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ANALYSES ET SYNTHESES

How may risk weights differ across banks? Evidence from the corporate portfolios of French banks

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Contents

Summary

This article analyses the dispersion of risk weights for large corporate portfolios and identifies the sources of dispersion among banks in terms of the Basel risk parameters. The analysis focuses on loans granted by 5 large French banking groups to large corporates operating in France and rated by several banks under the Advanced Internal Rating Based approach (the so-called AIRB approach). The analysis differs from the existing studies since it is based on a detailed dataset of common counterparties for the five banks. Since the comparison is done on identical counterparties, the differences in RW or in risk parameters are not related to the composition of loan portfolios. This article uses a unique dataset that has been collected by the APCR in 2012 through an ad hoc survey sent to banks regarding a sample of common counterparties among the five banks.

The analysis shows that banks have similar RWA rates (Risk-Weighted Assets/Exposures at Default), except one bank which is more conservative than others. Regarding Probabilities of Default (PDs), the banks exhibit broadly similar levels of average PDs. But, for Loss Given Defaults (LGDs), there is a wider dispersion. The analysis also shows that the dispersion on the RWA rates is mainly due to differences in LGDs more than the other parameters. Part of the dispersion in LGDs may be related to differences across banks in their collateral policy as well as the inclusion of collateral in LGD calculation, and in the effectiveness of the recovery process in case of default. In addition, the regulatory provision to add margins of conservatism to cover the expected range of estimation errors, may also be an explanatory factor of this dispersion, as well as the calculation of the downturn LGD.

If some differences observed in LGD estimates would appear unwarranted, it could be considered to improve harmonization by focusing supervision of internal models on LGDs and by providing more rules for their computation. Therefore, in the debate around the role of the AIRB approach, this article suggests that, instead of replacing this approach, the current framework for large corporates portfolios could rather be adapted to restore confidence in internal models.

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1. Introduction

Basel II introduced the internal rating based (IRB) approach which allows banks, subject to supervisory approval, to replace standardized risk weights (RWs) with parameters estimated directly by the banks, using their own internal rating systems. In the aftermath of the crisis, concerns have arisen about the accuracy and variability of these risk weights and some observers have raised a number of shortcomings of the IRB approach. Among the most common criticisms, the diversity of computing options (dispersion of models scope and diversity of parameter estimation) would not facilitate comparison across banks and would not provide a reasonable level playing field. As a result of this diversity, some claim that IRB banks would use this room left open by the IRB approach to game (intentionally or not) with risk parameters so as to minimize capital charges.

Debate is currently ongoing in the supervisory community on the role of the IRB approach for credit risk in the capital adequacy framework. Some argue that the IRB approach is inherently complex and thus difficult to enforce. For instance, Daniel Tarullo from the Federal Reserve System argued recently that IRB had "little useful role to play" and that it could be replaced by a combination of standardised capital requirements and regulatory stress tests for larger institutions. Other acknowledge the enforcement problem of the IRB approach but are more in favor of adapting the current framework instead of eliminating the role of internal models. For instance, Andrew Haldane from the Bank of England is in favor of more supervision and more transparency for internal models or the introduction of floors on risk weights.

We see our contribution as helping to inform this debate, i.e. identify the sources of RWs variability using granular data about Basel risk parameters, and provide recommendation on how to reduce such variability if undue. We present the results of a comparison exercise conducted on the corporate loan portfolios of five French banks under the Advanced IRB approach.[1] We analyse the dispersion in RWs based on a set of common counterparties for these five banks and we try to explain these differences by comparing data on risk parameters obtained through ad hoc surveys conducted by the ACPR. Therefore, we are able to disentangle the effect of risk parameters and the effect of composition of the loan portfolios.

[1] In addition to the basic IRB approach estimations (Probability of Default or PD), the AIRB approach allows banks to estimate more risk components themselves, such as loss given default (LGD) and exposure at default (EAD).

We find that there is some dispersion in the ratio (Risk Weighted Assets/ Exposure at Default) across banks in particular for one bank even after controlling for the composition of exposures. Looking at individual risk parameters, we are able to explain these differences. For Probabilities of Default (PDs), the banks exhibit broadly similar levels of average PDs. For Losses Given Default (LGDs), there is wider dispersion with different practices. In a second step, we find some dispersion on the RWA rates (RWA/EaD) which is mainly due to differences in LGD. The differences in LGD across banks appear to be linked to differences in the collateralisation process and the effectiveness of the recovery process in case of default. In addition, the regulatory provision to add margins of conservatism to cover the expected range of estimation errors, may also be an explanatory factor of this dispersion, as well as the calculation of downturn LGD.

Our findings have important policy implications. Instead of eliminating the IRB approach, they provide useful ways to adapt the current framework in order to answer critics and to restore confidence. It appears that differences in LGDs are important determinants of differences in RWA rates. If differences in LGD estimates are unwarranted, it could be considered to provide more rules in order to increase harmonization in the banks' modelling techniques of LGD.

The rest of the article is organized as follows. In the next section we briefly sum up the main result of the related literature. We describe our dataset in Section 3, we present our main findings in Section 4 and then we conclude in Section 5.

2. Related literature

The global financial crisis put the Basel 2 framework for the computation of RW under scrutiny. Broadly speaking, the recent academic and institutional literature divides into three general questions: how do the risk weighted solvency ratios perform in predicting the occurrence of bank distress? To which extent do the regulatory RWA cover the underlying risk of the banking portfolios? To which extent are the RWA consistent across banks?

Related to the first question –the RWA as a good early-warning indicator of banking crisis- the literature provides mixed results. The adoption of the Basel 2 framework was coincidental –for the early adopters e.g. the European banks- to the outbreak of the global financial crisis- making very challenging a disjointed identification of these two channels on the portfolio measure of riskiness embedded in the RWAs. The IRB banks might be at the same time, the ones that both benefited the more from the adoption and the ones that suffered the more from the crisis due to their portfolio structure. Acharya et al. (2014) find a low predictive performance of the stressed RW taken from the EBA 2011 stress testing exercise released in July 2011 on the ex-post six-month realized volatility. This result is somewhat expected since firstly, the publication of the EBA in July 2011 was followed two months later by the acceleration of the European sovereign debt crisis which was not considered in the stress testing macroeconomic scenario and secondly, the regulation gives low risk weights to sovereign debt.[2] Haldane (2011) supports the finding that market based ratios contain more information than the regulatory ratio for predicting bank's distress. In contrast, Mariathasan and Merrouche (2012) find that the risk-weighted asset ratio to be a superior predictor of bank failure when banks operate under the Basel II regime provided that the risk of a crisis is low. However, their analysis also shows that, when the risk of a crisis is high, the un-weighted leverage ratio is the most reliable predictor. Demiruc-Kunt, Detragiache and Merrouche (2013) show, on a sample dominated by Japanese banks and U.S banks, that the leverage ratio is a better predictor of stock return than the risk-adjusted capital ratio. Such a result has implications in terms of funding constraints, but maybe not directly in terms of bank failures.

[2] Sovereign portfolios are frequently weighted under standard approach rather than under the IRB approach.

Related to the second question on the cross-sectional underestimation of the risk by RWA, a small set of papers exploiting granular data available at the portfolio level and over a long period of time compares the regulatory risk weights to the one computed with more sophisticated models of economic capital than the Basel 2 regulatory formula. Beyond the issue of regulatory arbitrage or the argument of level playing field, this strand of literature tries to answer a more fundamental question: is the amount of regulatory capital enough to absorb credit losses under a stress scenario? On representative samples of loans granted by the banks to the corporate sector, Dietsch et al. (2013), Düllman et al. (2013) and Bams et al. (2012) show – respectively for the French, the German and the US portfolios – that the RWA computed under the regulatory formula are larger than the ones computed from economic capital models.[3]

Related to the third question, a small but growing number of papers analyse the issues surrounding the sources of RWA heterogeneity across banks. Current studies mostly come from supervisors or international organizations (BIS, EBA). A first rand of studies have been performed either at the national level or at the bank level. Le Leslé and Avramova (2012) provide evidence of heterogeneity regarding "RWA density"[4], across and within national regulatory approaches. They identify possible driving forces behind this variation: banks' business models, quality of portfolios but also institutional, accounting and regulatory parameters. Complementing this paper, the EBA's first interim report on the consistency of the RWA in the banking book (2013a) documents, based on individual bank data[5], that 50% of the global charge[6] stems from the approach used for computing RWAs (Standard approach versus IRB approach) as well as from the composition of the portfolio (retail versus corporate). The remaining 50% stem from the IRB risk parameters. They reflect each bank's specific portfolio and risk management practices, the banks' internal practices regarding the implementation of the IRB approach, the national differences in implementation of the Basel standards and in the supervision of internal models. In order to disentangle the impact of the portfolio characteristics from the impact of the implementation of the IRB approach, a second rand of studies compares IRB risk parameters of common counterparties across banks and found material differences (see for example EBA, 2013b or BIS, 2013).

[3] Indeed, these economic capital models allow for more sources of diversification and estimate the "true" sensitivity to different factors.

[4] "RWA density" is measured as the percentage of RWAs over Total Assets.

[5] The database used to conduct the analysis is the EBA's Impact Study Group (ISG) dataset. The ISG dataset contains information from 89 IRB banks on RWA for credit, market and operational risk. For IRB portfolios the information available is: EAD, RWA, EL, PD, LGD, maturity and share of defaulted assets.

[6] Defined as (RWA+12.5*Expected Loss)/EaD

Unfortunately, the latter studies are of little help to assess the magnitude of the RWA inconsistencies on a significant share of the banks' portfolio. Indeed, the Basel Committee and the European Banking Authority have focused on hypothetical or small portfolio exercises. On the contrary, national supervisors have carried out benchmarking exercises based on real portfolio composition and actual loan data. Gustin and Van Roy (2014) analyse the source of the differences across the four largest Belgian banks in risk-weighted assets. Using the Belgian Credit Register, they identified common counterparties of the four main banks, which were asked to report in an ad hoc survey the individual risk parameters. Using average risk parameters and actual loan data, the authors recomputed RWA which enabled them to find the exact drivers of RWAs. The dispersion in the values of the non-weighted risk parameters across the banks appears to be large. However, this dispersion declines when considering EAD-weighted parameters. This effect is particularly observable for the corporate portfolio, where the dispersion almost disappears for PDs and is reduced by one-third for LGDs. Therefore, giving more weight to large exposures and less weight to smaller exposures tends to reduce dispersion among EaD-weighted parameters. This could be explained by the fact that large corporates are less risky on average (lower internal ratings) and less diverse (in terms of dispersion in ratings) than smaller corporates. This also demonstrates that firms with lower estimated risk parameters tend to be granted, on average, larger loan amounts. In a second step, they find that significant dispersion of RWA/ EAD among the four banks does not appear to be significantly driven by the PD estimates, but rather by differences in estimated LGDs. Part of the variation across banks in LGDs derives from differences in collateral valuation, and in the ways in which collateral is integrated into internal models used to estimate LGDs. Finally, banks' modelling choices, such as the methodology for estimating downturn LGDs, also appear to drive some of the differences in LGDs.

On the same issue of the dispersion of risk parameters, Firestone and Rezende (2012) examine consistency in the estimates of PDs and LGDs for regulatory purposes in a sample of nine US banks. Using internal bank data on syndicated loans with PDs and LGDs assigned by several banks, the authors find significant dispersion in PDs, but the dispersion is not systematic. None of the banks assign PDs systematically higher or lower than others. On the other hand, banks differ systematically in their LGDs estimates and the sizes of discrepancy imply large differences in regulatory capital requirements. So, the question remains to know why results show systematic dispersion in the LGDs, but not in the PDs. The dispersion in risk parameters does not necessarily mean that banks' internal models are intentionally biased. However, it is worth to note that on portfolio with low default, data available to calculate loss given default are especially scarce, even scarcer than data available to calculate probability of default.

Our study complements Gustin and Van Roy (2014) and Firestone and Rezende (2012). We choose to focus on the portfolio of loans granted by French banks to large corporates – which the yearly turnover is above 50 Million Euros – operating in France. This choice was made for the following reasons. First, exposures on large corporates form the bulk of the exposure of French banks on the corporate sector.[7] Second, large corporates portfolios are low default portfolios in which RWA inconsistency if any are the more likely to exist. Third, multibank relationships – on which is based our analysis using common counterparties – are more prevalent in the large corporate portfolio.

[7] About 70% of the exposure to the corporate sector on a consolidated basis (COREP reporting) and 63% when considering corporate operating in France only (EBA 2014 Stress testing exercise)

3. Data

In a first step, we selected the non-financial corporate counterparties rated by the Banque de France in the National Credit Register for which at least one of five banking groups reported a positive exposure in the National Credit Register in the month of December from the years 2007 to 2011. In a second step, the five banks were surveyed to provide detailed data on risk parameters they used in their capital requirement computation (RWA, exposures, PD, LGD, maturity, CCF, EAD, off-balance sheet EAD…) for these exposures at counterparty level. Using the SIREN identifiers[8], we are able to identify common counterparties, i.e. corporates having an exposure towards at least two of the five banks (See Table 1, last column).

Table 1
Number of counterparties « large corporates » rated in AIRB, common counterparties and rate of answer

Banks	#1	#2	#3	#4	#5	Rate of answer	Nunber of corp.	Common counterparties
#1	2 852	706	231	552	1 464	92,2%	3411	1774
#2	706	1 069	162	313	696	94,9%	3361	907
#3	231	162	381	106	202	72,3%	4031	302
#4	552	313	106	908	572	97,7%	973	727
#5	1464	696	202	572	2 796	96,3%	3556	1759

Source: ACPR Survey on common counterparties 2011.

Note: 2 852 large corporates with a turnover greater than € 50 Million have been rated by bank 1 in AIRB. Among them, 706 have been rated by bank 2. Bank 1 has been asked to provide RWA for 3411 corporates: this information was provided only for 92.2% of corporates. Among these 3411 corporates, 1774 in the portfolio of bank 1 have also at least one other loan with another bank, so that one cannot add up the number of companies for a given row in the matrix on the left-hand side of the table.

Our analysis is focused on large corporates (with a turnover greater than EUR 50 Million) rated under the Advanced IRB (AIRB) so as not to make the comparison dependent on the Basel approach chosen (AIRB, Foundation IRB or standard approach).[9] The rate of answer[10] is quite high (between 72% and 98%). For instance, in 2011, bank #1 has a portfolio of 3411 corporates with a turnover greater than €50 million euros. Bank #1 has provided information on parameters for 92% of its counterparties; 2 852 of its counterparties are treated in AIRB. Table 2 below provides some descriptive statistics of risk parameters for the 5 banks: risk parameters are averaged (un-weighted average) at the bank level.

[8] The SIREN number is given by the French National Statistical Institute to businesses operating in France and reported in the National Credit register.

[9] Data on SME were also collected but excluded from the scope of this analysis.

[10] Defined as the ratio of number of counterparties for which banks have provided information over the number of corporates on which they had exposures in the Central Credit Register.

Table 2
Risk parameters and RWA rates for the banks on large corporates

	Mean	St-dev	Nb of Obs.	25th perc.	Median	75th perc.
PD (%)						
Bank #1	1,66	2,51	2 852	0,21	1,00	3,07
Bank #2	1,63	2,35	1 069	0,29	0,83	2,00
Bank #3	0,67	0,93	381	0,06	0,16	0,75
Bank #4	1,74	4,42	908	0,22	0,63	1,65
Bank #5	1,74	2,73	2 796	0,26	1,10	2,12
LGD (%)						
Bank #1	44	9	2 852	40	45	46
Bank #2	34	3	1 069	34	34	34
Bank #3	39	3	381	39	39	39
Bank #4	34	5	908	36	36	36
Bank #5	36	4	2 796	35	35	35
Maturity (in years)						
Bank #1	1,9	0,9	2852	1,2	1,8	2,3
Bank #2	1,6	0,9	1069	1,0	1,2	2,0
Bank #3	1,9	1,2	381	1,0	1,6	2,5
Bank #4	1,8	1,1	908	1,0	1,0	2,5
Bank #5	1,9	0,8	2796	1,0	1,8	2,5
(RWA/EaD) as reported by banks (%)						
Bank #1	79	47	2852	43	69	112
Bank #2	64	37	1069	34	60	90
Bank #3	48	35	381	20	36	73
Bank #4	59	31	908	37	52	75
Bank #5	66	39	2796	35	63	93
(RWA/EaD) as computed according to risk parameters provided by banks (%)						
Bank #1	79	47	2852	43	69	112
Bank #2	61	34	1069	35	59	83
Bank #3	48	35	381	19	36	73
Bank #4	57	34	908	30	49	76
Bank #5	66	39	2796	35	63	93

Source: ACPR Survey on Common Counterparties 2011.

Note: If a bank has several exposures on the same counterparty, the risk parameter is the mean of all the parameters of the different exposures. PD =probability of default. LGD = Loss Given Default. The sample is not restricted to common counterparties.

We notice that there are sizeable differences in terms of (RWA/EaD) between bank #3 (48%) and bank #1 (79%). Banks #2, #4 and #5 display similar levels at around 60%, which can be explained by comparable levels of PD, LGD and Maturity at the mean. The ratios (RWA/EaD) computed using average risk parameters provided by

banks and the ratios (RWA/EaD) as directly reported by banks are very close (except for bank #2).

Regarding risk parameters, there is a wider dispersion for LGDs rather than PDs and Maturity. For PDs, values at the mean are close to 1.7% for most of the banks with the exception of bank #3. The distributions of PDs are also similar with the same exception (bank #3). For the LGDs, values at the mean are in wide range from 34% to 44%. Distributions of LGDs are also very different across banks: bank #2 and bank #3 have a uniform LGD across the distribution. Bank #4 and bank #5 apply a uniform LGD on 80% of the exposures. By contrast, Bank #1 has a variable LGD ranging from 40% on the 25th percentile to 46% on the 75th percentile. Regarding average maturities, there are no strong differences: they are close to 1 for most of the banks.

As said in section 3, we focus our analysis on large corporates with a turnover greater than EUR 50 Million. However, such a threshold leads to a sample of large corporates which is quite heterogeneous, from very large corporates (with a turnover greater than 1 GEUR) to large SMEs (turnover greater than 50 Million Euros but below 100 Million Euros). Therefore, a simple comparison as made above in Table 2 does not control for the size of corporates. This might matter since the models used for very large corporates are more similar among banks than the models used for large SMEs. To correct for such bias, section 4.3 estimate whether or not risk parameters gaps are statistically significant by controlling for firm's characteristics.

4. Results

4.1. Difference of RWA rates across banks

Using the Basel risk parameters reported by banks in the survey and the exposures, we compute RWA rates (RWA/EaD) for each bank on the sample of its common counterparties e.g. we restrict our sample to counterparties having a multibank relationship (at least one exposure in two different banks). To take into account different exposures on the common counterparties, RWA rates are computed as a weighted average using the exposures as weights. We then compare bilaterally RWA rates in the Table 3 below which exhibits the difference of RWA rates between two banks.

Bank #1 is characterized by (RWA/EaD), which are around 20 percentage points higher than those of the other banks. In addition to bank #1, bank #5 has also a significant gap with the other banks, but the average gap of RWAs rates on common counterparties with other banks does not exceed 7 percentage points (when comparing bank #5 vs. bank #4). Other banks show a ratio of (RWA/EaD) relatively close to each other. If bank #3 is characterized by a ratio (RWA/EaD) always lower than those of its competitors, the difference never exceeds 5 points (except with bank #1, where the gap reaches 19 points). Except for two cases (bank #3 versus bank #5 and bank #1 versus bank #3), the bias to compare banks with respect to the mean computed on the whole set of their counterparties rather than with respect to the mean computed on the subset of their common counterparties is not very large (this bias is observable by comparing the number in each cell and the number in parenthesis in the table below). This means that the portfolio quality effect is not so important in explaining differences in RWA rates across banks.

Table 3
RWA rates gaps on a sample of common counterparties, RWA being computed using Basel parameters (in percentage points)

	Bank #1	Bank #2	Bank #3	Bank #4	Bank #5
Bank #1	0	20 (18)	19 (31)	23 (22)	16 (13)
Bank #2	-20 (-18)	0	5 (13)	4 (4)	-2 (-5)
Bank #3	-19 (-31)	-5 (-13)	0	-5 (-9)	-5 (-18)
Bank #4	-23 (-22)	-4 (-4)	5 (9)	0	-7 (-9)
Bank #5	-16 (-13)	2 (5)	5 (18)	7 (9)	0

Source: ACPR Survey on Common Counterparties 2011.

Note : Bank #1 has a RWA rate which is on average 20 percentage points higher than bank #2 on their sample of common counterparties « large corporate » under the AIRB approach. The numbers of common counterparties are presented in table 1. A bank could have different exposures on a given counterparty. In that case, we take as value of RWA the average value of RWA weighted by exposures amount. The difference in means of RWA computed for each bank on the whole sample (and not only on common counterparties) of its counterparties are reported in parenthesis.

4.2. The discrepancies among Basel parameters as sources of RWA rates gaps

To measure the contribution of the Basel parameters to the gaps of RWA rates, we compute "counterfactual" RWA rates considering each parameter separately.

To analyze the contribution of probabilities of default, for each firm that bank #1 holds in its portfolio, we compute the RWA rate we obtain when the PD applied by bank #1 is replaced by the mean of the PD applied by the competing banks over the same counterparty, the other Basel parameters being those retained by bank #1. Then, we compare this RWA rate with the rate which is computed using all bank #1' Basel parameters (e.g. using the PD applied by bank #1). The gap can be understood as resulting from the impact of the PD in the explanation of the RWA rates differences between bank #1 and its competitors. If this difference is negative, that means that bank #1 is more conservative in terms of RWA. Table 4 below reports the RWA rates gaps obtained from this "counterfactual" approach.

Table 4
Influence of parameters –PD, LGD and Maturity– on the RWA rates gaps

	Mean	St-dev	Observations	25th perc.	Median	75th perc.
			PD (%)			
Bank #1	-12	46	2 953	-35	-7	13
Bank #2	-10	35	1 877	-21	-5	9
Bank #3	8	38	701	-8	8	29
Bank #4	-5	38	1 543	-21	-2	14
Bank #5	-7	36	2 934	-27	-4	12
			LGD (%)			
Bank #1	-18	25	2 953	-27	-14	-5
Bank #2	9	19	1 877	1	4	14
Bank #3	-1	17	701	-6	-3	2
Bank #4	9	27	1 543	-1	2	14
Bank #5	7	21	2 934	-1	2	15
			Maturity (in years)			
Bank #1	-1	12	2 953	-7	-0	5
Bank #2	2	10	1 877	-1	2	8
Bank #3	-0	12	701	-5	0	6
Bank #4	1	11	1 543	-3	1	7
Bank #5	-1	10	2 934	-7	-1	3

Source: ACPR Survey on Common Counterparties 2011.

Note: -12 is the average of the differences between the RWA rate of the bank 1' counterparties to which the PD of different banking groups has been applied and the RWA rate used by bank 1. A negative difference means that the bank is more conservative (higher RWA) than its competitors on the set of their common counterparties.

Higher RWA rates due to a relative overestimation of PDs are significant for banks #1 and #2. For instance, applying to bank #1 and bank #2 the default probabilities of their competitors significantly lowers their average RWA rates, by 12 and 10 percentage points respectively. On the contrary, the low probabilities of default selected by bank #3 tend to lower its RWA rates by 8 percentage points relative to its competitors.

The impact of LGDs on RWA rates is the most sizeable for bank #1 but also exists for banks #2 and #5. Regarding bank #1, high values of LGDs explain the relatively high levels of bank 1's RWA rates. Had bank #1 applied its competitors' LGDs, its RWA rates would have been reduced by 18 percentage points. On the contrary, LGDs selected by bank #2 and #5 tend to increase their RWA rates by 9 percentage points relative to the other banks.

Regarding the impact of maturity on RWA rates, the low heterogeneity we observe in the descriptive statistics (see Table 1) explains their low discriminating power on RWA rates among banks. Thus, the slightly lower maturity of Bank # 2's exposures does explain only 2 percentage points of the decrease of RWA rates. Beyond this comparison exercise among banks, we checked the influence of the maturity parameter on RWA rates if we replace the maturity given by the « internal model » by a fixed maturity of 2.5 years. As a result, we noticed that RWA rates increased by 5 (Bank #3) to 8 percentage points (Bank #2)

4.3. Are RWA gaps statistically significant?

In this part, we check if the RWAs rate gaps among banks are statistically significant. To this aim, considering the sample of common counterparties, we run a regression of the Basel parameters – for instance, the PD - on bank and firm fixed effects. Because the parameter estimates of the regression are identified for a given firm borrowing to several banks, firm fixed effects allow to fully control for firm characteristics (for example, size, sector, profitability, etc…).[11] Exposures vary across the different pairs of bank-firm we can therefore test whether the RWA differences are driven by the size of the exposure.

We estimate the following model:

$$Reg_{e,b} = \alpha . \ln Expo_b + \gamma_e + \delta_b + \varepsilon_{e,b} \quad (1)$$

Where γ_e represents the fixed effect for firm *e* and δ_b is the fixed effect for bank b. $Expo_{e,b}$ is the amount of the exposure of the bank b on firm e. $\varepsilon_{e,b}$ is the error term. Reg = PD, LGD, MAT, RWA.

[11] Firm fixed effects enable to control for firm size; there is therefore no need to estimate the regressions by type of turnover.

Table 5
Discrepancies among Basel parameters: a regression model

Parameters	PD	LGD	MAT	RWA
Exposure (in log)	-0.05***	0.06	0.05***	-0.43**
	(0.014)	(0.040)	(0.006)	(0.201)
Bank # 2	-0.09	-10.66***	-0.29***	-16.78***
	(0.055)	(0.156)	(0.022)	(0.780)
Bank # 3	-0.57***	-5.73***	-0.03	-23.02***
	(0.084)	(0.236)	(0.033)	(1.179)
Bank # 4	0.04	-10.41***	-0.20***	-20.33***
	(0.060)	(0.169)	(0.023)	(0.845)
Bank # 5	-0.04	-8.92***	0.01	-17.01***
	(0.047)	(0.131)	(0.018)	(0.654)
Bank # 1 (reference=0)				
Observations	9911	9911	9911	9911
R-squared	0.646	0.630	0.563	0.714

Source: ACPR Survey on Common Counterparties 2011.

Note: Each parameter is regressed using firms and banks fixed effects. Bank # 1 serves as reference. The sample is the common counterparties' sample. Standard-deviations are in parentheses. The 1, 5 and 10% confidence levels are represented respectively by ***, ** and *. Bank # 3 shows an average PD significantly different from bank # 1's PD (as reference) by -0.51. The estimates of the regression model are identified on a same firm with exposures on several banks. Therefore, one takes into account firm's characteristics in the comparison of Basel parameters.

All banks show RWAs significantly lower than bank #1 with a difference between -16 and - 23 percentage points. Bank # 2 and bank # 4 display significant different maturities. Only bank # 3 presents PDs significantly different from the other groups. LGDs are significantly different among all groups. The size of the exposure plays a lowering effect on the default probability and on RWAs. An exposure's increase of 10% lowers RWAs by 4 percentage points (see Table 5).

Statistical tests allow comparing pairs of banks. For instance, the RWAs of banks #5 and #2, and to a lesser extent, RWAs of banks # 4 and # 3 are not significantly different. However the RWA of the group of the banks # 5 and # 2 are different from the RWA of the Group of the banks # 3 and # 4 (see Table 6).

Table 6
Comparison of RWA – significant differences

	Bank #1	Bank #2	Bank #3	Bank #4	Bank #5
Bank #1	1	0	0	0	0
Bank #2	.	1	0	0	0.34
Bank #3	.	.	1	0.041	0
Bank #4	.	.	.	1	0
Bank #5	.	.	.	.	1

Note: Each parameter is regressed on dummies for firms and banks. Bank # 1 is taken as reference. The sample is the common counterparties' sample. This table presents the probability to reject wrongly the hypothesis of RWA equality between bank A and B. Line 1 indicates that the probability is close to 0, so that the model rejects the hypothesis of equality of all banks with bank # 1.

4.4. How to explain the observed heterogeneity in Basel risk parameters for the same sample of counterparties?

As said in Schuermann (2004), the three key issues surrounding the computation of LGDs are the following: definition and measurement of default and losses, bank policy for key drivers and modelling and estimation approaches. These three key issues can explain the observed heterogeneity in LGDs.

Among the key drivers, collateralisation may explain a part of the LGD variation across the sample of common counterparties. In the large corporate portfolio of banks, a portion of the secured exposure, which differs across banks, is collateralised. Recovery rate tends to be higher (i.e. LGD tends to be lower) when the value of collateral is higher. Among banks, the methods to evaluate the value of collateral and to incorporate it in the modelling of LGDs can be different which then can potentially give different level of LGDs for the same exposures. Apart from collateralisation, other drivers can also play a role. For instance, the estimation of losses for the same exposure can vary among banks. Indeed, this estimation depends on the banks' effectiveness in the recovery process, the length of time considered for the recovery process, the discount rate used in the computation and the recovery costs considered.

At last, the regulatory provision[12] to add margins of conservatism to the parameters, in order to cover the expected range of estimation errors, may also be an explanatory factor of this dispersion, as well as the calculation of downturn LGD: the level of conservatism may differ among banks because of expert judgments.

[12] Cf. Art. 179 CRR: "*an institution shall add to its estimates a margin of conservatism that is related to the expected range of estimation errors. Where methods and data are considered to be less satisfactory, the expected range of errors is larger, the margin of conservatism shall be larger*".

5. Conclusion

In this article, we analyse the dispersion of RWs for five French banks based on common large corporate counterparties and we try to identify the sources of RWs dispersion among these banks. The analysis is based on detailed data on risk parameters collected through an ad hoc survey sent to banks with a cut-off date at end-2011. Since the comparison was done on identical counterparties, we are able to compare risk parameters on the same basis.

We show that for PDs, all the banks except one exhibit broadly similar levels at the median. For LGDs, there is wider dispersion with different practices: some banks apply a constant LGD while other banks apply varying LGDs depending on the characteristic of the counterparty. In a second step, after controlling for different loan exposures (i.e. using same parameters for similar firms), we find some dispersion on RWA rate (RWA/EaD) among the selected banks in particular for one bank. An interesting result is that this dispersion is due to differences in LGDs and to a lesser extent to differences in PDs. The differences in LGDs across banks could be linked to differences in methodologies for the computation of LGDs. However, one has to bear in mind that the results are based on data with a cut-off date at end-2011 and that the dispersion found on LGDs might have declined more recently.

Our results can offer interesting insight in the current debate concerning the role of the IRB approach and how to adapt this approach, which still have some advantages. Our results show that there is a wide dispersion in LGDs across banks and that the differences in LGDs are important determinants of differences in RWs. This may be related to banks' diversity in the computation of LGDs in particular regarding the collateralisation and the recovery processes but also to the possible addition of heterogeneous margins of conservatism to cover the expected range of estimation errors or for the calculation of downturn LGD. If we think that the differences in LGDs are unwarranted, it could be considered to increase harmonization in LGD calculation with more focus on the supervision and more rules on the methodologies used to compute LGDs. Therefore, in the debate around the role of the IRB approach, this article suggests that instead of eliminating the AIRB approach for large corporates, the current framework should be adapted to restore confidence in internal models.

Both regulators and the banking industry have launched reflections on this issue in different fora. The Basel Committee on Banking Supervision (BCBS) is considering measures to reduce unwarranted variation in risk-weighted assets between banks (BCBS, 2014). These measures include inter alia reducing the modelling choices in the capital framework when determining internal-model based estimates of credit risk-weighted assets. On the banking industry side, the International Institute of Finance RWA Task Force has also undertaken an in-depth analysis of banks' modelling practices regarding internal models, including the formulation of detailed recommendations in the same vein.

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