Jan 05	1,941,915,792	53,680,413	8,461,985	-	-	-	-	-	-	-	-	-	-
Feb 05	1,901,143,725	61,211,220	14,850,230	2,142,746	-	-	-	-	-	-	-	-	-
Mar 05	1,853,723,395	50,246,001	17,809,303	3,643,888	448,502	-	-	-	-	-	-	-	-
Apr 05	1,814,975,416	78,897,978	16,073,874	8,413,368	786,146	447,107	-	-	-	-	-	-	-
May 05	1,775,472,493	48,804,939	16,718,538	6,282,342	2,517,910	777,771	-	-	-	-	-	-	-
Jun 05	1,720,526,983	43,512,905	17,053,445	9,067,283	826,429	2,051,700	440,911	-	-	-	-	-	-
Jul 05	1,684,147,770	78,806,188	15,183,110	9,539,752	2,632,264	694,532	2,050,471	440,911	-	-	-	-	-
Aug 05	1,645,663,042	50,146,247	17,760,633	10,252,614	1,365,626	2,632,264	694,532	281,288	440,911	-	-	-	-
Sep 05	1,615,379,131	35,066,686	19,202,705	7,439,832	274,912	636,867	2,632,264	262,933	250,107	440,911	-	-	-
Oct 05	1,579,252,948	33,124,282	15,998,015	11,406,261	411,401	274,912	636,867	35,000	262,933	250,107	440,911	-	-
Nov 05	1,540,464,861	41,633,493	14,209,397	10,331,856	571,413	357,565	274,912	429,888	35,000	262,933	250,107	440,911	-
Dec 05	1,498,435,425	36,714,952	21,252,882	8,938,903	514,391	235,762	357,565	274,912	429,888	35,000	76,451	250,107	440,911
Jan 06	1,460,024,467	40,709,018	21,303,560	8,811,306	1,206,676	268,028	235,762	278,905	234,979	416,106	35,000	76,451	250,107
Feb 06	1,424,889,174	46,341,873	7,848,547	14,338,065	5,524,622	941,946	83,538	235,762	278,905	234,979	415,976	35,000	76,451
Mar 06	1,365,652,894	30,698,301	13,469,346	10,450,314	4,918,877	1,058,949	656,017	48,866	235,762	278,905	234,979	415,976	35,000
Apr 06	1,330,494,119	46,220,375	17,871,038	10,121,347	317,261	2,028,170	685,516	542,182	48,866	52,847	278,905	234,979	415,976

Source: Intermoney Securitisation (Performance report for IM BANCO POPULAR FTPYME I

ARREARS, ROLL RATES, DEFAULTS… (3)

Not all loans in arrears do default

- Until 4 months in arrears, not all loans roll into the next delinquency bucket
- Overall, EUR53.8M defaulted out of 2 BN = 2.7% Cumulative default rate
- Moody's cumulative default assumption when rating the deal originally was 2.5%…

	Total Outstanding	1 MONTH	2 MONTHS	3 MONTHS	4 MONTHS	5 MONTHS	6 MONTHS	7 MONTHS	8 MONTHS	9 MONTHS	10 MONTHS	11 MONTHS	NEW DEFAULTS
Nov 04	2,000,000,000	-	-	-	-	-	-	-	-	-	-	-	-
Dec 04	1,983,726,769	10,	-	-	-	-	-	-	-	-	-	-	-
Jan 05	1,941,915,792	53,680,413	8,4	-	-	-	-	-	-	-	-	-	-
Feb 05	1,901,143,725	61,[illegible]11,220	[illegible]14,8	[illegible]2,14	-	-	-	-	-	-	-	-	-
Mar 05	1,853,723,395	50,246,001	17,8[illegible]9,303	3,64[illegible]	[illegible]48	-	-	-	-	-	-	-	-
Apr 05	1,814,975,416	78,897,978	16,073,874	8,413,[illegible]68	786[illegible]	[illegible]47,107	-	-	-	-	-	-	-
May 05	1,775,472,493	48,804,939	16,718,538	6,28[illegible],342	2,[illegible]17,9[illegible]0	777[illegible]	-	-	-	-	-	-	-
Jun 05	1,720,526,983	43,512,905	17,053,445	9,067,283	82[illegible],429	2,[illegible]051,7[illegible]0	440[illegible]	-	-	-	-	-	-
Jul 05	1,684,147,770	78,806,188	15,183,110	9,539,752	2,632,264	694,[illegible]32	2,[illegible]050,4[illegible]1	440,911	-	-	-	-	-
Aug 05	1,645,663,042	50,146,247	17,760,633	10,252,614	1,365,626	2,632,264	694,532	281,288	440,911	-	-	-	-
Sep 05	1,615,379,131	35,066,686	19,202,705	7,439,832	274,912	636,867	2,632,264	262,933	250,107	440,911	-	-	-
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Dec 05	1,498,435,425	36,714,952	21,252,882	8,938,903	514,391	235,762	357,565	274,912	429,888	35,000	76,451	250,107	40,911
Jan 06	1,460,024,467	40,709,018	21,303,560	8,811,306	1,206,676	268,028	235,762	278,905	234,979	416,106	35,000	76,451	[illegible]107
Feb 06	1,424,889,174	46,341,873	7,848,547	14,338,065	5,524,622	941,946	83,538	235,762	278,905	234,979	415,976	35,000	76,451
Mar 06	1,365,652,894	30,698,301	13,469,346	10,450,314	4,918,877	1,058,949	656,017	48,866	235,762	278,905	234,979	415,976	35,000
Apr 06	1,330,494,119	46,220,375	17,871,038	10,121,347	317,261	2,028,170	685,516	542,182	48,866	52,847	278,905	234,979	415,976

21% 54% 29% 100% 100% 1.3% 100%

Source: Intermoney Securitisation (Performance report for IM BANCO POPULAR FTPYME I)

ARREARS, ROLL RATES, DEFAULTS… (4)

When quarterly data is available instead of monthly data…

	Total Outstanding	1 MONTH	2 MONTHS	3 MONTHS	4 MONTHS	5 MONTHS	6 MONTHS	7 MONTHS	8 MONTHS	9 MONTHS	10 MONTHS	11 MONTHS	NEW DEFAULTS
Nov 04	2,000,000,000	-	-	-	-	-	-	-	-	-	-	-	-
Dec 04	1,983,726,769	10,374,225	-	-	-	-	-	-	-	-	-	-	-
Jan 05	1,941,915,792	53,680,4	8,461,[illegible]		-	-	-	-	-	-	-	-	-
Feb 05	1,901,143,725	61,21[illegible]0	14,850[illegible]	[illegible],746	-	-	-	-	-	-	-	-	-
Mar 05	1,853,723,395	50,246,001	17,809,303	3,643,888	[illegible]48,502		-	-	-	-	-	-	-
Apr 05	1,814,975,416	78,897,978	16,073,874	8,413,368	[illegible]36,146	[illegible]47,107		-	-	-	-	-	-
May 05	1,775,472,493	48,804,939	16,718,538	6,282,342	[illegible]17,91[illegible]	777,[illegible]	-	-	-	-	-	-	-
Jun 05	1,720,526,983	43,512,905	17,053,445	9,067,283	826,42[illegible]	2,051,[illegible]	[illegible],911	-	-	-	-	-	-
Jul 05	1,684,147,770	78,806,188	15,183,110	9,539,752	2,632,264	694,532	2,050,471	[illegible]0,911	-	-	-	-	-
Aug 05	1,645,663,042	50,146,247	17,760,633	10,252,614	1,365,626	2,632,264	694,532	[illegible],288	440,911	-	-	-	-
Sep 05	1,615,379,131	35,066,686	19,202,705	7,439,832	274,912	636,867	2,632,264	262,93[illegible]	250,107	[illegible]	-	-	-
Oct 05	1,579,252,948	33,124,282	15,998,015	11,406,261	411,401	274,912	636,867	35,000	262,933	250,107	[illegible]911	-	-
Nov 05	1,540,464,861	41,633,493	14,209,397	10,331,856	571,413	357,565	274,912	429,888	35,000	262,933	[illegible]07	440,911	-
Dec 05	1,498,435,425	36,714,952	21,252,882	8,938,903	514,391	235,762	357,565	274,912	429,888	35,000	76,451	250,107	440,911
Jan 06	1,460,024,467	40,709,018	21,303,560	8,811,306	1,206,676	268,028	235,762	278,905	234,979	416,106	35,000	76,451	250,107
Feb 06	1,424,889,174	46,341,873	7,848,547	14,338,065	5,524,622	941,946	83,538	235,762	278,905	234,979	415,976	35,000	76,451
Mar 06	1,365,652,894	30,698,301	13,469,346	10,450,314	4,918,877	1,058,949	656,017	48,866	235,762	278,905	234,979	415,976	35,000
Apr 06	1,330,494,119	46,220,375	17,871,038	10,121,347	317,261	2,028,170	685,516	542,182	48,866	52,847	278,905	234,979	415,976

3.3%

1.3%

100%

Source: Intermoney Securitisation (Performance report for IM BANCO POPULAR FTPYME I

WITH LOAN LEVEL DATA...

New possibilities

- You can also calculate the roll rate for a subset of loans
- You can also make a „transition matrix“ to see what happens to loans in arrears from one period to the next
- Some loans in arrears roll backwards from one delinquency bucket into the preceding bucket
- The latter phenomenon is not observable using only investor reports but can be studied with loan-level data

TRANSITION MATRIX

Comparing days in arrears + loan status Nov. 2023 to Dec 2023

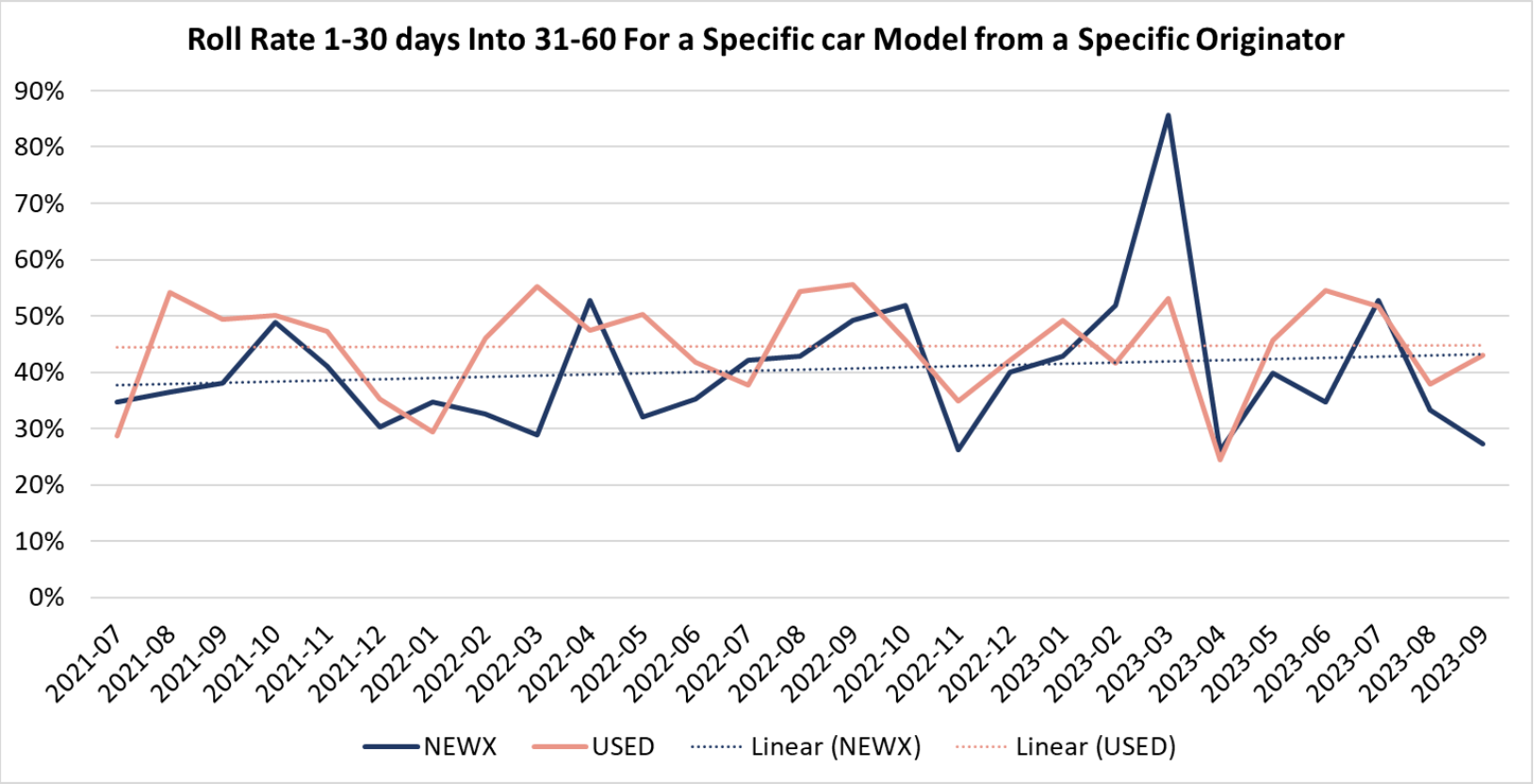
- In the transition matrix, we focus on a large auto deal
- Left-hand side: Nov. 2023 loan status; top: Dec 2023 loan status
- Out of 436 loans that were 0-30 days in arrears in Nov., in Dec., 142 are 30-60 days in arrears,156 are back to performing, 97 are still in the same delinquency bucket…
- Also:
  - 82 loans seem to go directly from zero arrears to default…
  - But in this specific case, loans tend to either roll into the next bucket or reperform

		Dec. 2023															
			0 - 30		30 - 60		60 - 90		90 - 120		120 +		zero		zero		
		zero - PERF	ARRE	RARR	ARRE	RARR	ARRE	RARR	ARRE	RARR	ARRE	RARR	ARRE	DFLT	RARR	RDMD	Total
	zero	381,988	837	114	474	19	21	2	8	3	12	8	14	82	1	8,174	391,757
	0-30	156	97	-	142	-	1	-	-	-	-	-	-	1	-	39	436
Nov.	30-60	123	22	-	1	-	226	-	-	-	-	-	-	3	-	11	386
2023	60-90	157	16	-	4	-	-	-	197	-	-	-	162	7	-	19	562
	90-120	79	8	-	1	-	-	-	-	-	260	-	-	11	-	13	372
	120+	160	21	-	-	-	-	-	-	-	-	5	-	63	-	41	290
	Total	382,663	1,001	114	622	19	248	2	205	3	272	13	176	167	1	8,297	

ROLL RATES FOR A SUBSET OF LOANS

All things being equal except new vs used car

- For a given originator, car model, for operating leases originated between 2018 and 2021
- For the second hand cars, the roll rate is a bit higher…



CONSTANT DEFAULT RATES (CDR)

OUR CDR BLOG IS NOW ONLINE...

https://eurodw.eu/leveraging-cdr-indices-for-benchmarking-purposes/

CONSTANT DEFAULT RATES IN ANNEX 12

ANNEX 12: NON-ABCP_INV_REP	Securitisation information section	IVSS27	Annualised Constant Default Rate	The annualised Constant Default Rate (CDR) for the underlying exposures based on the periodic CDR. Periodic CDR is equal to the [(total current balance of underlying exposures classified as defaulted during the period) / (total current balance of non-defaulted underlying exposures at the beginning of the period)]. This value is then annualised as follows: 100*(1-((1-Periodic CDR)^number of collection periods in a year)) "Periodic CDR" refers to the CDR during the last collection period, i.e. for a securitisation with quarterly paying bonds this will usually be the prior three month period.

Definition (ESMA)

The annualised Constant Default Rate (CDR) for the underlying exposures is based on the periodic CDR. Periodic CDR is equal to the [(total current balance of underlying exposures classified as defaulted during the period) / (total current balance of non-defaulted underlying exposures at the beginning of the period)]. This value is then annualised as follows:

100*(1-((1-Periodic CDR)^number of collection periods in a year))

"**Periodic CDR**" refers to the CDR during the last collection period, i.e. for a securitisation with quarterly paying bonds this will usually be the prior three-month period.

CONSTANT DEFAULT RATE CALCULATION

	Outstanding Balance*	Periodic Defaults
Dec 05	1,498,435,425	440,911
Jan 06	1,460,024,467	250,107
Feb 06	1,424,889,174	76,451
Mar 06	**1,365,652,894**	35,000
Apr 06	1,330,494,119	**415,976**
May 06	1,294,714,786	-
Jun 06	1,258,056,984	278,905

* Excluding Defaulted Loans

Monthly CDR calculation:

100*(1-((1-415,976/1,365,652,894)^12)) = 0.36%

	Outstanding Balance*	Periodic Defaults
Dec 05	1,498,435,425	440,911
Jan 06	**1,460,024,467**	250,107
Feb 06	1,424,889,174	**76,451**
Mar 06	1,365,652,894	**35,000**
Apr 06	1,330,494,119	**415,976**
May 06	1,294,714,786	-
Jun 06	1,258,056,984	278,905

* Excluding Defaulted Loans

Quarterly CDR calculation:

100*(1-((1-415,976/1,460,024,467)^4)) = 0.14%

CDR DATA VERIFICATIONS

Common data errors for CDRs

- Reporting a cumulative default instead of a CDR
- Reporting nothing (there are cases where no CDR is reported)

CDR Sanity checking

- When there is a CDR, we expect to see new defaults or at least outstanding defaults
- When outstanding defaults increase from one period to the next, there should be a CDR<> 0
- Some values are clearly excessive, for instance when compared to the amortised amount.

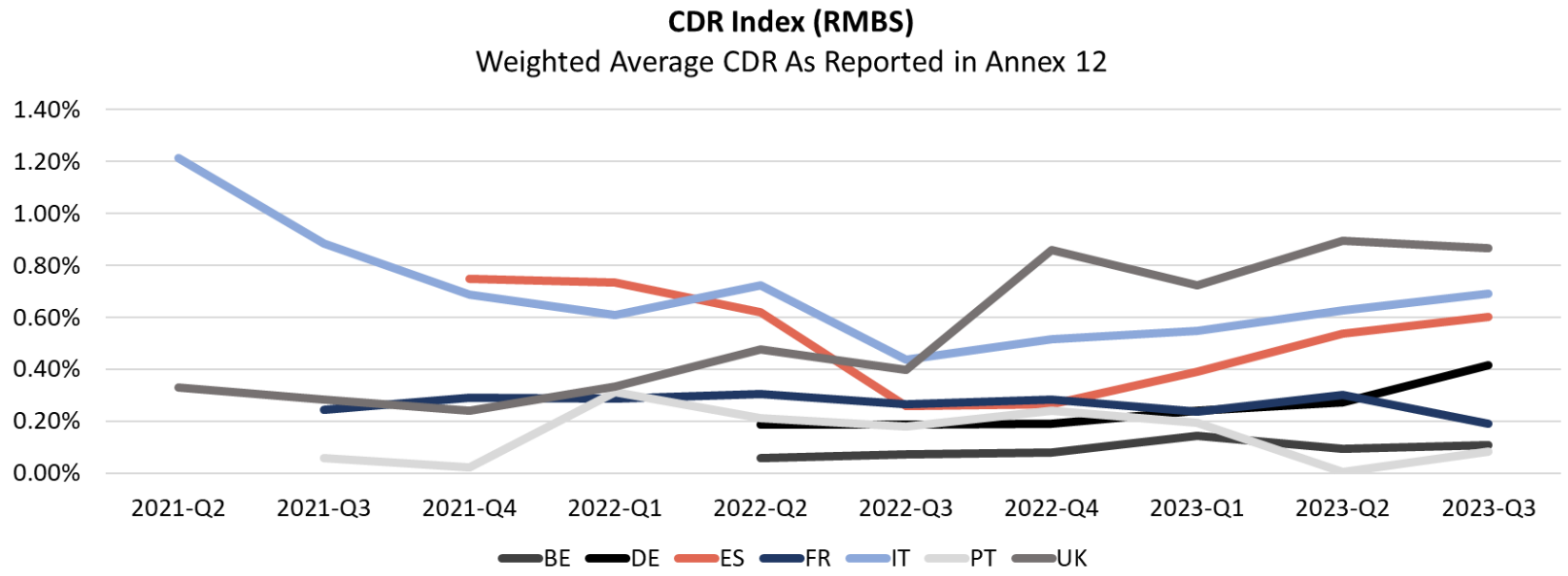
CDR Recalculation

Reported CDRs can be compared with CDRs recalculated using the Loan Level Data.

- Need to identify the loans reported as defaulted in the past period, which were not defaulted before
  - The default date in the last period is the obvious indicator, but it is sometimes populated with a lag.
  - A mix of criteria can be used to find new defaults: loans for the first time reporting a default status or amount or fulfilling default criteria
  - About 1/3 of Auto CDRs can be recalculated using the field „charge off“

CDR INDICES RMB

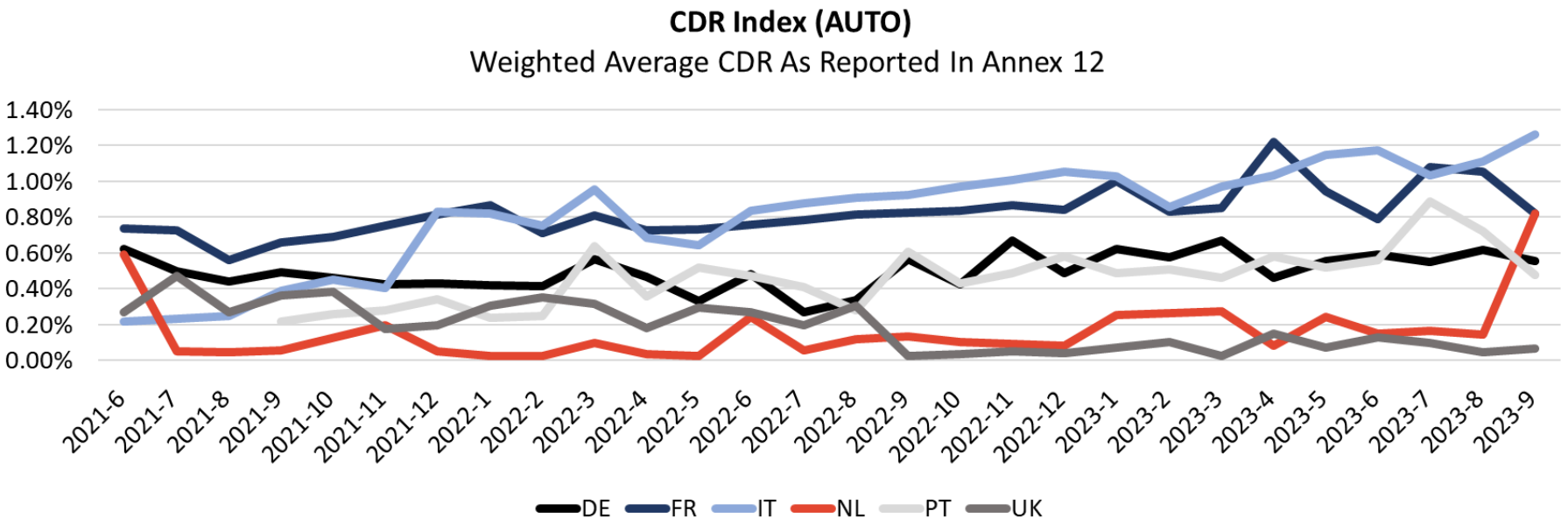
Residential Mortgages



Source: European DataWarehouse

CDR INDICES AUTO (1)

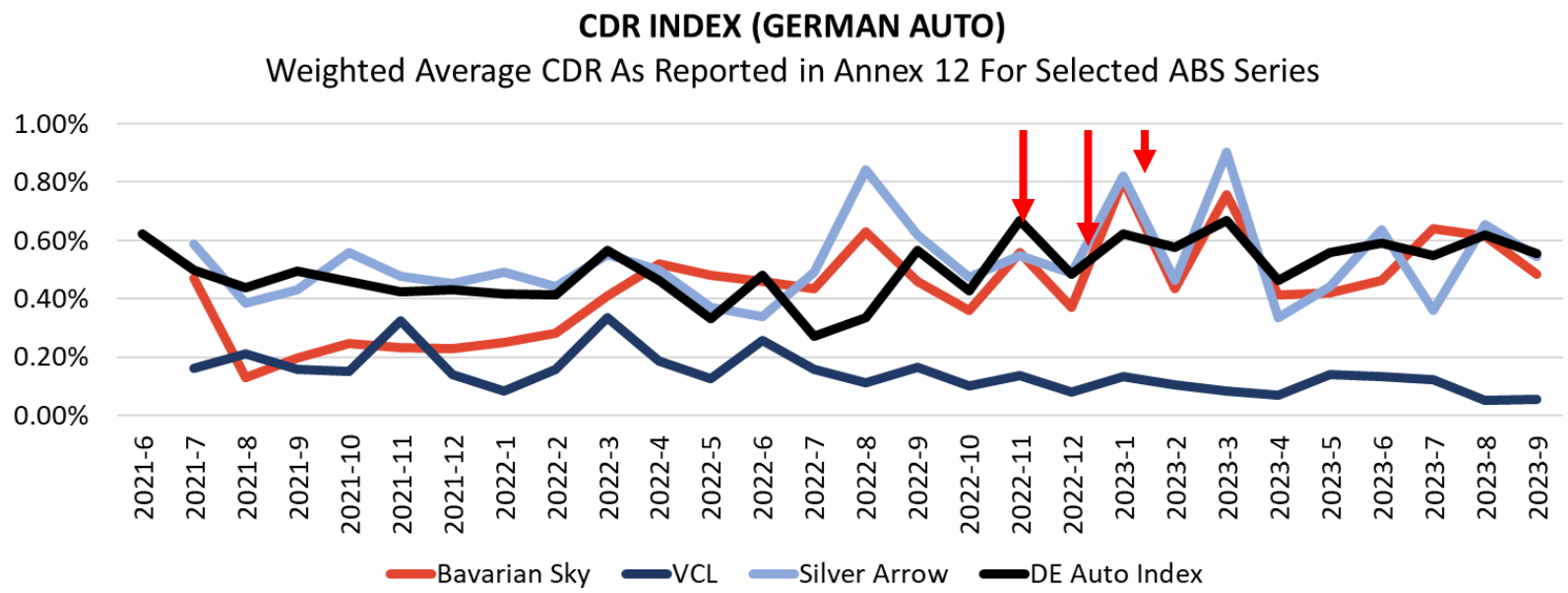
Auto



Source: European DataWarehouse

CDR INDICES AUTO (2)

Auto (Grouped by ABS Series)



Source: European DataWarehouse

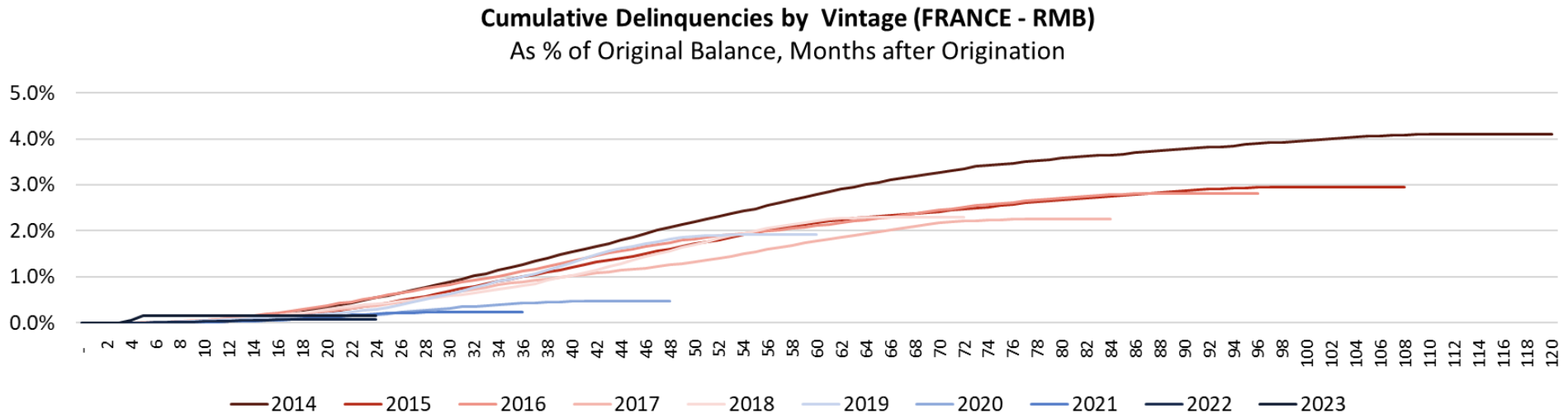
CUMULATIVE DELINQUENCIES (SEASONING CHARTS)

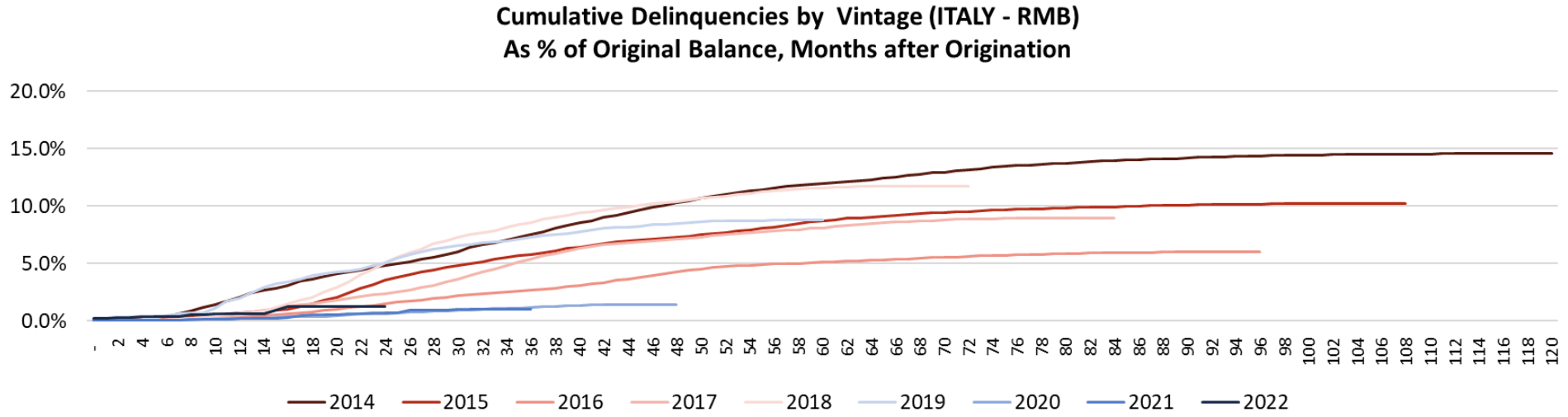
CUMULATIVE DELINQUENCIES

Calculation

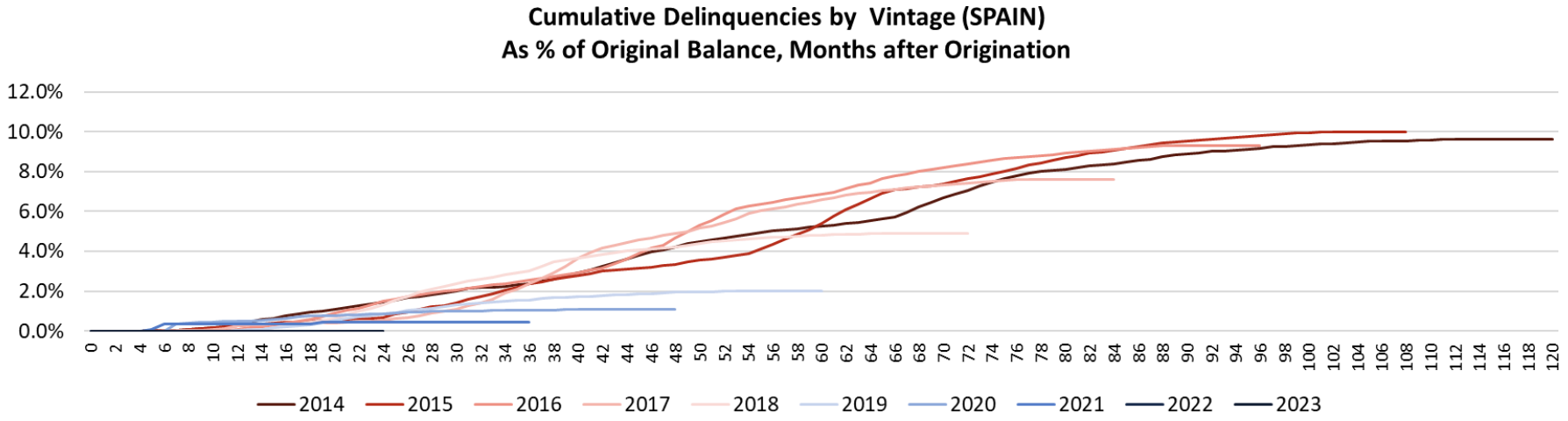
- We calculate for a certain point after loan origination (in months), the proportion of a subset of loans that has fulfilled specific delinquency and default criteria.
- We show the cumulative % of the outstanding amount of loans that have become delinquent or default up to that point as % of the original amount of these loans.
- There is some selection/survival bias in the charts as typically, only the loans that have not become delinquent are being securitised. We therefore „know“ that these loans were not in arrears between their origination date and their date of securitisation.
- The prerequisite is that the loan identifiers should be reported consistently
- It is then possible to look at cumulative delinquencies for a specific subset of loans…

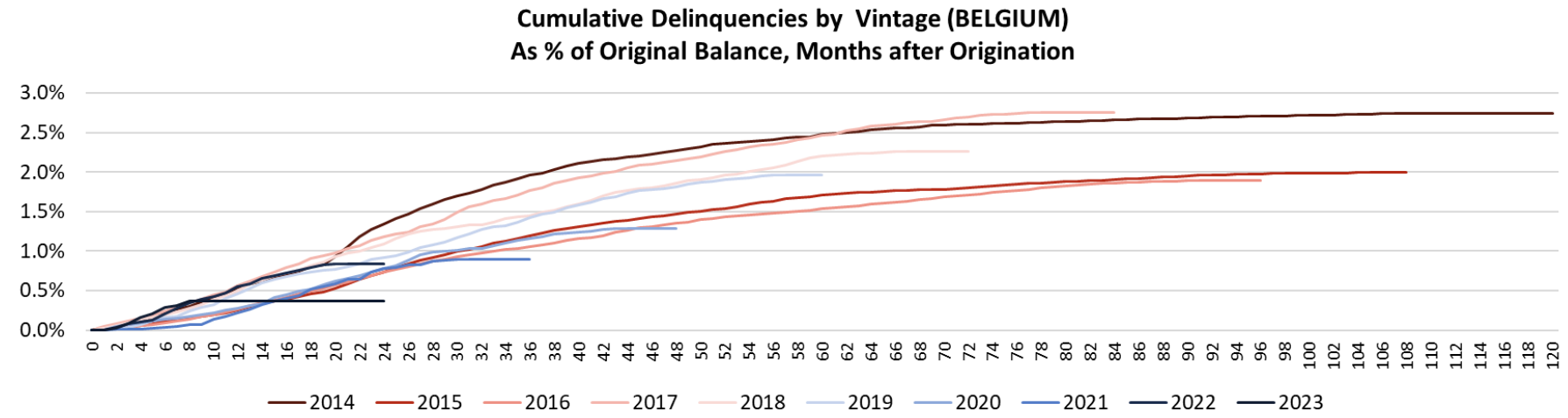
CUMULATIVE DELINQUENCIES – MORTGAGES (1)





CUMULATIVE DELINQUENCIES – MORTGAGES (2)

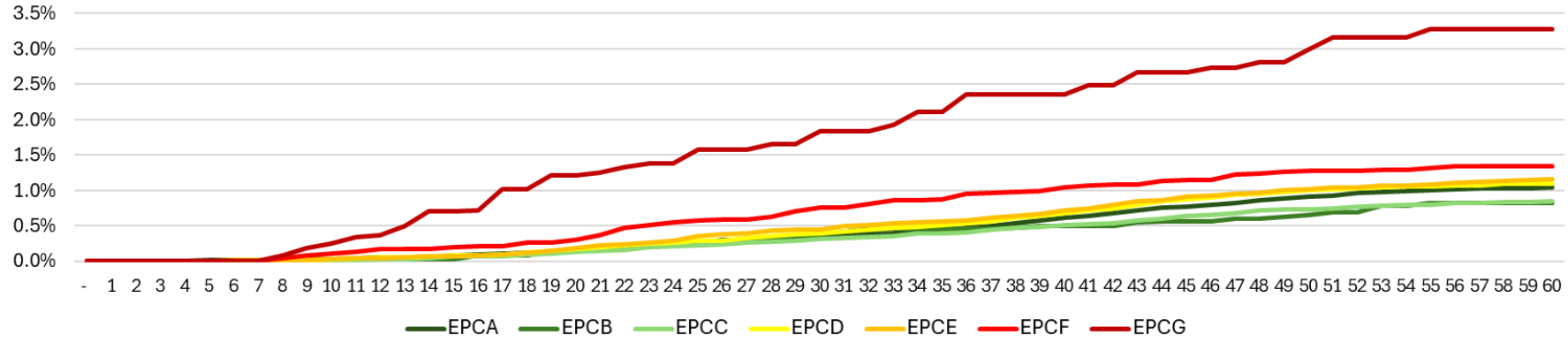




CUMULATIVE DELINQUENCIES – MORTGAGES (BY EPC CATEGORY)

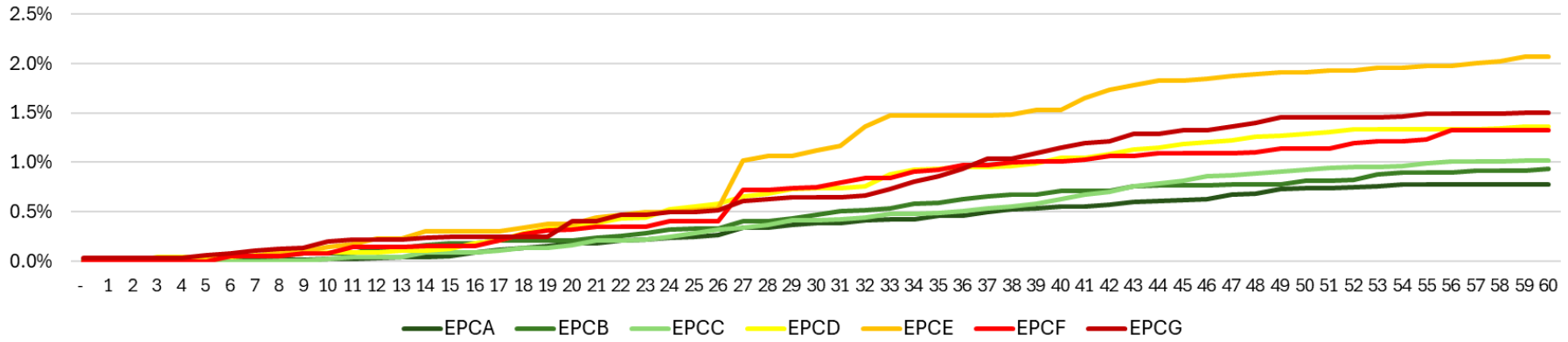
Cumulative Delinquencies by EPC (FRANCE - RMB)

As % of Original Balance, Months after Origination



Cumulative Delinquencies by EPC (NETHERLANDS - RMB)

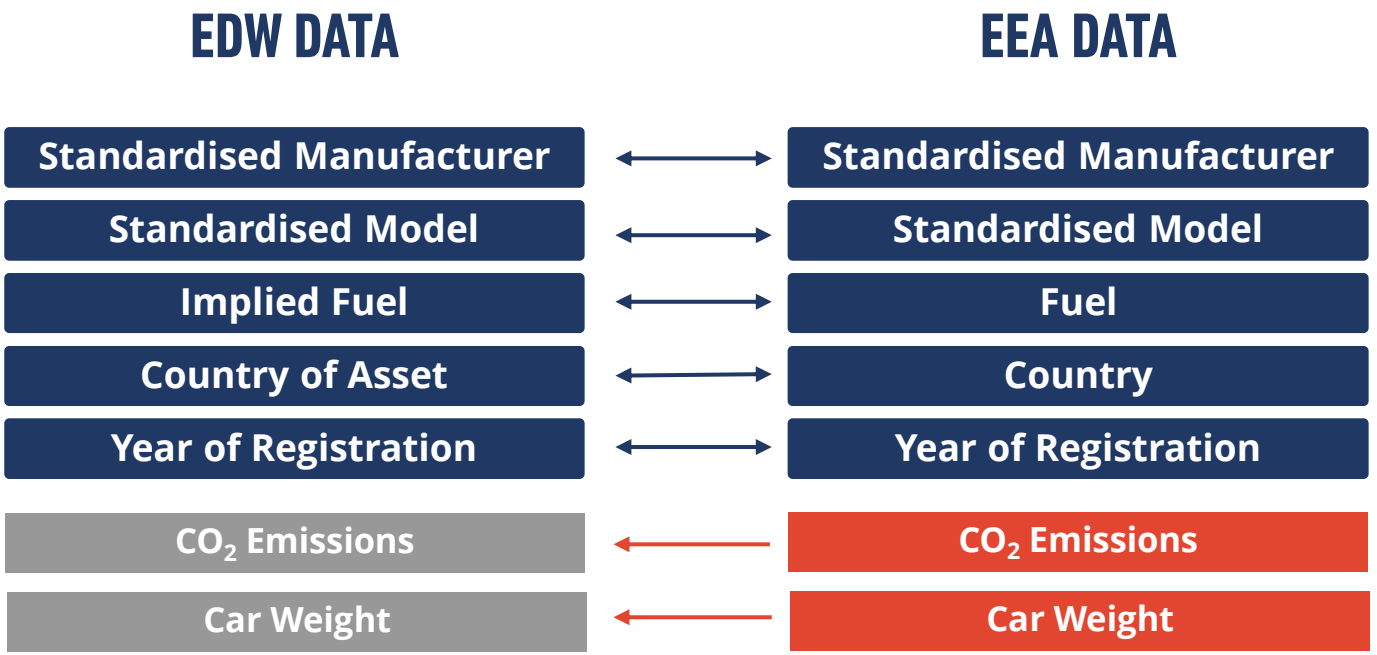
As % of Original Balance, Months after Origination



GAS PROJECT UPDATE

ESTIMATING CO_2 EMISSIONS FOR CAR LOANS/LEASES IN EDW DATA

Matching EDW data with European Environment Agency (EEA) data

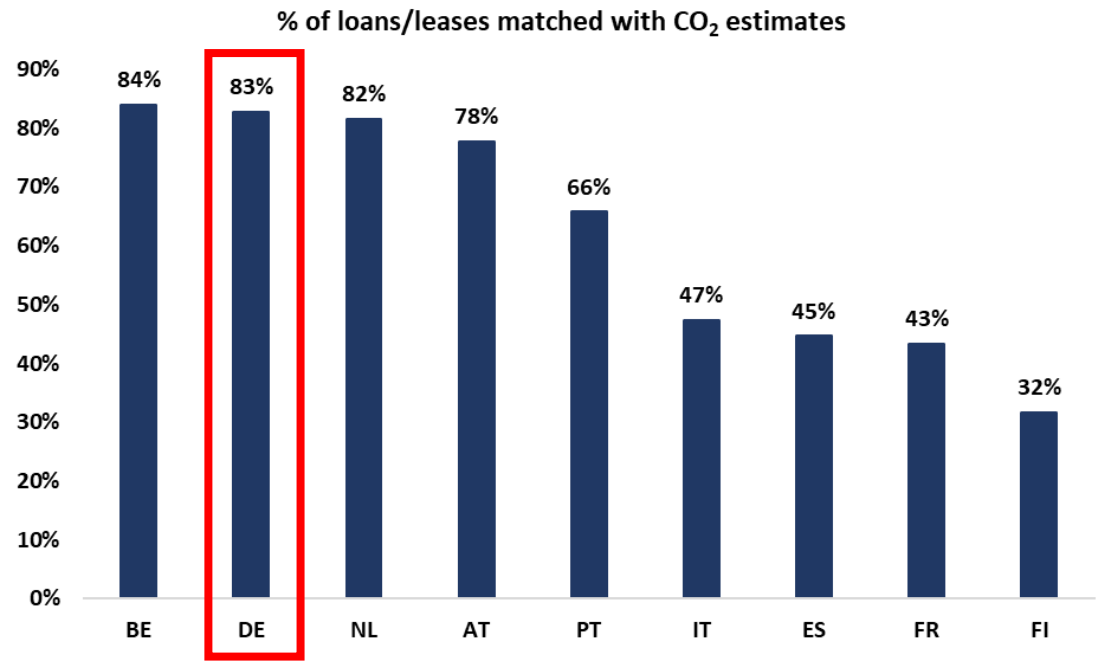


Assumptions

- If fuel cannot be implied using available info, the average CO_2 emissions of Petrol + Diesel cars for the manufacturer, model, year, and country are used
- For cases where only NEDC standard emissions are available, a factor of 1.2 is used to convert NEDC emissions to estimated WLTP emissions

CO2 EMISSIONS MATCHING

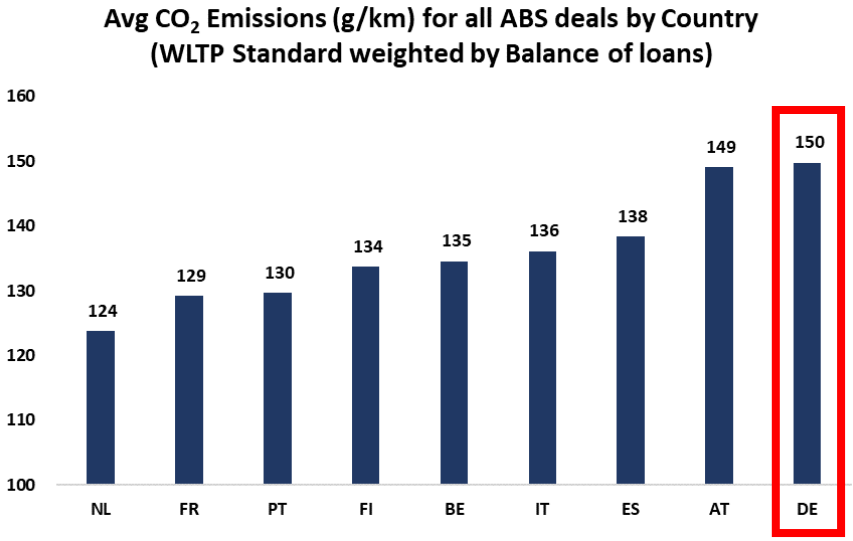
83% of German Auto loans/leases were matched with a CO_2 Emissions estimate



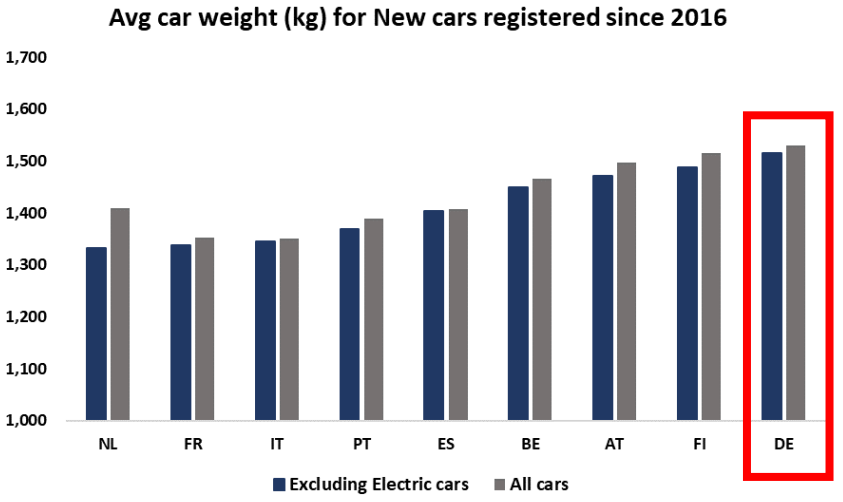
Source: European DataWarehouse

CO_2 EMISSIONS ESTIMATES

Germany has highest estimated average CO_2 emissions for cars in ABS portfolios



Source: European DataWarehouse

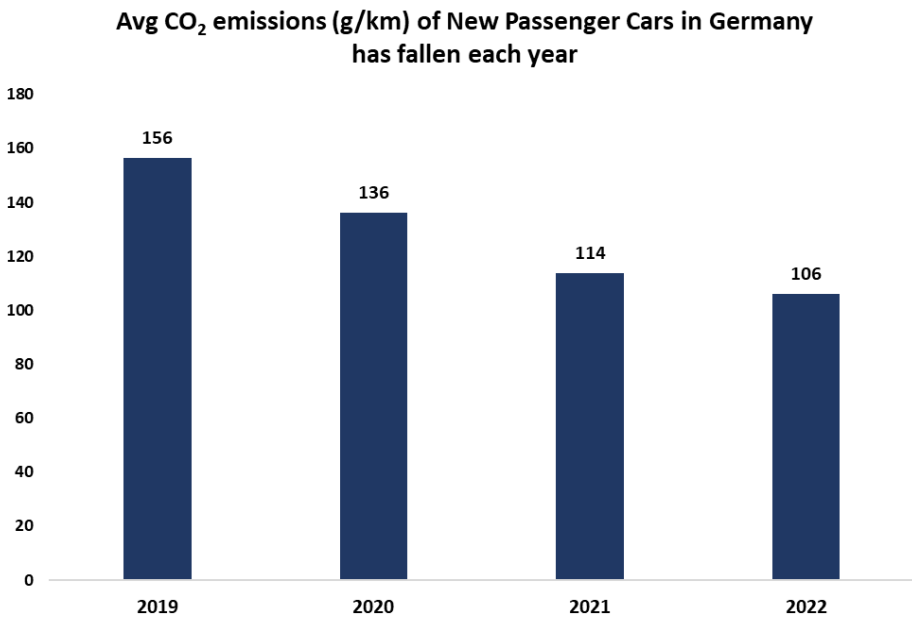


Source: European Environment Agency

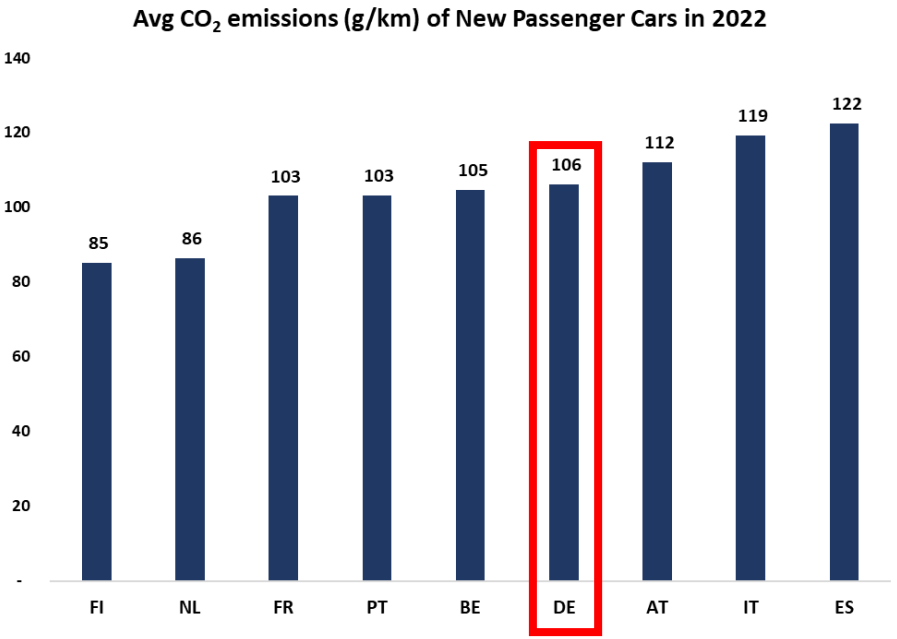
- German consumers appear to have a preference for heavier cars

CO_2 EMISSION TRENDS

German consumers are buying more low emission vehicles every year



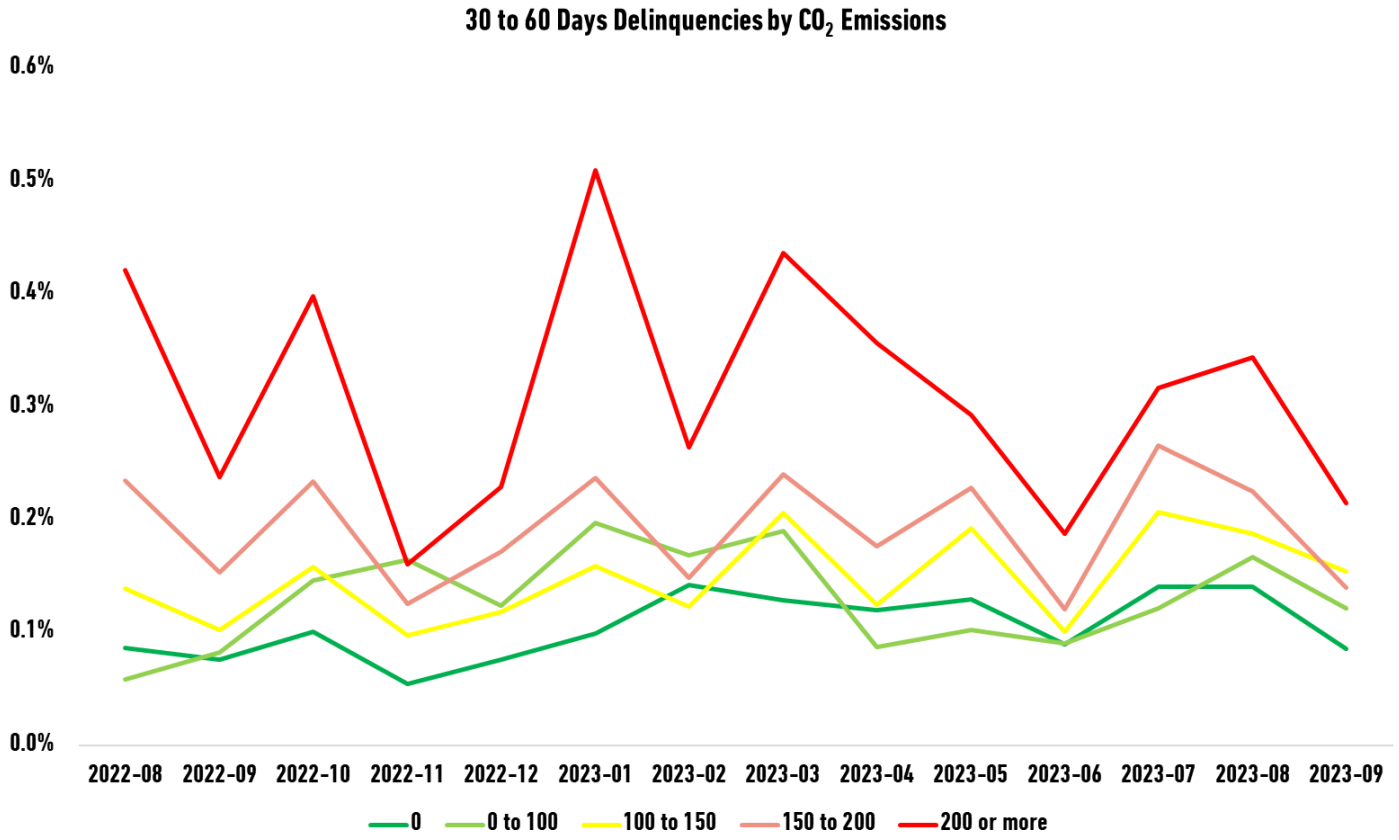
Source: European Environment Agency



Source: European Environment Agency

GERMAN AUTO ABS – 30 TO 60 DAY DELINQUENCIES (% OF BALANCE)

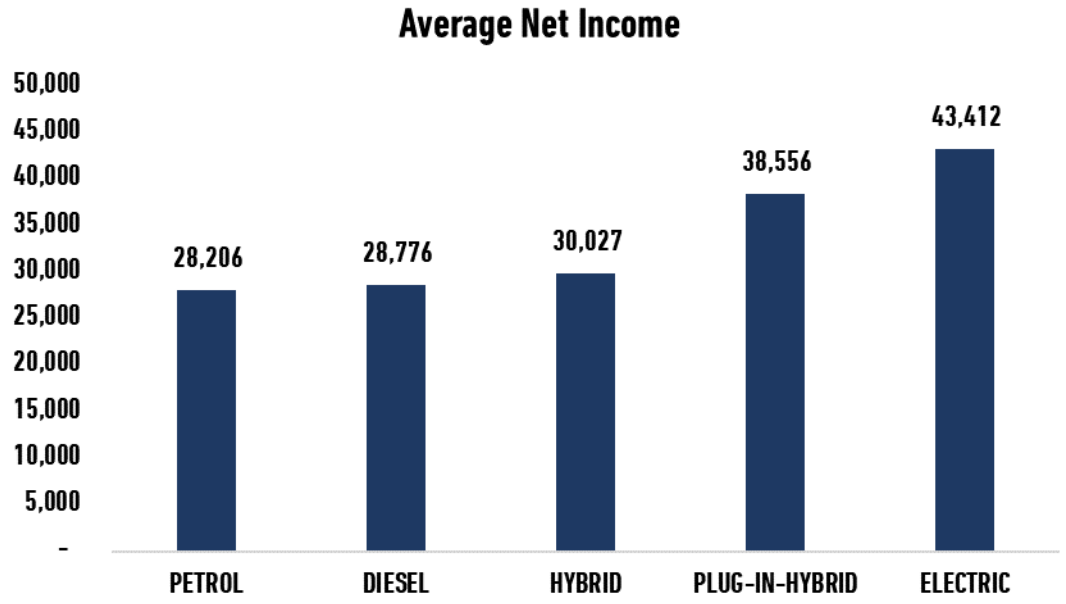
Low emission vehicles seem to have lower delinquency levels



Source: European DataWarehouse

AUTO ABS – AVG BORROWER INCOME BY FUEL TYPE IN GERMANY

Borrowers that get a loan/lease for Electric cars have the highest incomes

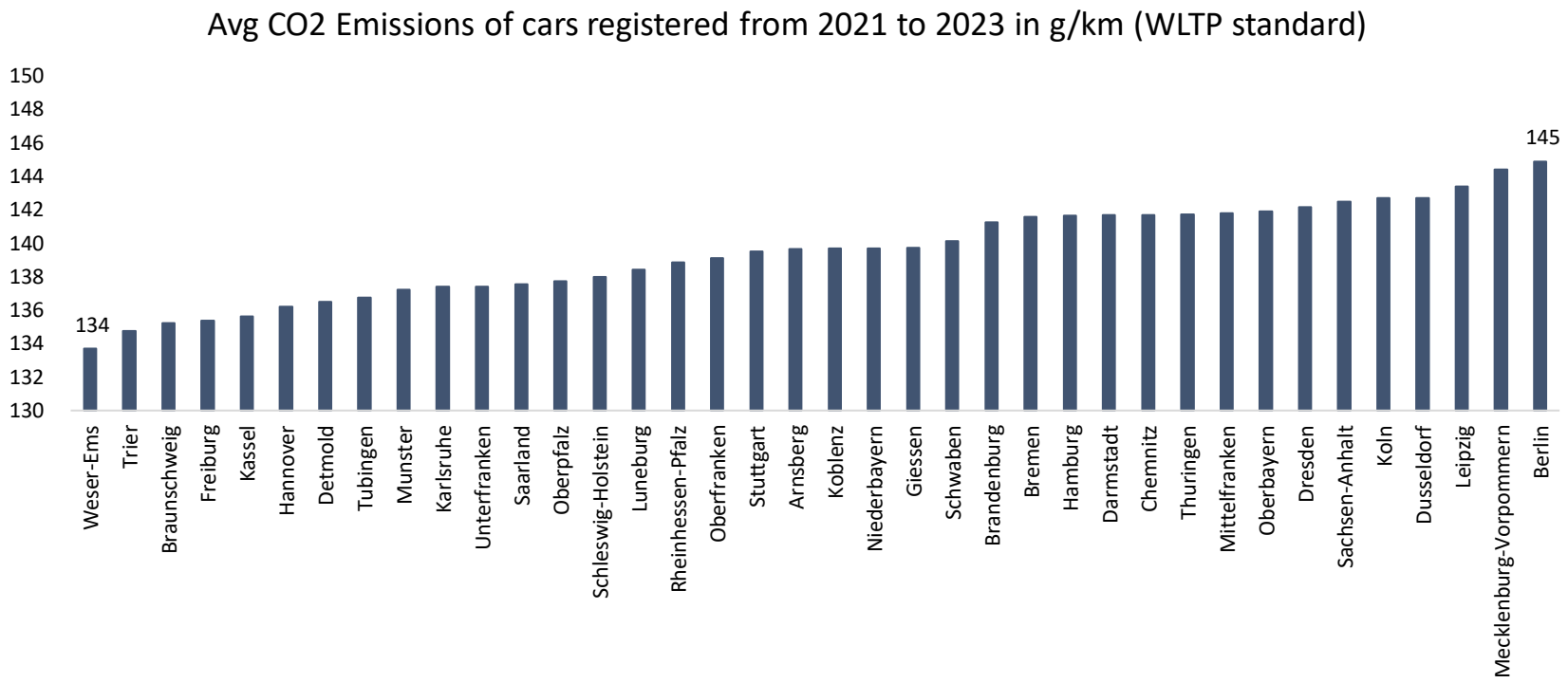


Source: European DataWarehouse

** Considering only loans and leases for employed borrowers with loans/leases originated since 2020*

AVG CO2 EMISSIONS ESTIMATES FOR CARS IN GERMANY BY REGION

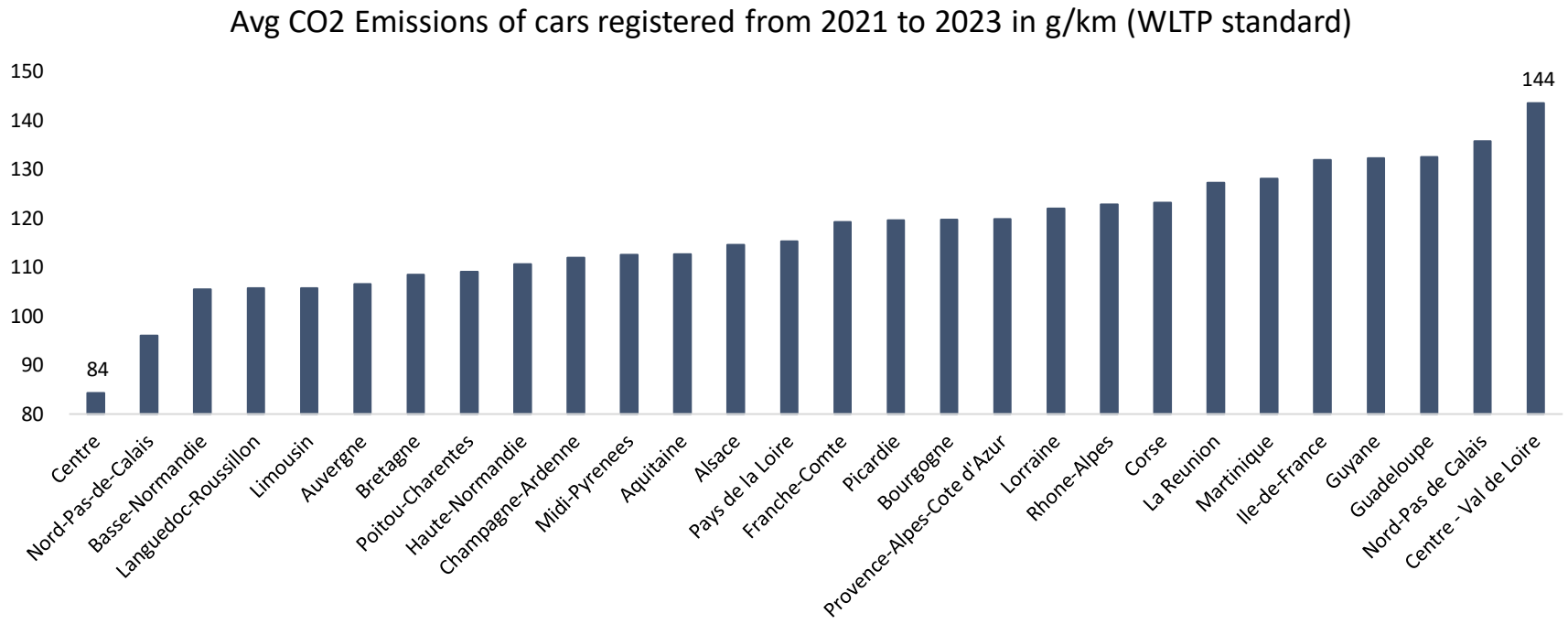
Berlin has the highest average
Weser-Ems has the lowest average



Source: European DataWarehouse

AVG CO2 EMISSIONS ESTIMATES FOR CARS IN FRANCE BY REGION

„Centre – Val de Loire“ has the highest average
Centre has the lowest average

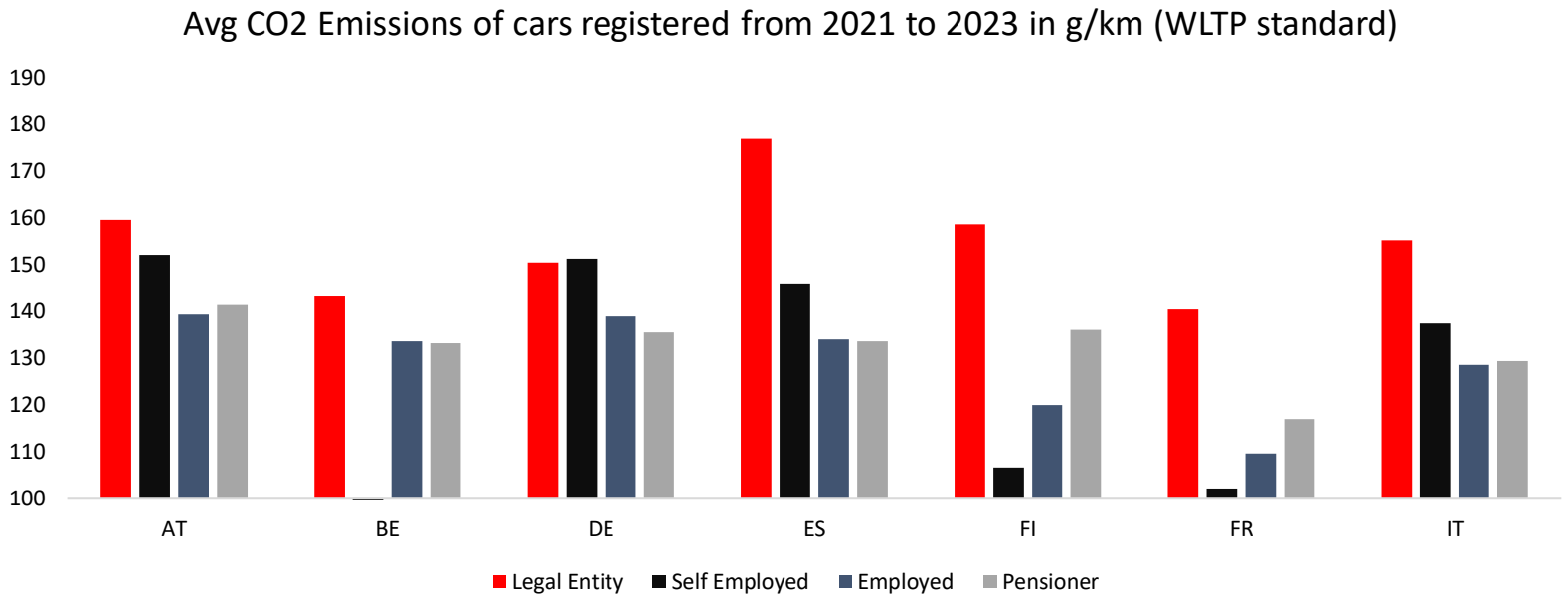


Source: European DataWarehouse

AVG CO2 EMISSIONS ESTIMATES FOR CARS BY EMPLOYMENT TYPE

Legal Entities consistently have the highest average

Self Employed borrowers in France and Finland have the lowest average emissions



Source: European DataWarehouse

BEFORE STARTING A NEW RESEARCH PROJECT...

PLEASE CONSULT US BEFORE PUBLISHING

To avoid missing something important...

- We have unique insight into the data and the securitisation sector
- It could be that you missed something important!
- We can help to check that the results make sense
- We are happy to discuss your research!

PLEASE LET US KNOW WHEN YOU PUBLISH A NEW PAPER

CHECK ACCESS RIGHTS

Data access types

- Due to EDW market share, tariffs for access to EDW data is differentiated depending on user:
  - Rating agency vs data vendor vs active market participant vs universities
  - Data access for universities is now €3000 per year, automatically renewable

University access allows

- Conduct and publish academic research using EDW data, nevertheless, please let us know once a publication using EDW data is about to be published.

University access DOES NOT ALLOW

- Re-distribution (sale) of EDW raw data to third parties (this requires a different contract)
- Using the data for consulting work (this also requires a different contract)
- Publicly displaying individual data

PLEASE READ THE CONTRACT CAREFULLY, WHEN IN DOUBT, PLEASE CONSULT US!

“TEXTUAL DISCLOSURES IN PROSPECTUSES AND INVESTOR’S SECURITY PRICING”

DR. PHILIPP KLEIN, UNIVERSITY OF MÜNSTER/UNIVERSITY OF PADERBORN

Textual Disclosure in Prospectuses and Investors' Security Pricing*

Jörn Debener, Arved Fenner, Philipp Klein, Steven Ongena

March 21, 2024

EDW Q1 Research Update Webinar

* This project was funded by the Deutsche Forschungsgemeinschaft (DFG), project number 466168740.

Motivation: Issuance prospectuses as the source of information

information on a financial product for an adequate pricing decision.

Issuers

… are incentivized to avoid high yield spreads demanded by investors and avoid litigation risk.

Issuance prospectuses

- Reducing information asymmetries (Myers & Majluf, 1984)
- Are meant to protect investors
- Basis for efficient security markets

→ Prospectuses as complex and extensive disclaimers (Hanley & Hoberg, 2010)

→ Impaired quality and risk evaluation through opaque prospectus design (Ellison & Ellison, 2009; Ellison & Wolitzky, 2012)

Motivation: Prospectuses design

- EU Directive 2003/71/EC ("EU Prospectus Directive") remained insufficient (EU Commission, 2015)

Status Quo

Prospectuses „contain substantial repetition of text, [...], may present generic and imprecise risk factors, and may include unclear language" and thus "an abundance of material can present a challenge for even specialized readers to identify information that is key to assessing the product."

European Securities and Markets Authority, 2022

- Financial crisis 2007/08
  - Investors did not fully understand the risk of securities, particularly ABS (Coval et al., 2009)
  - Neglection of important textual information for pricing (Zhang et al., 2024)

General research question

How does the quality and quantity of textual disclosure in prospectuses affect investors' security pricing?

Literature review and securitization framework

Design of issuance prospectuses and provision of information

- Complexity in information presentation increases issuers' profits (Celerier und Vallee, 2017; deHaan et al., 2021)
- Easier analyzable quantitative information increases the adequacy of investors' ABS pricing (Neilson et al., 2022)
- Missing consideration of qualitative information in the pricing of MBS (Ghent et al., 2019; Zhang et al., 2024)

Securitizations as an optimal investigation framework

- Securitization transactions are complex and individualized financial products (Furfine, 2014)
- Investors have only few if any, publicly available information and their behavior among themselves is hardly observable (compared to traditional stock or bond markets, which have been studied most extensively so far)
- ABS are facing a greatly varying level of default risk corresponding to one prospectus
- Only downside risks for debt investors, in contrast to fund or equity investment positions

Our research paper – a preview of the results

The textual quality and quantity of issuance prospectuses influence the investors' pricing decision of securities.

Boilerplate language is interpreted as a signal of low security risk, particularly in the case of low default risk and high information asymmetry.

Longer prospectuses act as a warning signal and lead to higher required yield spreads for riskier investments when information asymmetries are low.

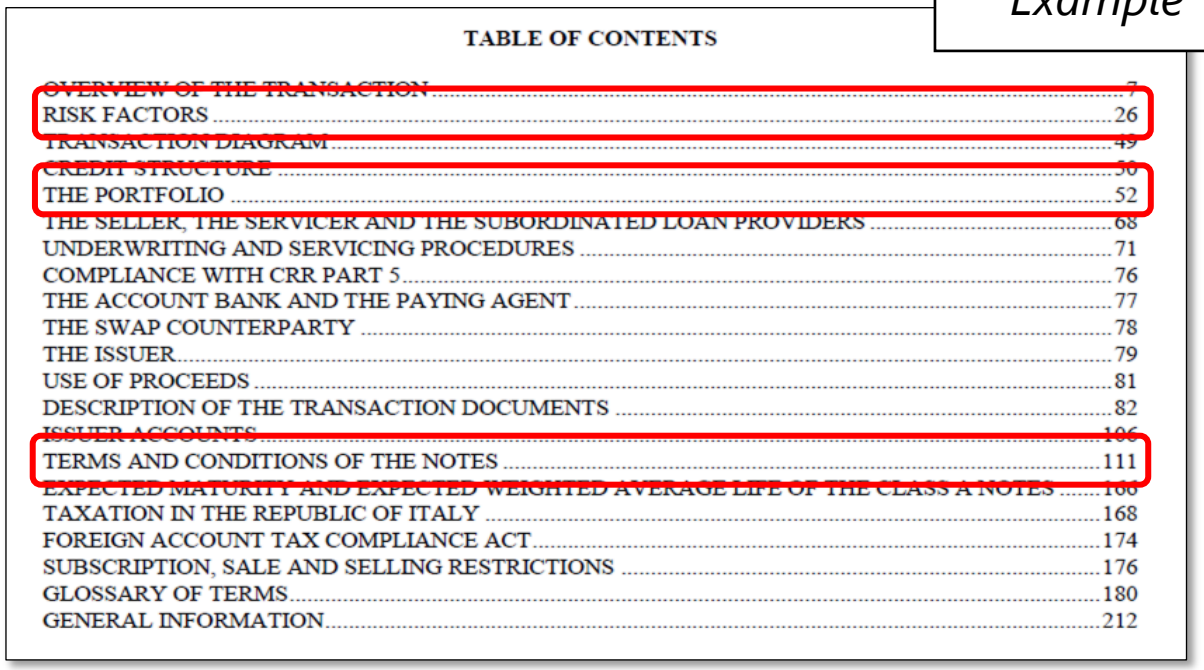
3. These effects distort adequate pricing at the time of issue.
4. Issuing companies react to regulatory changes and standardize the design of their issuance prospectuses.

The prospectuses in our data set

§ *The information (…) should be written and presented in an easily analyzable, concise and comprehensible (…). A prospectus should not contain information which is not material or specific to the (…) the securities (…).“* §

- Lengthy documents with a vast amount of information on
  - the risk factors,
  - the loan portfolio,
  - the transaction structure, …
- Parties also involved in preparation: Arranger, law firms, …

Example



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Textual quality & quantity

Boilerplate language

Tetragrams (4-word phrases), 33.33% appearance in the same asset class

„[The] ability [of the] issuer [to] meet [its] obligations [(...) will depend upon its continued solvency.]“

Linguistic complexity

Gunning’s FOG Index (years of formal education necessary to directly understand the text)

Prospectus length

Logarithm (Number of words)

Ø Boilerplate language:	39 % (3 % - 78 %)
Ø Linguistic complexity:	23,73 (20,50 – 26,21)
Ø Prospectus length (in words):	92.000 (39.000 - 170.000)

Data

- **European DataWarehouse**
  - Very detailed securitization data on transaction, security, and loan level, and the respective issuance prospectuses
  - Additionally: Hand-collected prospectuses (if publicly available)
- **S&P Global** (performance, rating, and price data of the securities)
- Refinitiv Eikon, ECB, FRED (interbank and government bond interest rates)

Data set

- 1.014 European securitization transactions, 2.469 securities issued between 2002 and 2020
- 39,4 million individual loans from six asset classes and 14 countries
- All securitization transactions of the ECB Loan-level Reporting Initiative

Textual design of prospectuses and ABS-pricing (I/II)

Research question 1

How does the textual design of the issuance prospectus affects the pricing by investors?

Linear regression model

$$Yield\ spread_{i,s} = \beta_0 + \beta_1 * Text.Quality\ \&\ Quantity_i + \beta_2 * Control\ variables_{i,s} + Fixed\ Effects_{i,s} + \epsilon_{i,s}$$

- Dependent variable: Initially demanded Yield spread
- Most important independent variables: Boilerplate language, Linguistic complexity, and Prospectus length as measures of textual quality & quantity
- Control variables: Interest rate, No. tranches, rating disagreement, tranche width, tranche balance, years to maturity, excess interest, subordination
- Fixed effects: Origination year, Asset class, Country, Rating, Coupon Type

Textual design of prospectuses and ABS-pricing (II/II)

	Yield spread			
Boilerplate language	**-0,830*** **			**-0,769** ** (0,306)
Linguistic complexity		-0,029 (0,025)		-0,026 (0,024)
Prospectus length			**0,311** **	**0,337*** ** (0,124)
Control variables	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes
Observations	2.469	2.469	2.469	2.469
Adj. R^2	0,60	0,60	0,60	0,61

* p < 0,1; ** p < 0,05; *** p < 0,01

Results

One SD more

- **Boilerplate language:**
  ~ 17 bp (18%) lower yield spread
- **Prospectus length:**
  ~ 12 bp (13%) higher yield spread

Textual design and the predictive ability of pricing (I/III)

Research question 2

How does the textual design of the issuance prospectus affects the adequacy of the demanded yield spread?

Informativeness of the **yield spread** at issue for **performance** over the security's lifetime (He et al., 2016; Neilson et al., 2022)

$$
\begin{aligned}
Interest\ shortfall_{i,s} = {} & \beta_0 + \beta_1 * Yield\ Spread_{i,s} \\
& + \beta_2 * Text.Quality\ \&\ Quantity_i * Yield\ Spread_{i,s} \\
& + \beta_3 * Text.Quality\ \&\ Quantity_i \\
& + \beta_4 * Control\ Variables_{i,s} \\
& + Fixed\ Effects_{i,s} + \epsilon_{i,s}
\end{aligned}
$$

Textual design and the predictive ability of pricing (II/III)

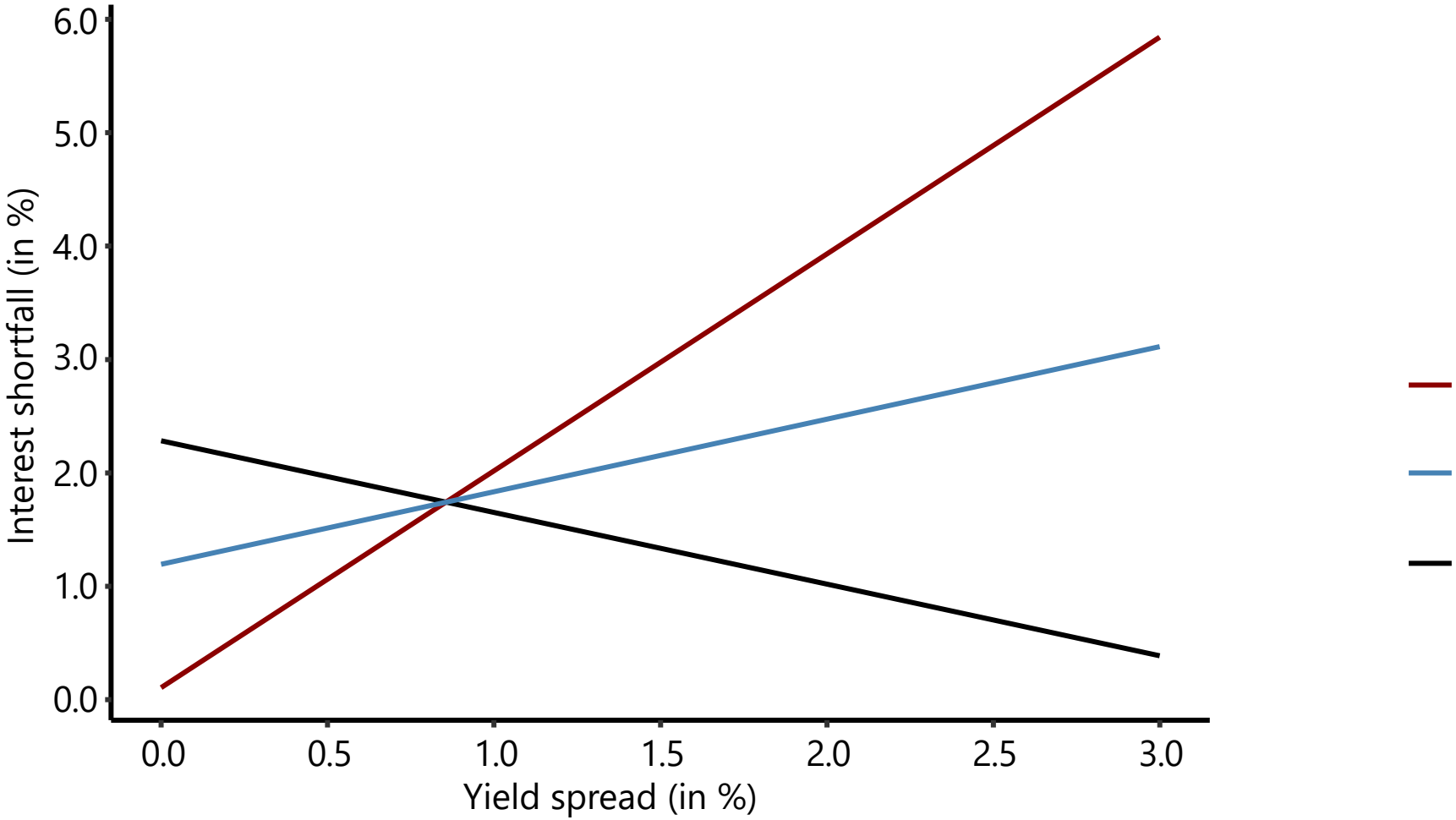
	Interest shortfall			
Yield spread	3,149*** (0,864)	10,280*** (3,408)	25,880*** (7,168)	7,443* (4,406)
Boilerplate language x Yield spread	**-6,359*** (1,651)**			**-6,036** (1,821)**
Linguistic complexity x Yield spread		**-0,414*** (0,141)**		-0,115 (0,213)
Prospectus length x Yield spread			**-2,212*** (0,611)**	-0,622 (0,629)
Boilerplate language	5,443*** (1,517)			5,282*** (1,581)
Linguistic complexity		-0,465*** (0,135)		-0,069 (0,104)
Prospectus length			3,111*** (0,857)	1,714*** (0,614)
Control variables & Fixed effects	Yes	Yes	Yes	Yes
Observations	2.469	2.469	2.469	2.469
Adj. R^2	0,23	0,20	0,21	0,23

* p < 0,1; ** p < 0,05; *** p < 0,01

Results

- Predictive ability of the yield spread for the interest shortfalls.
- Decreasing predictive power in case of more standardized, linguistically more complex, or longer prospectuses
- Advantageousness for investors and issuers ex ante not straightforward
- Negative impact on the efficiency of the security market

Textual design and the predictive ability of pricing (III/III)



Effects of EU regulations on prospectus design (I/II)

Research question 3

Have the recent regulatory measures incentivized issuers to adjust their prospectus design?

- Regulatory measures: **EU Prospectus regulation** and **Securitization regulation**

- **Objectives:** Stronger investor protection and higher market efficiency through more precise, comprehensive, and specific information on security risks and returns
- Estimation of a difference-in-differences regression model (based on deHaan et al., 2021)

$$Text.Quality\ \&\ Quantity_i = \beta_0 + \beta_1 * Text.Quality\ \&\ Quantity\ (high)_i + \beta_2 * Text.Quality\ \&\ Quantity\ (high)_i * Post + Fixed\ Effects_i + \epsilon_i$$

Effects of EU regulations on prospectus design (II/II)

	Boilerplate language	Linguistic Complexity	Prospectus length
Boilerplate language (high) x Post	**-0,045****		
Linguistic complexity (high) x Post		-0,355	
Prospectus length (high) x Post			**-0,120**** (0,048)
Boilerplate language (high)	0,076*** (0,018)		
Linguistic complexity (high)		1,054*** (0,317)	
Prospectus length (high)			0,222*** (0,069)
Fixed Effects	Yes	Yes	Yes
Beobachtungen	414	463	393
Adj. R^2	0,80	0,72	0,69

* p < 0,1; ** p < 0,05; *** p < 0,01

Results

- Issuers of particularly standardized, linguistically complex and lengthy prospectuses write shorter and more individualized ones.
- Results for risk descriptions are even more pronounced
- Prospectuses more homogeneous due to regulatory requirements

Robustness analyses (excerpts)

- Alternative definitions of textual measures
  - Boilerplate language: 6-word combinations that are found in 50 % of prospectuses
  - Flesch-Kincaid index instead of Gunning's FOG index
  - Number of pages instead of the number of words
- Orthogonalization of the textual measures according to
  - the quality of the loan portfolio and the performance
  - the transaction complexity
- Control of the law firms involved in the issuance process
- Estimation using only the floating rate bonds
- Utilization of the entire time period for the impact of regulation (instead of 2010-2020)

Conclusion & Outlook

- The design of textual information has a significant impact on investors' risk perception and pricing
- Declining market efficiency and potential welfare losses
- The degree of default risk, asymmetric information, and visualization determine the impact of boilerplate language, linguistic complexity, and prospectus length

Thank you for your attention!

Our paper on SSRN

Q&A

AND NOW...

... DO YOUR OWN RESEARCH!

THANK YOU//CONTACT

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