

A Work Project, presented as part of the requirements for the Award of a Master Degree in Finance from the NOVA – School of Business and Economics

**CAPITAL REQUIREMENTS AND RISK WEIGHTED
ASSETS ANALYSIS OF PORTUGUESE BANKS
WITH COMPARABLE EU BANKS**

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A Project carried out on the Masters in Finance course, under the supervision of:

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January 2019

I would like to thank my advisor Filipa Castro for her availability and support and also my coworkers from EY for their flexibility and knowledge sharing, particularly Rodolfo Pinto, Artur Côtó, Leonor Peleja and Rita Costa.

I dedicate this work project to my parents, sister and all the professors that I had during my academic journey due to their support, dedication and inspiration in contributing to the person that I am today. I really appreciate from the bottom of my heart all that you did for me ever since I joined Jardim Escola João de Deus 20 years ago.

Last but not least, I would like to acknowledge the motivation and trust that my grandparents, uncles, aunts, cousins and friends put on me – amongst many others, thank you Mariana, Mafalda, Cátia, Rita, Pedro, Bernardo, António, Vasco, Filipe, Paulo, Gonçalo.



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Abstract

Departing from an extensive period of financial instability across the European banking industry, this work aims to study the capital adequacy of six major Portuguese Institutions. Portuguese Banks were divided in two different sets according to their size and 60 EU banks allocated according to their RWAs proximity. Despite complying with the minimal capital requirements and attaining in recent year an enhancement in the capital ratio higher than their peers, Portuguese Banks are still considerably undercapitalized. Contrarily to abroad, instead of a rise in own funds the catalyst was an expressive reduction of the RWAs from Credit Risk.

Key words: Banks; Portugal; Capital Requirements, Risk Weighted Assets; Credit Risk

1. Research Question

In order to comply with the objectives of the Direct Research Internship standard track, the work project addresses a business research question of interest for the company where the internship occurs. Having started working in risk management on the Financial Services Advisory department of EY Portugal, the banking industry is a sector of major interest. EY, formerly known as Ernst and Young, is a multinational corporation founded in 1989 as a consequence of the merge of two accountancy firms, Ernst & Whinney and Arthur Young & Co. With a workforce of 261 thousand employees it accomplished 34,8 billion dollars of global revenues in 2018 fiscal year. Similarly to the remaining “Big Four”, Assurance and Advisory at EY comprise the main source of revenue.

To successfully respond to the increasingly complexity of the Financial Services clients’ needs, EY disintegrates the professionals of this industry from the remaining ones across all service lines. Consequently, cooperation and efficiency are enhanced and employees have the opportunity to emphasize their know-how on a demanding industry with a systemic role in the overall economy. Given a regulatory framework in transformation and the increasingly complexity of its processes and methodologies, a study which addresses the current context of prudential supervision in respect to the effectiveness of banks in managing their capital is of foremost importance for the FSO Advisory department at EY Portugal.

The business research question to be considered has taken into account that banks, apart from complying with the regulatory requirements, must also gather a sense of assessment with their peers. Therefore, “How homogeneous are Portuguese banks in respect to their compliance with Capital Requirements and their Risk Weighted Assets in respect to EU banks with comparable exposure value of Credit Risk?” is the question that will be targeted with this study. However, to gather a sense of appraisal it is of necessary to start with an assessment of the regulatory framework throughout time and the extrapolation of forthcoming reforms.

2. Regulatory contextualization

Despite the benefits associated with the banking system, not always have our ancestors been able to take them for granted with the same acceptance as of today. Europe was Christian and the Bible strictly forbidden usury, “do not charge your brother interest on money, food, or any other type of loan” (Deuteronomy 23:19). In this sense, despite only having flourished in more recent centuries, banks exponential development progressed into what has become today a fully integrated global financial system.

By applying fractional reserves institutions create money when they conceive loans since they are not required to preserve 100% of the capital received from deposit liabilities. As the 2008 financial crisis validated, during periods of financial and economic difficulties the proliferation of negative externalities from banks in distress to the economy is enhanced. With people’s perception of the industry being deteriorated even institutions with a respectable financial strength may face complications. On the prospect of a bank run the possibility to clear demand by applying a policy of withdraws below par does not exist. In this sense, sound liquidity risk management with controls for maturity mismatches is essential to ensure that banks have the necessary means to honour their compromises.

Theoretically, it is inconsistent to assure with absolute certainty that money is available on demand under any circumstances. Nonetheless, several systemic mitigation techniques exist to increase trust on the financial system. In comprehensive terms, regulation assures transparency and sets the capital adequacy requirements. Central banks act as a lender of last resort to protect the aggregate money supply and deposit insurance systems assure that in case of bankruptcy depositors’ money is secured until a certain threshold. Despite the benefits associated with these practices, both government bailouts (Lammertjan Dam, Michael Koetter, 2012) and deposit insurance systems (Apanard Angkinand, Clas Wihlborg, 2010) increase bank’s moral hazard in respect to their risk management practices.

When it comes to the origins of the current global regulatory framework the first steps occurred in 1930 with the foundation of the Bank for International Settlements (BIS). Nevertheless, it was only in 1974, three years after the fall of the Bretton Woods System, that the Basel Committee on Banking Supervision (BCBS) was created as a medium of recurrent debate for international banking supervision. Its ultimate goal was to enhance international stability with the improvement of the quality and homogeneity of banking regulation.

In July 1988, with the publication of the *International convergence of capital measurement and capital standards*, also known as the Basel Accord, a weighted approach to the measurement of risk ought to be complied with. Capital was divided in Core Capital or Tier I and Supplementary Capital or Tier II. To measure Credit Risk assets were divided into five categories and a common Risk Weight to each category was attributed based on the nature of the debtor. To lessen the impact of unexpected losses on banks solvency, institutions were required to set aside at least 8% of their capital in respect to the sum of their Risk Weighted Assets (RWAs).

In January 1991, the risk of loss from adverse market movements, either from general risk or specific risk, was developed with the publication of the *Amendment to the Capital Accord to Incorporate Market Risks*. Under this document banks were required to set capital aside to account for exposures to foreign exchange, traded debt securities, equities, commodities and options. Despite being the first time that internal models were allowed, institutions had to acquire authorization from the regulatory entity for its usage.

In June 1999, with the acknowledgment of banks insufficient risk management practices and the growing mismatch between financial innovation and the capital requirements framework, the BCBS issued a new proposal to rectify previous limitations. Therefore, in June 2004 Basel II introduced under the document document an *International Convergence of Capital Measurement and Capital Standards: A Revised Framework* a comprehensive three

pillar approach which is still in force as of today and whose purpose was to enhance the economic stability of the financial system.

The first pillar contains the quantitative rules for determining the capital requirements that banks must comply with. Operational risk, the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events, was added to the denominator and instead of a single rudimentary technique for Credit Risk, three approaches which will later be scrutinized in more detail could now be used (i.e. Standardised Approach, Internal Rating Based Approach and Foundation Internal Rating Based Approach).

The second pillar refers to the supervisory review process. By strengthening the monitoring procedure of capital adequacy, it became a complement to the first pillar as rules by themselves are not sufficient without enforceability. Therefore, supervisors review and evaluate banks processes and strategies in respect to capital adequacy and ensure their compliance with the regulatory capital ratios. If results are deemed unsatisfactory, supervisors may act to mitigate the possibility of further departures from the appropriate requirements and practices.

The third pillar is complementary to the previous two and consists in the practice of financial reporting to enhance market discipline. Under this framework institutions are required to comply with substantial disclosures in respect to the scope of application, capital structure, capital adequacy, risk exposures and risk assessment processes. By increasing the capability of markets participants to monitor banks, investors will be able to respond more efficiently to financial health deterioration and penalize institutions whose risk management is perceived as suboptimal. Thus, not only comparability and transparency are enhanced but managers will also have further incentives to lead institutions towards higher standards of corporate governance.

In the sequence of the economic and financial crisis of 2007/2008, the BCBS initiated an on-going set of reforms to the regulatory framework under the name Basel III. With several

documents and respective amendments being published through the years, its completion only occurred in December 2017 with the publication of *Basel III: Finalising post-crisis reforms*. The main resolution of the Accord was to implement further enhancements to the three pillars approach. Amongst others it introduced new capital buffers, divided Tier I in two components, revised the Standardised approach across different types of risk, implemented an output floor to the capital benefits from internal models, introduced a leverage ratio, liquidity coverage ratio and net stable funding ratio. As legislators still need to transpose to European Law some of the reforms from Basel III, forthcoming alterations to current regulatory framework that Portuguese banks are subject to (i.e. *Capital Requirements Regulation* and *Capital Requirements Directive IV*) are expected. To conclude, Basel Accords constitute minimum requisites and it is up to jurisdictions to decide if they should go further beyond them.

3. Data and Methodology

The data used for the analysis of banks capital requirements, own funds and RWAs within the European Union relies significantly on the public available data from EU-wide transparency exercise. This set of information is gathered from institutions supervisory reports and is published annually on a consolidated basis on the European Banking Authority website.

The database comprises information of 130 banks across 25 countries, with five out of those being from Portugal. Performed the first time in 2011, the most recent publication refers to the 2018 exercise and covers information referent to 31 December 2017 and 30 June 2018. Notwithstanding the possibility of investigating for prior years, most of the study will be focused on data from the first semester of 2018 and past information will only be considered when relevant for the study conducted. Since not all the information necessary for the analysis is present on the EU-wide transparency exercise, the retrieval of information from bank's financial statements and market discipline reports was also conducted.

When it comes to the determination of clusters, the selection criteria rely solely on institutions' RWAs as this value is the predominant factor which defines the amount of regulatory capital that a bank needs to hold to operate. Therefore, Caixa Geral de Depósitos, Banco Comercial Português and Novo Banco were benchmarked to a group of banks with higher RWAs. Contrarily, Banco Português de Investimento, Caixa Económica Montepio Geral and Caixa Central de Crédito Agrícola Mútuo were assigned to a cluster with lower RWAs. Tables 1 provide a summary of the full list found in Annex 1 in respect to the 30 foreign banks allocated to each cluster based on their proximity to the average RWAs of Portuguese institutions. Therefore, Cluster Large has an average RWA of €40 268M, a standard deviation of €9 7057M and a coefficient of variation of 24,2%; whereas Cluster Small has for the same components €13 605M, €5 097M and 37,5%.

Tables 1: RWAs of banks from Cluster Large and Cluster Small

Cluster Large	RWAs	Cluster Small	RWAs
Caixa Geral de Depósitos	49 872	Banco Português de Investimento	16 882
Banco Comercial Português	41 793	Caixa Económica Montepio Geral	11 259
Novo Banco	32 287	Caixa Central Crédito Agrícola Mútuo	8 909
Peers Average	40 268	Peers Average	13 605

4. Capital Requirements and Own Funds

As previously mentioned, for banking intuitions to legally operate within a jurisdiction they need to conform with certain thresholds of regulatory capital to absorb the impact of unexpected losses and secure solvency during periods of distress. Under the current paradigm, Portuguese banks need to comply with capital adequacy standards from the *Capital Requirements Regulation*, additional buffers from the *Capital Requirements Directive IV* (i.e. Systemically Important Institutions, Capital Conservation and Countercyclical Capital buffers) and pillar 2 capital requirements.

In respect to Article 92 of the *Capital Requirements Regulation*, banks are required to fulfil a minimum Common Equity Tier 1 ratio of 4,5%, a Tier 1 ratio of 6% and a total capital ratio of 8%. Since all the remaining capital requirements subsequently presented need to be fulfilled with Common Equity Tier 1 capital, differences between ratios arise from these values.

According to EBA’s 2018 listing, there were no Portuguese institutions amongst the 36 assigned as Global-Systemically Important Banks. Even though under these circumstances the G-SIB conservation buffer is not applicable, Bank of Portugal may enforce additional capital requirements between 0% and 2% to Other-Systemically Important Institutions to mitigate eventual externalities from their enhanced dimensions:

Table 2: O-SII buffer applicable to Portuguese Banks as a percentage of total RWA

	2018	2 019	2020	2021
Caixa Geral de Depósitos	0,25%	0,5%	0,75%	1%
Banco Comercial Português	0,188%	0,375%	0,563%	0,75%
Novo Banco	0,125%	0,25%	0,375%	0,5%
Banco Português de Investimento	0,125%	0,25%	0,375%	0,5%
Caixa Económica Montepio Geral	0,063%	0,125%	0,188%	0,25%

Introduced in 2016 through a phased-in approach which started at 0,6%, the Capital Conservation buffer was 1,25% in 2017, 1,875% in 2018 and will reach its ceiling value of 2,5% in 2019.

The Countercyclical Capital buffer is a macroprudential tool which may increase banks’ capital requirements until a threshold of 2,5%. Theoretically, it should be augmented by regulators during periods of economic growth and subsequently lowered during distress situations. According to the European Systemic Risk Board, 6 out of 30 European countries are currently applying this buffer, ranging from 1% to 2% and attaining an average of 1,42%.

When it comes to pillar 2 capital requirements attributed annually to each institution, the ratio will differ according to the results descendant from the Supervisory Review Evaluation Process. The methodology for its applicability is based on the principle of proportionality and

apart from accounting for banks dimension, systemic importance and the complexity of its operations, also relies on an assessment analysis of business model, internal governance, risk management, risks to capital, liquidity and funding. For the year 2018 Caixa Geral de Depósitos, Banco Comercial Português and Banco Português de Investimento were required to comply with a ratio of 2,25% and Caixa Económica Montepio Geral of 3%.

Table 3 summarizes the capital requirements for each Portuguese bank for 2019. Pillar 2* requisites for Novo Banco and Caixa Central Crédito Agrícola Mútuo are assumed to be 2,5% and for the reminiscent banks the values from 2018 are expected to remain constant for the following year.

Table 3: 2019 capital requirements for Portuguese Banks

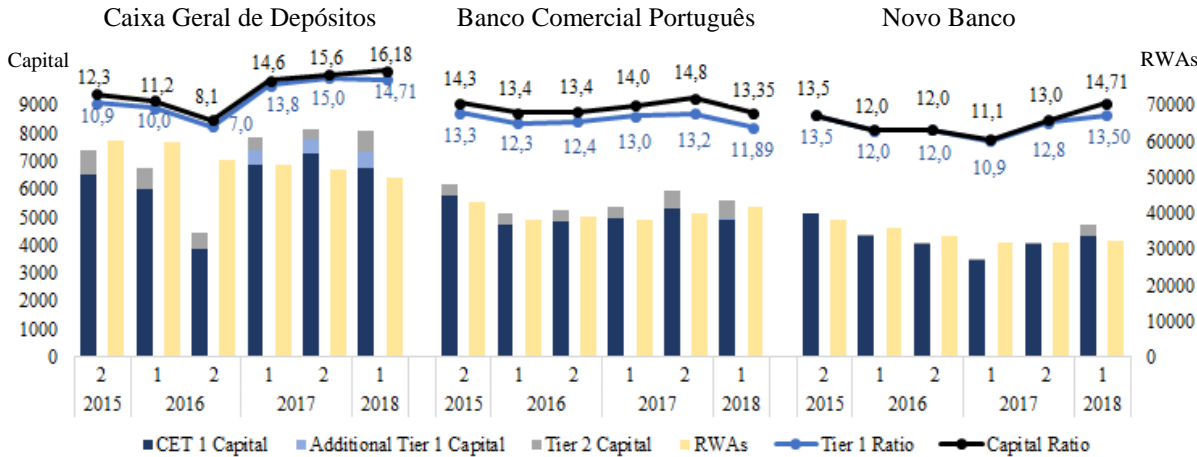
	Caixa Geral de Depósitos	Banco Comercial Português	Novo Banco	Banco Português de Investimento	Caixa Económica Montepio Geral	Caixa Central Crédito Agrícola Mútuo
Pillar 1	4,5%	4,5%	4,5%	4,5%	4,5%	4,5%
Pillar 2*	2,25%	2,25%	2,5%	2,25%	3%	2,5%
Buffer O-SII	0,5%	0,375%	0,25%	0,25%	0,125%	0%
Buffer Count.	0%	0%	0%	0%	0%	0%
Buffer Cons.	2,5%	2,5%	2,5%	2,5%	2,5%	2,5%
CET1 Ratio	9,75%	9,625%	9,75%	9,50%	10,125%	9,5%
Tier 1 Ratio	11,25%	11,125%	11,25%	11,00%	11,625%	11%
Capital Ratio	13,25%	13,125%	13,25%	13,00%	13,625%	13%
2020 increase	0,25%	0,188%	0,125%	0,125%	0,063%	0%
2021 increase	0,25%	0,187%	0,125%	0,125%	0,062%	0%

Having defined the minimum capital requirements that Portuguese institutions must comply with in 2019, it is crucial to distinguish the main components of own funds before assessing their evolution throughout time (Graphs 1 and 2). According to the *CRR*, for regulatory purposes the total amount of eligible capital corresponds to the sum of Tier 1 and Tier 2 instruments after deductions and adjustments, with the first being divided in either Common Equity Tier 1 (CET 1) and Additional Tier 1 (AT 1).

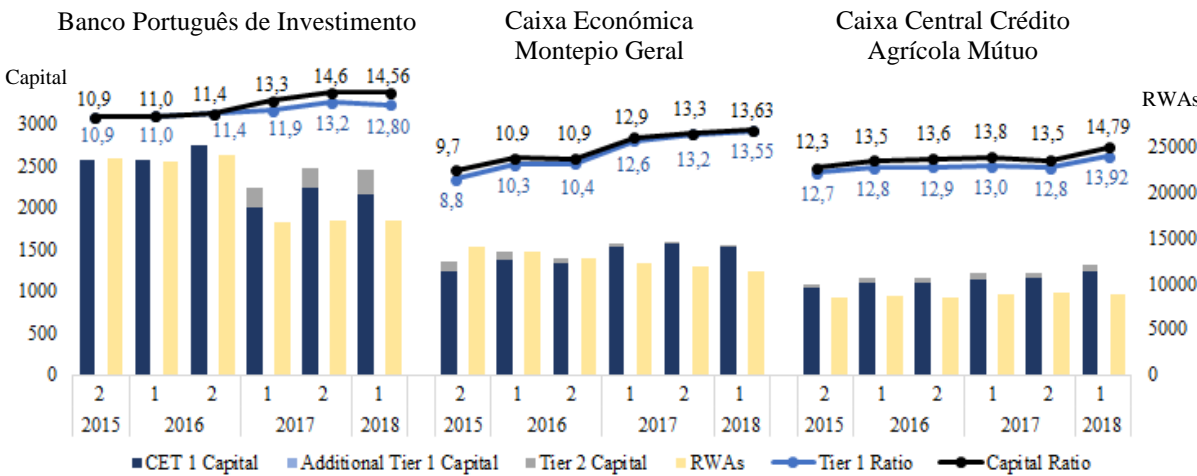
Also referred to as core capital, Common Equity Tier 1 is the main source of funding for institutions to cover their RWAs exposures and its two major constituents are common

shares and retained earnings. Apart from accounting for accumulated other comprehensive income and other reserves, several deductions such as those referent to intangible assets, benefit pension funds and deferred tax assets contingent to future profitability must be considered. Additional Tier 1 are capital instruments without a fix maturity which have seniority over CET 1 but are subordinate to Tier 2. Noncumulative perpetual preferred stocks and certain Contingent Convertible hybrid instruments, also known as CoCos, can be considered under strict conditions as AT 1. To conclude, Tier 2 capital or supplementary capital is limited to 100% of Tier 1 and is not as consistent as the former categories. Its major components are subordinated loans and several hybrid instruments which amongst other requirements may not be redeemable within 5 years of their issuance date.

Graphs 1: Evolution Capital, RWAs and respective ratios of Large Portuguese Banks



Graphs 2: Evolution Capital, RWAs and respective ratios of Small Portuguese Banks



From the graphs presented it is possible to grasp the evolution of Portuguese banks regulatory capital, RWAs and the resulting ratios from the second semester of 2015 to the first semester of 2018. In June 2018, all banks are in compliance with the capital requirements for the subsequent year, being on average 1,33 percentage points above the minimum capital ratio requisites, this is the ratio that institutions are closer to not complying with.

As observable, with an average of 90,8% CET 1 capital represents the majority of own funds, ranging from 84,1% to 99,2% of their total. Despite several banks in Portugal having resorted to CoCos to finance themselves during the financial crisis, only the €500M perpetual AT1 issuance from Caixa Geral de Depósitos in June 2017 at a rate of 10,75% is a regulatory eligible position. Opposite to the 1,4% from AT 1, Tier 2 comprises on average 7,8% of institutions own funds and the rate at which banks can finance themselves in respect to this tier is a comparable and foremost indicator of the perceived financial health by investors.

Table 4: Most recent Tier 2 capital funding's by Portuguese banks since 2017

Bank	Amount	Rate	Annual Cost	Issuance	Maturity
Caixa Geral de Depósitos	€500M	5,75%	€28,75M	03/2018	03/2028
Banco Comercial Português	€300M	4,5%	€13,50M	12/2017	12/2024
Novo Banco	€400M	8,5%	€34,00M	06/2018	06/2028
Banco Português de Investimento	€300M	Euribor 6m + 5,74%	€20,22M	03/2017	03/2027

Annual Costs does not account for tax shield (Annual Cost = Amount * Rate) and Euribor was assumed to be 1%

Even though the outcomes presented on Graphs 1 and 2 follow each year's regulatory framework, the *CRR* determined a phased-out period for certain unclassified items and a phased-in approach for capital deductions. Accordingly, the CET 1 values obtained were higher than those under a fully implemented methodology by 20,1% in 2015, 21,5% in 2016, 8,5% in 2017 and 5,5% in 2018. If instead of phased-in the fully implemented approach was considered, the capital ratios would have been slightly lower than those attained, particularly in 2015 and 2016. If accounted for this factor the overall deterioration of own funds until December 2016 and the subsequent improvement from that date onwards would be even more preponderant.

Table 5: Phased-in Capital Ratio percentage points variation per semester from 2016 to June 2018 and average total variation of its Own Funds and RWAs (Annex 3 with Portuguese Banks)

Capital Ratio Variation	Capital Ratio						Own Funds	RWAs
	2016/06	2016/12	2017/06	2017/12	2018/06	Total		
Large Banks Portugal	-1,16	-1,03	2,06	1,21	0,30	1,38	-2,9%	-12,1%
Cluster Large	0,25	0,36	0,08	0,24	0,07	0,93	5,7%	0,3%
Small Banks Portugal	0,71	0,14	1,40	0,42	0,54	3,21	10,1%	-14,3%
Cluster Small	0,20	0,94	0,36	0,22	0,39	2,11	11,1%	1,8%

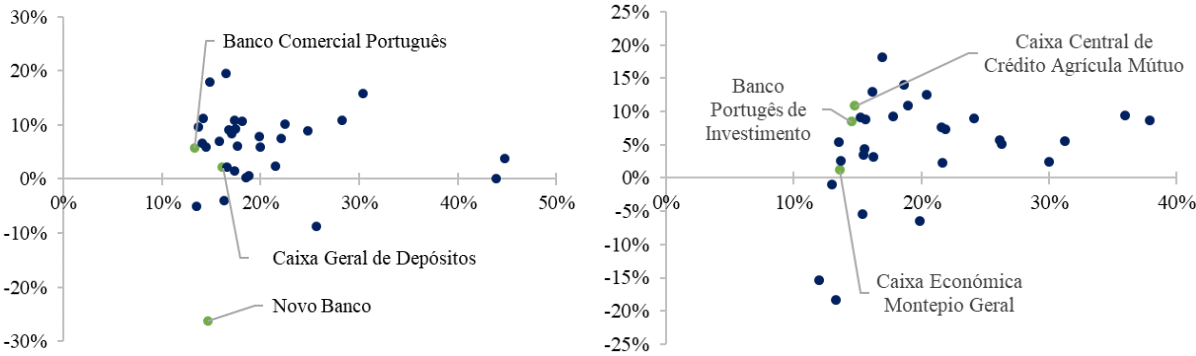
Over the period being considered the enhancements in Portuguese banks' capital ratio was attained due to a significant decrease in RWAs in conjunction with a moderate growth of own funds by 3,6%. In respect to the mean values for their peers, whereas RWAs increased slightly in both clusters, the preeminent enhancement of own funds by 5,7% in Cluster Large and 11,1% in Cluster Small lead the capital ratio to surge over the last three years. Notwithstanding a lower own funds growth, the improvements on the capital ratio were on average higher in Portugal due to an outweigh of the denominator component. Additionally, either in Portuguese banks or abroad the enhancements were on average higher in smaller banks than in larger institutions.

When compared to the 130 banks from EBA's transparency exercise, in June 2018 Portuguese institution fell substantially behind in terms of capital adequacy. As a result of several outliers, the overall average capital ratio of 24,3% is reasonably disconnected from the median percentile of the industry (25th = 16,2%; 50th = 18,6%; 75th = 23,3%). The average Portuguese CET1 ratio of 13,2%, Tier 1 ratio of 13,6% and capital ratio of 14,5% correspond respectively to the 23rd, 17th and 11st percentiles. In this sense, whereas Portuguese institutions have a 0,2 percentage points difference from CET 1 to Tier 1 ratios and of 1,1 from Tier 1 ratio to the capital ratio, the values for the industry are correspondingly higher at 1,3 and 2,7. Thus, it is not only possible to infer lack of capital for Portuguese banks but also in terms of their diversification through the usage of AT 1 and Tier 2 capital instruments, particularly in smaller institutions. Notwithstanding the the slightly lower values, both conclusions still hold true if

banks from the two clusters were used on the comparison analysis instead (CET 1 ratio of 17,5%, Tier 1 ratio of 18,2% and capital ratio of 20,3%).

Given the capital increases that occurred in recent years it is not unconceivable to assume that equity holders would not be willing to raise further amounts of capital unless it becomes strictly necessary to do so in order to fulfil the minimum capital requirements. Having into consideration Portuguese banks' proximity to the thresholds this is a scenario that should not be disregarded. Alternatively, if managers decide to raise capital through regulatory eligible debt that contrasts with equity where dividends may be non-existent during adverse situations, the cost of debt will have an annual negative impact on institutions income statement. Consequently, the increase in debt related expenses would diminish the ability of Portuguese banks to enhance own funds through retained earnings (Table 5).

Graphs 3: Profitability of Portuguese Banks in respect to peers (x = Capital Ratio; y = Net Income / Own Funds)



Net Income: Annualized results from Jan 2017 to June 2018
 Capital Ratio & Own Funds from June 2018

From the graphs it is possible to infer that the profitability of Portuguese banks from Cluster Large is still unsatisfactory when compared to their peers, particularly in respect to Novo Banco whose negative results may force him to plea further amounts of capital from the resolution fund. In respect to Cluster Small, Caixa Económica Montepio Geral is the bank which may face higher probabilities of having to raise further amounts of capital due to its low profitability aligned with the non-existent margin of safety from the minimal requisites. Despite having been profitable concerns from lack of margin also apply to Banco Comercial Português.

To conclude, before conducting the analysis of Risk Weighted Assets it is worth remarking that Portuguese banks comply with the minimum capital requirements of 3% for the leverage ratio, which relates Tier 1 capital to the sum of banks assets and off-balance sheet exposures. In June 2018 the leverage ratio in Portugal ranged from 6,6% to 8,8% and its mean value of 7,6% is in line with the average ratios from their peers. (Annex 3 with complete list)

5. Risk Weighted Assets

The Risk Weighted Assets are the denominator component of the solvency ratio and therefore a preponderant factor when determining banks' capital adequacy. In June 2018 Portuguese banks reported a mean amount of €26 884M which corresponds to nearly 7 times the amount of own funds. Having remained relatively steady in the previous two semesters, RWAs declined on average 13,2% over the past three years, with Caixa Central de Crédito Agrícola Mútuo being the only Portuguese institution contradicting the negative trend. Opposite to Portugal, with an equivalent proportion of increases and decreases banks from Cluster Large and Cluster Small attained a mean increment of 0,3% and 1,8% of their RWAs, respectively.

Table 6: Distribution of RWAs across types of risk in June 2018

	Credit Risk	Market Risk	Operational Risk	Other Risks
Caixa Geral de Depósitos	86,9%	3,6%	7,7%	1,8%
Banco Comercial Português	86,7%	4,4%	8,6%	0,4%
Novo Banco	88,1%	2,6%	4,6%	4,7%
Cluster Large	88,0%	2,4%	7,9%	1,8%
Banco Português de Investimento	84,4%	7,0%	8,5%	0,1%
Caixa Económica Montepio Geral	87,8%	0,8%	6,4%	5,0%
Caixa Central de Crédito Agrícola	86,7%	0,4%	12,3%	0,6%
Cluster Small	86,5%	1,8%	9,3%	2,4%

Credit Risk is the preeminent component of RWAs and according to the evolution of the reminiscent types of risk, it was the catalyst for the Portuguese reductions to the capital ratio over the past 3 years. There is a significant alignment across Portuguese banks' exposure to Credit Risk and the average weight of 86,8% is in line with the mean value from both clusters.

When it comes to Market Risk, even though the exposures in Caixa Económica Montepio Geral and Caixa Central de Crédito Agrícola represent less than 1% of the total RWAs, the reminiscent Portuguese banks reported higher values than their peers' means, particularly Banco Português de Investimento with 7,0%. Arising from adverse market movements in interest rates, foreign exchanges, equities and committees, this type of risk is approximately two and half times lower than the average of 8,0% from Operational Risk, which according to its definition arises from inadequate or failed internal processes, people and systems or from external events. Whereas Portuguese banks have an overweighed position in Market Risk, the exposure to Operational Risk is underweighted when compared to their peers. Opposite to what occurred in the previous two risk categories, the exposure to Operational Risk is on average higher in smaller banks than in larger institutions, both for Portugal and the industry. The values for Other risks possess a minor significance on institutions overall RWAs and except for Novo Banco and Caixa Económica Montepio Geral they are smaller in Portugal than abroad.

5.1. Credit Risk

According to the *Capital Requirements Regulation* banks may compute Credit Risk either recurring to the Standardise approach or the Internal Ratings Based approach, with the latter being divided in the Foundation IRB and Advanced IRB. The Standardised approach resorts to external credit ratings as a mean to allocate Risk Weights to exposures according to the level of risk associated with a position. Alternatively, the IRB approach requires the use of four parameters to determine the final risk exposure: Probability of Default (PD), Loss Given Default (LGD), Exposure at Default (EAD), and Maturity (M). Under the Foundation IRB banks obtain permission to determine the PD by themselves and must use regulator's exogenous values for the remaining constituents. Contrary, the more flexible Advanced IRB refers to situations where institutions are given authorization by the competent authorities to develop their own internal models for the computation of the PD, LGD and EAD.

From EBA's consolidated exercise the dataset can be arranged to attain the Original Exposure, Exposure Value and Risk Exposure by class of risk, with the latter corresponding to the final RWAs from Credit Risk. In this sense, the Exposure Value refers to the Original Exposure of an asset after accounting the effects of credit conversion factors and credit risk mitigation techniques. The first refers to the prospect of banks off-balance sheet exposure being transferred to the balance sheet (Annex 4), the second to mitigation techniques such as funded and unfunded credit protections which diminish the risk associated with the position being collateralized or guaranteed. Due to limitations in the dataset only the multiplier from their aggregate impact can be attained and for simplicity reasons it was named "CCF" even though it accounts for both effects. Additionally, the multiplier which transforms the Exposure Value in the final Risk Exposure corresponds to the "Risk Weight". As different assets have different probabilities of becoming an impairment, the RWs are expected to fluctuate according to the level of risk of a position and the regulatory approach followed for its reporting.

With the exception of Banco Comercial Português and Novo Banco which use the IRB approach for the treatment of 65% and 61% of their Exposure Value, the remaining Portuguese institutions rely fully on the Standardised methodology. In respect to their peers, 63% of banks from Cluster Large and 40% of those from Cluster Small resort to internal models, with 71% being the average exposure measured with this approach. Despite the RWs being on average lower, Portuguese banks fall short in terms of their usage, particularly smaller institutions. According to the paper from Sophia Döme and Stefan Kerbl, the country where a bank is headquartered also effects until some extent the RWs attained from internal models.

When it comes to the overall CCF multiplier, it ranged from 82,9% in Novo Banco to 89% in Caixa Central de Crédito Agrícola and its average of 86,2% is half a percentage point lower than the mean value of the banks from both clusters. In this sense, if RWs were also in line Portuguese Banks would be on average required to hold the same amounts of capital than

their peers for each unit of Original Exposure detained. However, that does not occur since the mean RW of 52% in Portuguese Large Banks and of 48,5% in Portuguese Small Banks is respectively 10,6 and 9,8 percentage points higher than the values from both clusters. Over the past three years the Risk Exposure decreased on average 15,7% in Portuguese Banks, with its two components having reported an average reduction of 7,8% in respect to the Exposure Value and 4,7 percentage points in terms of the RW multiplier. The only exceptions were the increase of exposures in Caixa Central de Crédito Agrícola and the RW in Banco Comercial Português.

From Annex 6 and 7 it is possible to compare each individual institution with the values from their peers across regulatory classes, categories, different types of exposures and their respective multipliers, while differentiating between both the Standardised and IRB approaches. However, in order to provide a better sense of appraisal regulatory classes of Credit Risk were aggregated in four major categories.

Table 7: Decomposition of Risk Exposure across four major categories of Credit Risk as a % of its total

	Governments + Institutions	Corporates	Retail + Secured by Mortgages on IP	Others
Caixa Geral de Depósitos	16,6%	33,4%	33,5%	16,5%
Banco Comercial Português	7,2%	39,7%	25,2%	27,9%
Novo Banco	10,3%	45,9%	11,7%	32,0%
Cluster Large	10,7%	45,0%	28,6%	15,8%
Banco Português de Investimento	5,3%	42,3%	39,1%	13,3%
Caixa Económica Montepio Geral	4,2%	21,4%	39,7%	34,8%
Caixa Central de Crédito Agrícola	1,8%	25,4%	39,5%	33,2%
Cluster Small	11,9%	38,7%	32,1%	17,3%

Governments = Central governments or central banks; Regional governments or local authorities; Public sector entities; Multilateral Development Banks; International Organisation

Others = Exposures in default; Items associated with particularly high risk; Covered bonds; Claims on institutions and corporate with a short-term credit assessment; Claims in the form of CIU; Equity Exposures; Securitisations: Other items & Other not credit obligation assets

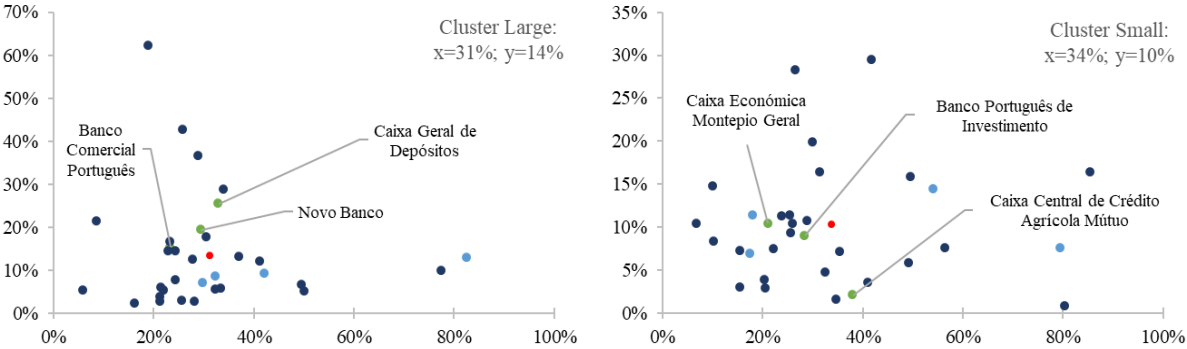
Apart from Caixa Geral de Depósitos, Portuguese banks have a relatively lower exposure to the class “Governments + Institutions” and with the exception of Novo Banco and Banco Português de Investimento they also need to allocate a lower portion of own funds to

cover their positions to “Corporates”. In general terms, the opposite occurs in the remaining categories, “Retail + Secured by Mortgages on Immovable Property” and “Others”.

Intuitively, Portuguese banks may have a relatively higher RW by overrepresentation of their Exposure Value in categories which require a higher amount of capital and/or by having an enhanced RW across their classes of risk. Thus, on the following graphs banks are organized according to their RWs and Exposure Values for each category. To differentiate between both reporting methodologies, banks whose internal models were used on more than 25% of the Exposure Value of a given category are emphasized in light blue. Due to its relevancy, expected future changes on the current regulatory paradigm were also incorporated on the analysis.

a. Class Governments + Institutions

Graphs 4: Distribution of Portuguese Banks and respective peers (x-axis = % of total Exp. Value; y-axis RW)



Having registered a low variability across Portuguese institutions, the major constituents of this category in terms of Exposure Value are the positions to central governments or central banks and to Institutions, which comprise on average 82% and 13% of its total. In relation to their peers, the mean values for these two classes are instead 61% and 26%. With an average of 99% in Portugal and 96,7% in the industry, the impact of the CCF multiplier is insignificant.

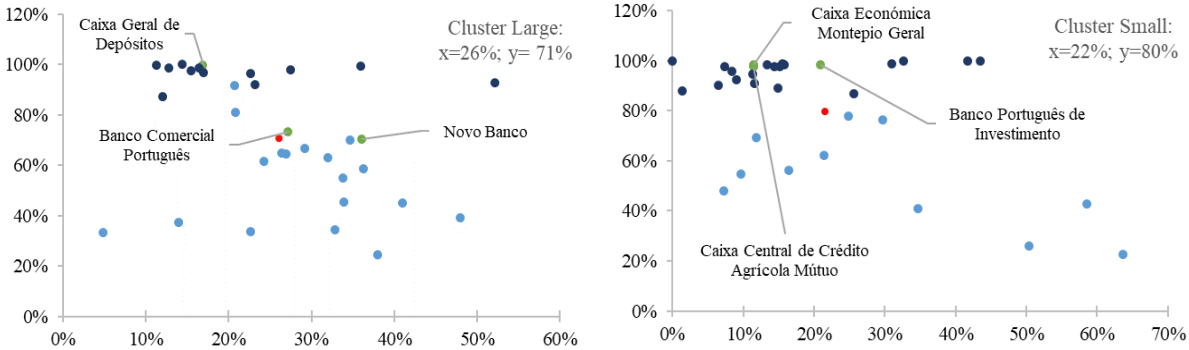
Despite being possible to resort to internal models, due to the lower incentives from doing so only 8 institutions and none from Portugal followed this approach on at least 25% of their exposures. According to the *CRR*, under the Standardised Approach the RWs may vary

between 0% and 150% depending on external credit ratings. Favourably, for exposures to a central government or central bank of a Member State a 0% RW is applicable and for unrated Institution it should be considered the rating of its nation central government instead. Not having yet been transposed to European legislation, *Basel III: finalising post-crisis reforms* introduces a different methodology for exposures to unrated banks which allocates different RWs according to banks compliance with the regulatory capital requirements.

The average RW of 13,7% for Portugal and 11,9% for its peers are significantly lower than the multipliers from the reminiscent categories. Thus, despite representing a considerably large portion of banks' Exposure Value, after considering the effect from RWs its relevance diminishes (i.e. weights decrease from 28,8% to 7,56% in Portugal and from 32,5% to 11,3% for their peers). Analysing its evolution since December 2015, even though the Exposure Value increased in 4 out of the 6 Portuguese Banks, due to improvements on the RWs for the remaining banks only Caixa Geral de Depósitos and Novo Banco registered an increase on the Risk Exposure, which decreased on average 20,5%. In line with the values from Graphs 5 and Table 7, in June 2018 these two institutions are required to hold relatively higher amounts of capital to cover their positions and the opposite occurs to Caixa Central de Crédito Agrícola.

b. Corporates

Graphs 5: Distribution of Portuguese Banks and respective peers (x-axis = % Exp. Value; y-axis RW)



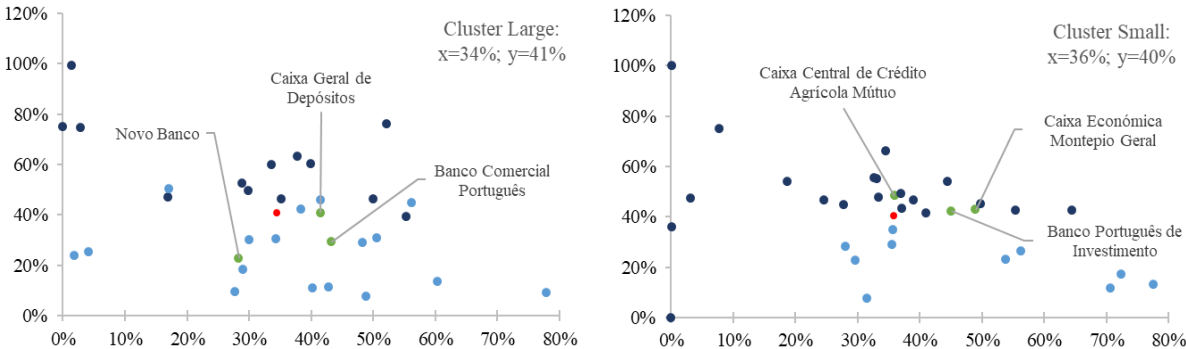
The class Corporates refers to larger companies which do not conform with the requisites to be treated as retail. Even though under the Standardised Approach the RWs are

expected to fluctuate from 20% to 150%, the RW of 100% applicable to corporates without a rating comprises the vast majority of positions in this reporting methodology. Therefore, with the possibility of attaining a lower RW through the usage of internal models, there are now 38 institutions which recur to this approach, including both Banco Comercial Português and Novo Banco. Despite being lower than the Standardised approach, their RWs' would continue to be considered high if accessed solely with banks which use the IRB methodology.

The relatively higher RW for this category requires greater levels of own funds to be held for each unit of Exposure Value, thus enhancing its relevancy in terms Risk Exposure (i.e. weights increase from 20,7% to 34,7% in Portugal and from 23,8% to 41,8% for their peers). However, opposite to the previous category the effect from the CCF is now advantageous due to a multiplier of 75% both for Portugal and their peers. Since December 2015 the Risk Exposure for this category decreased on average 18,5% across Portuguese Banks, mostly due to a decrease of the subjacent exposure value by 17,4%. Having remained considerably steady for the institutions which used the Standardised approach, the RW multiplier for Banco Comercial Português and Novo Banco decreased respectively 3,5 and 1,6 percentage points.

c. Class Retail + Secured by Mortgages on Immovable Property

Graphs 6: Distribution of Portuguese Banks and respective peers (x-axis = % Exp. Value; y-axis RW)



Note: IRB approach is only applicable for the Retail class

To be considered an exposure to Retail the position needs to be either referent to a natural person or a Small and medium-sized enterprise. Apart from not exceeding a cumulative

exposure of €1M, the enterprise must have less than 250 employees and an annual turnover inferior to €50M or an annual balance sheet inferior to €43M. Despite the RW multiplier of 75% under the Standardised Approach, a factor of 0,7619 is applicable to further incentivize financial institutional lending to SMEs. When it comes to positions secured by Mortgages on Immovable Property they can either be referent to residential or commercial property. As the loans conceived under this class have a collateral associated to them, the respective RWs of 35% and 50% result in relatively lower amounts of capital having to be held by institutions. Under the proposals for the *CRR II* the eligibility criteria for the SME factor will be extended and according to *Basel III: Finalising post-crisis reforms* a subtype of Retail will have a RW of 45% and PMEs which do not classify as Retail a lower multiplier of 85% instead. In respect to Exposures to Mortgages on Immovable Property the same Basel document introduces a new methodology which granulates the RWs according to a Loan to Value ratio approach.

In respect to the decomposition of this major category, the relevance of the class Retail is significantly higher for banks which resorted to internal models for the treatment of their positions. In this sense, whereas Retail represents in Banco Comercial Português and Novo Banco 97% and 83% of the total Exposure Value of this category, on the reminiscent Portuguese banks it only accounts on average for 28%. When it comes to the CCF its effect diverged between both classes. Whereas for Positions Secured by Immovable Property the multiplier registered low variability and was almost inexistent around the average of 96,9%, for the class Retail it attained a meaningful value of 74,6% in Portugal and 82,1% abroad. With the exception of Novo Banco, the remaining Portuguese Institutions have a higher Exposure Value to this aggregate category than their peers average of 35,1%. Since banks which rely on internal models attained lower RWs, if instead banks were compared according to the same reporting methodology, despite having register a higher RW the results would be more favourable for Portuguese Institutions under the Standardised approach.

As the average RW for this category is generally lower than the overall RWs the importance of this category decreases from the Exposure Value to the Risk Exposure (i.e. weights decrease from 40,5% to 31,4% in Portugal and from 35,1% to 30,4% for their peers). Since 2015 the RWs decreased on average 1,2 percentage points with all bank except Banco Comercial Português attaining an improvement. In terms of Exposure Value only Banco Português de Investimento and Caixa Económica Montepio Geral contradicted the negative. Despite the Risk Exposure having decreased on average 2,2% for this category, opposite to the reminiscent banks the three mentioned institutions reported an increase.

d. Others

The category Others encompasses the reminiscent classes not yet covered and compared with the formers possesses the highest RWs due to the enhanced level of risk associated with its constituents. Opposite to the RWs which are on average higher in Portugal, the CCF multiplier of 73% is 12,3 percentage points lower than the mean value from both clusters. However, with the exception of Banco Português de Investimento, Portuguese banks report a significantly higher Risk Exposure than their peers to this comprehensive category. In respect to the CCF effect from December 2015 to June 2018 the implied RW only declined in Caixa Geral de Depósitos and Caixa Económica Montepio Geral, as the Exposure Value diminished expressively across all Portuguese Institutions the average Risk Exposure declined on average by 17,6%, with the latter being the only bank contradicting the trend. (Annex 7 with the respective graphs for category Others and Annex 8 with summary of Credit Risk results)

Table 8: Risk Exposure of category Others by regulatory classes as a % of total Risk Exposure from Credit Risk

	Exposures in Default	Equity Exposures	Combined classes *	Other items & Other non credit-obligation assets	Σ
Large Banks Portugal	4,6%	4,6%	3,5%	12,8%	25,5%
Cluster Large	4,8%	4,5%	2,1%	4,3%	15,8%
Small Banks Portugal	8,8%	2,8%	2,9%	12,6%	27,1%
Cluster Small	4,2%	4,3%	3,1%	5,7%	17,3%

Combined classes: Items associated with particularly high risk; Covered bonds; Claims on institutions and corporate with a short-term credit assessment; Claims in the form of CIU

6. Conclusions and Recommendations

The foremost objective of the study conducted was to accomplish a comprehensive analysis of Portuguese Banks capital adequacy for June 2018 and their respective evolution while accessing the results attained with their peers from the industry. Even though due to its relevance on establishing institutions' own funds the approach for clustering relied exclusively on banks RWAs, further variables could have been incorporated on the procedure (e.g. Loans to Deposit ratio, Return on Assets, Returns on Equity, Net Interest Margin, Profit Margins).

The progressions of the Basel Accords represented not only an enhancement of capital requirements but also an increasingly complexity of its processes and methodologies. In this sense, it is of most importance that institutions enforce and develop proactive mechanisms to identify and measure the operational and financial costs of new regulatory initiatives prior to its implementation. Since legislators still need to transpose to European Law several of the recent reforms from Basel III, forthcoming alterations to the *CRR* and *CRD IV* are expected.

Having assumed the requisites from Pillar 2 to remain constant, in June 2018 all Portuguese Institutions were in compliance with the capital requirements for the subsequent year, being on average 1,33% above their minimum capital ratio. When compared to their peers the regulatory capital held to absorb the impact of unexpected losses and secure solvency during periods of distress is still considerably lower. With CET 1 capital ranging from 84,1% to 99,2% of institutions own funds and comprising on average 90,8% of its total, Portuguese banks but particularly smaller institutions fell behind in terms of the diversification of funding's through the usage of AT 1 and Tier 2 capital instruments. Over the past three years the enhancements to the capital ratio were in percentages points higher in Portugal than abroad and smaller institutions attained on average higher improvements. However, whereas the driver for both clusters was a preeminent increase in own funds by 8,4%, in Portugal the major catalyst was an expressive decline in RWAs by 13,2%.

Corresponding only to 3,1% and 8,0% of total RWAs, Market Risk and Operational Risk were not further incorporated on the analysis due to their diminished size and lack of contribution for the observable decrease in RWAs. In contrast, having registered low variability across the average of 86,8%, Credit Risk is the major component of banks RWAs. Over the past three years the Risk Exposure of Portuguese Banks decreased on average 15,7% due to both a reduction of the Exposure Value by 7,8% and a decline on the overall RWs by 4,7 percentage points. However, in contrast with the relatively close value for the CCF multiplier, the RW of 50,2% in Portugal is still 10,2 percentage points higher than the averages from both clusters. Breaking down the analysis it was possible to access a relatively lower Risk Exposure to Institutions and Corporates and significative higher RWAs for the category Others. With a relevance in terms of Risk Exposure in line with its peers, Retail + Secured by Mortgages on Immovable Property was the only category where Portuguese Banks attained a lower RW than their peers. Additionally, even though on average the IRB approach encompassed a lower RW, with the exception of Banco Comercial Português and Novo Banco the remaining institutions rely fully on the Standardised Approach for the treatment of their exposures.

To conclude, three Portuguese institutions were identified as more prone to face capital adequacy constraints. Novo Banco was selected due to a prevailing negative net income, Banco Comercial Português because its margin of safety from the minimal capital requirements is insufficient to meet the enhancements to the O-SII buffer and Caixa Económica Montepio Geral due to its low profitability and inexistent margin. Either through an increase in own funds or a decrease in RWAs (e.g. reduction or transference of exposures to classes with lower RWs such as Governments and Institutions, securitisation of positions, incentivize credit risk mitigations techniques, shift to internal models), as a final remark it is advised for Portuguese institutions to endure further improvements to the Capital Ratio and attain a at least a 2,5% to 5% margin of safety to further diminish regulatory constraints during unfavourable market conditions.

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8. Annexes

Annex 1: RWAs of banks from Cluster Large and Cluster Small

Large Banks	RWAs	Small Banks	RWAs
Caixa Geral de Depósitos SA	49 872	Banco Português de Investimento	16 882
Banco Comercial Português SA	41 793	Caixa Económica Montepio Geral, SA	11 259
Novo Banco, SA	32 287	Caixa Central Crédito Agrícola Mútuo	8 909
Raiffeisenbankengruppe OÖ Verbund	25 445	Arion banki hf	6 450
Abanca Holding Financiero, S.A.	26 489	Íslandsbanki hf.	6 639
OTP Bank Nyrt.	27 594	Landsbankinn	7 711
Bank Polska Kasa Opieki SA	27 816	Sydbank	7 746
Erwerbsgesellschaft S-Finanzgruppe	28 472	Sberbank Europe AG	8 304
HASPA Finanzholding AG	28 803	Investar	8 531
Kutxabank, S.A.	29 411	Nova Ljubljanska Banka D.D.	8 693
BPER Banca S.p.A.	31 130	Volksholding B.V.	9 452
RCI banque	31 571	Banca Transilvania	9 526
Bankinter, S.A.	32 474	Sparebank 1 SMN	10 213
DEXIA SA	32 749	Aareal Bank AG	10 615
National Bank of Greece, S.A.	36 054	Precision Capital S.A.	10 681
Nationwide Building Society	36 600	N.V. Bank Nederlandse Gemeenten	12 152
Eurobank Ergasias, S.A.	37 795	Deutsche Apotheker- und Ärztebank	12 492
Citibank Holdings Ireland Limited	39 678	Iccrea Banca Spa	12 674
Swedbank – group	41 565	Credito Emiliano Holding SpA	13 240
NRW.Bank	45 516	SR-bank	13 334
Bank of Ireland Group plc	45 760	Volksbanken Verbund	13 395
Norddeutsche Landesbank Girozentrale	45 773	Deutsche Pfandbriefbank AG	13 744
Nykredit Realkredit	46 658	Banca Carige SpA	14 976
PKO Bank Polski SA	47 162	Landwirtschaftliche Rentenbank	15 198
Mediobanca SpA	47 363	Banque et Caisse d'Epargne de l'Etat	16 922
Alpha Bank AE	48 079	Bank of Cyprus Holdings PLC	17 189
Piraeus Bank SA	48 808	Liberbank, S.A.	17 254
OP Financial group	51 003	Landeskreditbank Baden-Württemberg– Förderbank	19 092
Belfius Banque SA	51 218	BAWAG Group AG	20 271
Landesbank Hessen-Thüringen	51 881	Ibercaja Banco, S.A.	22 156
AIB Group plc	52 015	Banca Popolare di Sondrio	22 208
Svenska Handelsbanken – group	52 976	Banco de Crédito Social Cooperativo	23 424
Unione di Banche Italiane SpA	60 176	Unicaja Banco, S.A.	23 878
Large Banks Portugal	41 317	Small Banks Portugal	12 350
Cluster Large	40 268	Cluster Small	13 605

Annex 2: Institutions Leverage Ratio in June 2018

	Ratio		Ratio
Caixa Geral de Depósitos	7,9%	Banco Português de Investimento	6,7%
Banco Comercial Português	7,4%	Caixa Económica Montepio Geral	7,8%
Novo Banco	8,8%	Caixa Central Crédito Agrícola Mútuo	7,1%
Large Banks Portugal	8,0%	Small Banks Portugal	7,2%
Cluster Large	7,7%	Cluster Small	7,2%

Annex 3: Phased-in Capital Ratio percentage points variation per semester from 2016 to June 2018 and average total variation of its Own Funds and RWAs

Capital Ratio Variation	Capital Ratio						Own Funds	RWAs
	2016/06	2016/12	2017/06	2017/12	2018/06	Total		
Caixa Geral de Depósitos	-1,07	-3,16	6,56	0,98	0,57	3,89	8,9%	-17,3%
B. Comercial Português	-0,97	0,06	0,61	0,73	-1,41	-0,98	-10,1%	-3,5%
Novo Banco	-1,44	0,02	-0,99	1,91	1,74	1,23	-7,7%	-15,4%
Cluster Large	0,25	0,36	0,08	0,24	0,07	0,93	5,7%	0,3%
Banco P. de Investimento	0,14	0,42	1,90	1,26	-0,02	3,70	-4,5%	-28,8%
C. E. Montepio Geral	1,20	-0,09	2,09	0,37	0,32	3,88	12,8%	-19,4%
C. C. Crédito Agrícola	0,79	0,09	0,21	-0,36	1,31	2,05	22,0%	5,1%
Cluster Small	0,20	0,94	0,36	0,22	0,39	2,11	11,1%	1,8%

Annex 4: Classification of off-balance sheet exposures according to the applicable CCF

Note: For on balance sheet exposures this CCF is 100%

Source: Capital Requirements Regulation No. 575/2013

Full risk (100%)	<ul style="list-style-type: none"> (a) guarantees having the character of credit substitutes, (e.g. guarantees for the good payment of credit facilities); (b) credit derivatives; (c) acceptances; (d) endorsements on bills not bearing the name of another institution (e) transactions with recourse (e.g. factoring, invoice discount facilities); (f) irrevocable standby letters of credit having the character of credit substitutes; (g) assets purchased under outright forward purchase agreements; (h) forward deposits (i) the unpaid portion of partly-paid shares and securities; (j) asset sale and repurchase agreements as referred to in Article 12(3) and (5) of Directive 86/635/EEC; (k)) other items also carrying full risk.
Medium risk (50%)	<ul style="list-style-type: none"> (a) trade finance off-balance sheet items, namely documentary credits issued or confirmed (see also 'Medium/low risk'); (b) other off-balance sheet items: <ul style="list-style-type: none"> i) shipping guarantees, customs and tax bonds; ii) undrawn credit facilities (agreements to lend, purchase securities, provide guarantees or acceptance facilities) with an original maturity of more than one year; iii) note issuance facilities (NIFs) and revolving underwriting facilities (RUFs); iv) other items also carrying medium risk and as communicated to EBA. 3.
Medium/Low risk	<ul style="list-style-type: none"> (a) trade finance off-balance sheet items: <ul style="list-style-type: none"> i) documentary credits in which underlying shipment acts as collateral and other self-liquidating transactions;

(25%)	<ul style="list-style-type: none"> ii) warranties (including tender and performance bonds and associated advance payment and retention guarantees) and guarantees not having the character of credit substitutes; iii) irrevocable standby letters of credit not having the character of credit substitutes; <p>(b) other off-balance sheet items:</p> <ul style="list-style-type: none"> i) undrawn credit facilities which comprise agreements to lend, purchase securities, provide guarantees or acceptance facilities with an original maturity of up to and including one year which may not be cancelled unconditionally at any time without notice or that do not effectively provide for automatic cancellation due to deterioration in a borrower's creditworthiness; ii) other items also carrying medium/low risk and as communicated to EBA. 27.6.2013 Official Journal of the European Union L 176/295 EN 4.
Low risk (0%)	<p>(a) undrawn credit facilities comprising agreements to lend, purchase securities, provide guarantees or acceptance facilities which may be cancelled unconditionally at any time without notice, or that do effectively provide for automatic cancellation due to deterioration in a borrower's creditworthiness. Retail credit lines may be considered as unconditionally cancellable if the terms permit the institution to cancel them to the full extent allowable under consumer protection and related legislation;</p> <p>(b) undrawn credit facilities for tender and performance guarantees which may be cancelled unconditionally at any time without notice, or that do effectively provide for automatic cancellation due to deterioration in a borrower's creditworthiness; and</p> <p>(c) other items also carrying low risk and as communicated to EBA.</p>

Annex 5: Credit Risk distribution per class of risk in June 2018

Notes: Data was retrieved from EBA's transparency exercise and the values correspond to the averages from the banks within each set. With the purpose of not skewing the values for distribution of exposures across the four classes and for both multipliers, their computation originated from the average ratios of banks and not from the average value of their exposures. As mentioned, the CCF multiplier also accounts for the effect of mitigation.

Large Banks Portugal	Original Exposure			Exposure Value			Risk Exposure			CCF	RW
	STD	IRB	Total	STD	IRB	Total	STD	IRB	Total		
Central governments or central banks	15473	0	15473	15843	0	15843	2344	0	2344	103%	12%
Regional governments or local authorities	796	0	796	750	0	750	164	0	164	92%	21%
Public sector entities	334	0	334	207	0	207	227	0	227	60%	121%
Multilateral Development Banks	22	0	22	74	0	74	0	0	0	268%	0%
International Organisations Institutions	0	0	0	0	0	0	0	0	0		
	2348	935	3283	2011	691	2702	580	829	1409	81%	54%
Corporates	11286	11700	22986	7328	9653	16981	7232	6316	13548	74%	81%
Retail	5286	13581	18866	3183	12883	16066	2106	2830	4936	80%	37%
Secured by mortgages on immovable property	10735	0	10735	10605	0	10605	3950	0	3950	96%	49%
Exposures in default	3722	0	3722	1548	0	1548	1684	0	1684	42%	111%
Items associated with particularly high risk	279	0	279	261	0	261	392	0	392	93%	150%
Covered bonds	12	0	12	12	0	12	2	0	2	99%	18%
Claims on institutions and corporate with a short-term credit assessment	0	0	0	0	0	0	0	0	0		
Claims in the form of CIU	570	0	570	453	0	453	473	0	473	88%	137%
Equity exposures	129	668	797	121	643	764	131	1463	1594	95%	191%
Other items	782	0	782	627	0	627	391	3596	3987	80%	62%

Securitisation	5	1334	1339	5	1240	1245	3	358	361	97%	43%
TOTAL	51777	28217	79994	43028	25110	68138	19679	15392	35070	85%	52%
a. Gov + Institutions			25%			29%			11%	98%	20%
b. Corporates			31%			27%			40%	74%	81%
c. Retail + Sec Mort on IP			36%			38%			23%	90%	31%
d. Others			9%			7%			25%	68%	203%

Cluster Large	Original Exposure			Exposure Value			Risk Exposure			CCF	RW
	STD	IRB	Total	STD	IRB	Total	STD	IRB	Total		
Central governments or central banks	11300	6800	18100	12041	7247	19288	1162	550	1713	111%	11%
Regional governments or local authorities	3709	0	3709	3799	0	3799	168	0	168	92%	17%
Public sector entities	1422	0	1422	1174	0	1174	162	0	162	73%	36%
Multilateral Development Banks	259	0	259	271	0	271	1	0	1	102%	1%
International Organisations	664	0	664	663	0	663	0	0	0	96%	0%
Institutions	6560	6382	12942	4493	6205	10698	964	717	1681	77%	23%
Corporates	10413	25964	36377	7300	21034	28334	6790	9091	15881	78%	71%
Retail	6046	29747	35793	4186	28902	33088	3004	3885	6890	81%	45%
Secured by mortgages on immovable property	6516	0	6516	6345	0	6345	2888	0	2888	97%	44%
Exposures in default	3222	0	3222	1737	0	1737	1908	0	1908	54%	119%
Items associated with particularly high risk	167	0	167	133	0	133	200	0	200	86%	150%
Covered bonds	306	0	306	306	0	306	41	0	41	100%	15%
Claims on institutions and corporate with a short-term credit assessment	205	0	205	160	0	160	106	0	106	69%	70%
Claims in the form of CIU	125	0	125	124	0	124	114	0	114	99%	115%
Equity exposures	685	134	819	683	134	817	1261	345	1607	100%	177%
Other items	1861	0	1861	1804	0	1804	1222	221	1443	98%	170%
Securitisation	218	1648	1866	205	1586	1791	101	191	293	82%	111%
TOTAL	53676	70676	124352	45423	65109	110532	20092	15002	35095	87%	41%
a. Gov + Institutions			29%			31%			11%	97%	14%
b. Corporates			29%			26%			45%	78%	71%
c. Retail + Sec Mort on IP			33%			34%			29%	88%	41%
d. Others			9%			8%			16%	85%	96%

Small Banks Portugal	Original Exposure			Exposure Value			Risk Exposure			CCF	RW
	STD	IRB	Total	STD	IRB	Total	STD	IRB	Total		
Central governments or central banks	5179	0	5179	5257	0	5257	65	0	65	101%	10%
Regional governments or local authorities	523	0	523	413	0	413	83	0	83	98%	21%
Public sector entities	76	0	76	74	0	74	74	0	74	85%	100%
Multilateral Development Banks	21	0	21	53	0	53	0	0	0	98%	0%
International Organisations	0	0	0	0	0	0	0	0	0		

Institutions	691	0	691	680	0	680	229	0	229	107%	24%
Corporates	4681	0	4681	3556	0	3556	3487	0	3487	78%	98%
Retail	3729	0	3729	2694	0	2694	1692	0	1692	69%	63%
Secured by mortgages on immovable property	7311	0	7311	7128	0	7128	2601	0	2601	98%	36%
Exposures in default	1415	0	1415	806	0	806	886	0	886	48%	111%
Items associated with particularly high risk	80	0	80	80	0	80	120	0	120	97%	150%
Covered bonds	1	0	1	1	0	1	0	0	0	100%	20%
Claims on institutions and corporate with a short-term credit assessment	0	0	0	0	0	0	0	0	0		
Claims in the form of CIU	172	0	172	172	0	172	172	0	172	92%	100%
Equity exposures	173	0	173	173	0	173	316	0	316	98%	141%
Other items	1654	0	1654	1348	0	1348	1181	0	1181	79%	78%
Securitisation*	1	0	1	1	0	1	1	0	1	100%	59%
TOTAL	25709	0	25709	22436	0	22436	10906	0	10906	87%	48%
a. Gov + Institutions			26%			29%			4%	100%	7%
b. Corporates			17%			15%			30%	79%	98%
c. Retail + Sec Mort on IP			42%			43%			39%	89%	44%
d. Others			16%			13%			27%	78%	106%

Cluster Small	Original Exposure			Exposure Value			Risk Exposure			CCF	RW
	STD	IRB	Total	STD	IRB	Total	STD	IRB	Total		
Central governments or central banks	5211	1224	6435	7064	1318	8383	184	111	294	116%	5%
Regional governments or local authorities	2566	0	2566	2827	0	2827	30	0	30	127%	12%
Public sector entities	1309	0	1309	1110	0	1110	57	0	57	76%	39%
Multilateral Development Banks	235	0	235	242	0	242	0	0	0	130%	1%
International Organisations	62	0	62	62	0	62	0	0	0	100%	0%
Institutions	4923	1161	6084	3178	1101	4279	835	249	1085	79%	27%
Corporates	6374	4393	10767	2986	3762	6748	2807	1471	4278	73%	80%
Retail	2926	6531	9457	1991	6436	8427	1353	1047	2400	83%	52%
Secured by mortgages on immovable property	3949	0	3949	3869	0	3869	1434	0	1434	91%	46%
Exposures in default	1194	0	1194	565	0	565	622	0	622	57%	115%
Items associated with particularly high risk	232	0	232	123	0	123	185	0	185	81%	150%
Covered bonds	675	0	675	675	0	675	74	0	74	100%	11%
Claims on institutions and corporate with a short-term credit assessment	17	0	17	17	0	17	6	0	6	76%	27%
Claims in the form of CIU	89	0	89	82	0	82	67	0	67	92%	81%
Equity exposures	229	61	290	226	61	287	333	215	548	99%	183%
Other items	1584	0	1584	1462	0	1462	781	51	832	100%	70%
Securitisation	216	62	279	192	62	255	60	7	67	88%	42%
TOTAL	31793	13432	45225	26670	12741	39411	8827	3152	11978	87%	39%

a. Gov + Institutions	30%	34%	12%	97%	10%
b. Corporates	26%	22%	39%	73%	80%
c. Retail + Sec Mort on IP	34%	36%	32%	86%	40%
d. Others	10%	9%	17%	85%	114%

Annex 6: Credit Risk distribution per class of risk for Portuguese Banks in June 2018

Caixa Geral de Depósitos	Original Exposure			Exposure Value			Risk Exposure			CCF	RW
	STD	IRB	Total	STD	IRB	Total	STD	IRB	Total		
Central governments or central banks	22517	0	22517	22600	0	22600	5290	0	5290	100%	23%
Regional governments or local authorities	1435	0	1435	1484	0	1484	340	0	340	103%	23%
Public sector entities	788	0	788	500	0	500	510	0	510	63%	102%
Multilateral Development Banks	0	0	0	0	0	0	0	0	0		
International Organisations	0	0	0	0	0	0	0	0	0		
Institutions	3750	0	3750	3651	0	3651	1053	0	1053	97%	29%
Corporates	20973	0	20973	14510	0	14510	14476	0	14476	69%	100%
Retail	11496	0	11496	6595	0	6595	4247	0	4247	57%	64%
Secured by mortgages on immovable property	29229	0	29229	29002	0	29002	10289	0	10289	99%	35%
Exposures in default	7378	0	7378	3225	0	3225	3454	0	3454	44%	107%
Items associated with particularly high risk	643	0	643	604	0	604	907	0	907	94%	150%
Covered bonds	35	0	35	35	0	35	6	0	6	99%	18%
Claims on institutions and corporate with a short-term credit assessment	0	0	0	0	0	0	0	0	0		
Claims in the form of CIU	1592	0	1592	1256	0	1256	1256	0	1256	79%	100%
Equity exposures	365	0	365	340	0	340	340	0	340	93%	100%
Other items	2346	0	2346	1881	0	1881	1174	0	1174	80%	62%
Securitisation	15	0	15	15	0	15	9	0	9	100%	57%
TOTAL	102563	0	102563	85698	0	85698	43349	0	43349	84%	51%
a. Gov + Institutions			28%			33%			17%	99%	25%
b. Corporates			20%			17%			33%	69%	100%
c. Retail + Sec Mort on IP			40%			42%			34%	87%	41%
d. Others			12%			9%			16%	59%	97%

Banco Comercial Português	Original Exposure			Exposure Value			Risk Exposure			CCF	RW
	STD	IRB	Total	STD	IRB	Total	STD	IRB	Total		
Central governments or central banks	13586	0	13586	14103	0	14103	1732	0	1732	104%	12%
Regional governments or local authorities	833	0	833	654	0	654	131	0	131	78%	20%
Public sector entities	213	0	213	121	0	121	171	0	171	57%	141%

Multilateral Development Banks	18	0	18	18	0	18	0	0	0	100%	0%
International Organisations Institutions	0	0	0	0	0	0	0	0	0		
	2686	0	2686	1939	0	1939	560	0	560	72%	29%
Corporates	8029	17328	25357	4654	14998	19652	4483	9902	14385	77%	73%
Retail	2750	29629	32380	2371	27949	30320	1675	6913	8589	94%	28%
Secured by mortgages on immovable property	966	0	966	902	0	902	536	0	536	93%	59%
Exposures in default	807	0	807	387	0	387	438	0	438	48%	113%
Items associated with particularly high risk	0	0	0	0	0	0	0	0	0		
Covered bonds	0	0	0	0	0	0	0	0	0		
Claims on institutions and corporate with a short-term credit assessment	0	0	0	0	0	0	0	0	0		
Claims in the form of CIU	23	0	23	23	0	23	34	0	34	100%	150%
Equity exposures	22	1702	1724	22	1643	1665	53	3680	3733	97%	224%
Other items	0	0	0	0	0	0	0	5593	5593		
Securitisation	0	2726	2726	0	2446	2446	0	314	314	90%	13%
TOTAL	29934	51385	81320	25194	47036	72230	9813	26402	36214	89%	50%
a. Gov + Institutions			21%			23%			7%	97%	15%
b. Corporates			31%			27%			40%	77%	73%
c. Retail + Sec Mort on IP			41%			43%			25%	94%	29%
d. Others			6%			6%			28%	86%	224%

Novo Banco	Original Exposure			Exposure Value			Risk Exposure			CCF	RW
	STD	IRB	Total	STD	IRB	Total	STD	IRB	Total		
Central governments or central banks	10317	0	10317	10825	0	10825	12	0	12	105%	0%
Regional governments or local authorities	119	0	119	111	0	111	22	0	22	94%	20%
Public sector entities	0	0	0	0	0	0	0	0	0		
Multilateral Development Banks	47	0	47	203	0	203	0	0	0	436%	0%
International Organisations Institutions	0	0	0	0	0	0	0	0	0		
	609	2804	3413	443	2072	2516	126	2487	2613	74%	104%
Corporates	4854	17772	22626	2821	13961	16782	2736	9046	11783	74%	70%
Retail	1610	11113	12723	583	10701	11284	396	1577	1973	89%	17%
Secured by mortgages on immovable property	2009	0	2009	1913	0	1913	1024	0	1024	95%	54%
Exposures in default	2981	0	2981	1033	0	1033	1158	0	1158	35%	112%
Items associated with particularly high risk	195	0	195	179	0	179	269	0	269	92%	150%
Covered bonds	0	0	0	0	0	0	0	0	0		
Claims on institutions and corporate with a short-term credit assessment	0	0	0	0	0	0	0	0	0		
Claims in the form of CIU	95	0	95	82	0	82	130	0	130	86%	160%
Equity exposures	0	303	303	0	286	286	0	708	708	94%	248%
Other items	0	0	0	0	0	0	0	5194	5194		

Securitisation	0	1274	1274	0	1274	1274	0	760	760	100%	60%
TOTAL	22835	33266	56101	18192	28294	46487	5875	19773	25648	83%	55%
a. Gov + Institutions			25%			29%			10%	98%	19%
b. Corporates			40%			36%			46%	74%	70%
c. Retail + Sec Mort on IP			26%			28%			12%	90%	23%
d. Others			9%			6%			32%	59%	288%

Banco Português de Investimento	Original Exposure			Exposure Value			Risk Exposure			CCF	RW
	STD	IRB	Total	STD	IRB	Total	STD	IRB	Total		
Central governments or central banks	6245	0	6245	6459	0	6459	9	0	9	101%	24%
Regional governments or local authorities	1085	0	1085	775	0	775	155	0	155	103%	23%
Public sector entities	121	0	121	119	0	119	118	0	118	63%	102%
Multilateral Development Banks	63	0	63	157	0	157	1	0	1		
International Organisations	0	0	0	0	0	0	0	0	0		
Institutions	1345	0	1345	1310	0	1310	516	0	516	98%	28%
Corporates	8944	0	8944	6502	0	6502	6387	0	6387	69%	100%
Retail	4688	0	4688	3102	0	3102	2010	0	2010	57%	64%
Secured by mortgages on immovable property	11092	0	11092	10896	0	10896	3897	0	3897	99%	35%
Exposures in default	728	0	728	648	0	648	668	0	668	44%	107%
Items associated with particularly high risk	59	0	59	59	0	59	88	0	88	93%	150%
Covered bonds	0	0	0	0	0	0	0	0	0	99%	19%
Claims on institutions and corporate with a short-term credit assessment	0	0	0	0	0	0	0	0	0		
Claims in the form of CIU	88	0	88	88	0	88	88	0	88	78%	100%
Equity exposures	244	0	244	244	0	244	525	0	525	93%	100%
Other items	671	0	671	671	0	671	647	0	647	80%	62%
Securitisation*	0	0	0	0	0	0	0	0	0	100%	57%
TOTAL	35373	0	35373	31029	0,00	31029	15108	0	15108	88%	49%
a. Gov + Institutions			25%			28%			5%	100%	9%
b. Corporates			25%			21%			42%	73%	98%
c. Retail + Sec Mort on IP			45%			45%			39%	89%	42%
d. Others			5%			6%			13%	95%	118%

* Data from Securitisation positions in Banco Português de Investimento was not possible to be retrieved from the Market Discipline Report of June 2018. Therefore, it was assumed to be 0.

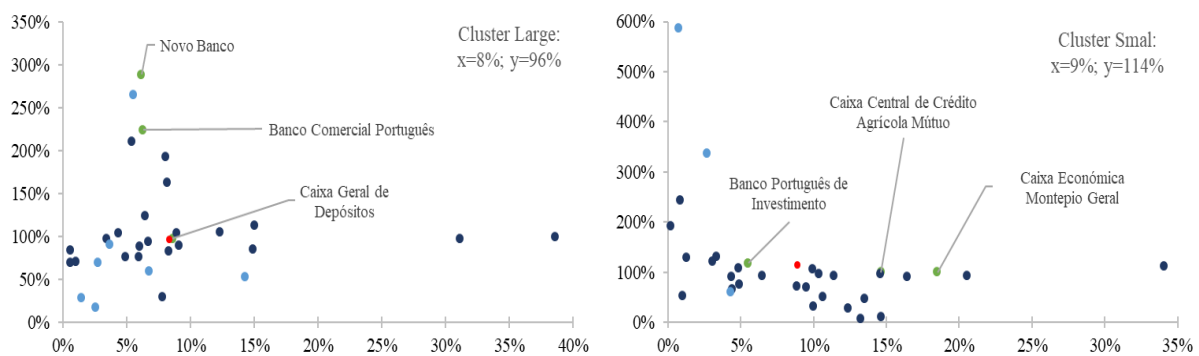
Caixa Económica Montepio Geral	Original Exposure			Exposure Value			Risk Exposure			CCF	RW
	STD	IRB	Total	STD	IRB	Total	STD	IRB	Total		
Central governments or central banks	3159	0	3159	3185	0	3185	180	0	180	101%	6%
Regional governments or local authorities	38	0	38	36	0	36	7	0	7	95%	20%

Public sector entities	71	0	71	71	0	71	71	0	71	100%	100%
Multilateral Development Banks	0	0	0	0	0	0	0	0	0		
International Organisations	0	0	0	0	0	0	0	0	0		
Institutions	660	0	660	645	0	645	154	0	154	98%	24%
Corporates	2794	0	2794	2149	0	2149	2111	0	2111	77%	98%
Retail	2635	0	2635	1796	0	1796	1122	0	1122	68%	62%
Secured by mortgages on immovable property	7666	0	7666	7353	0	7353	2799	0	2799	96%	38%
Exposures in default	2290	0	2290	1161	0	1161	1291	0	1291	51%	111%
Items associated with particularly high risk	162	0	162	162	0	162	243	0	243	100%	150%
Covered bonds	2	0	2	2	0	2	0	0	0	100%	20%
Claims on institutions and corporate with a short-term credit assessment	0	0	0	0	0	0	0	0	0		
Claims in the form of CIU	305	0	305	305	0	305	305	0	305	100%	100%
Equity exposures	158	0	158	158	0	158	158	0	158	100%	100%
Other items	2046	0	2046	1668	0	1668	1441	0	1441	82%	86%
Securitisation	4	0	4	4	0	4	2	0	2	100%	60%
TOTAL	21990	0	21990	18695	0	18695	9883	0	9883	85%	53%
a. Gov + Institutions			18%			21%			4%	100%	10%
b. Corporates			13%			11%			21%	77%	98%
c. Retail + Sec Mort on IP			47%			49%			40%	89%	43%
d. Others			23%			19%			35%	70%	99%

Caixa Central de Crédito Agrícola	Original Exposure			Exposure Value			Risk Exposure			CCF	RW
	STD	IRB	Total	STD	IRB	Total	STD	IRB	Total		
Central governments or central banks	6132	0	6132	6128	0	6128	6	0	6	100%	0%
Regional governments or local authorities	446	0	446	430	0	430	86	0	86	96%	20%
Public sector entities	37	0	37	34	0	34	33	0	33	91%	99%
Multilateral Development Banks	1	0	1	1	0	1	0	0	0	98%	0%
International Organisations	0	0	0	0	0	0	0	0	0		
Institutions	68	0	68	84	0	84	17	0	17	124%	21%
Corporates	2306	0	2306	2016	0	2016	1962	0	1962	87%	97%
Retail	3865	0	3865	3185	0	3185	1946	0	1946	82%	61%
Secured by mortgages on immovable property	3176	0	3176	3135	0	3135	1107	0	1107	99%	35%
Exposures in default	1227	0	1227	610	0	610	700	0	700	50%	115%
Items associated with particularly high risk	19	0	19	19	0	19	28	0	28	99%	150%
Covered bonds	0	0	0	0	0	0	0	0	0		
Claims on institutions and corporate with a short-term credit assessment	0	0	0	0	0	0	0	0	0		
Claims in the form of CIU	125	0	125	123	0	123	123	0	123	98%	100%
Equity exposures	117	0	117	117	0	117	264	0	264	100%	224%

Other items	2247	0	2247	1703	0	1703	1454	0	1454	76%	85%
Securitisation	0	0	0	0	0	0	0	0	0		
TOTAL	19765	0	19765	17585	0	17585	7727	0	7727	89%	44%
a. Gov + Institutions			34%			38%			2%	100%	2%
b. Corporates			12%			11%			25%	87%	97%
c. Retail + Sec Mort on IP			36%			36%			40%	90%	48%
d. Others			19%			15%			33%	69%	100%

Annex 7: Distribution of Portuguese Banks and respective peers for the category Others (x-axis = % Exp. Value; y-axis RW)



Annex 8: Decomposition of exposures and the respective multipliers for Credit Risk

		Governments + Institutions	Corporates	Retail + Secured by Mortgages on IP	Others	Overall
Portugal	Original Exposure	25,1%	23,6%	39,0%	12,3%	
	CCF multiplier	99,0%	76,3%	89,7%	73,0%	86,2%
	Exposure Value	28,8%	20,7%	40,5%	9,9%	
	RW multiplier	13,7%	89,5%	37,7%	154,3%	50,2%
	Risk Exposure	7,6%	34,7%	31,4%	26,3%	
Clusters	Original Exposure	29,5%	27,4%	33,8%	9,3%	
	CCF multiplier	96,7%	75,2%	86,6%	85,2%	86,6%
	Exposure Value	32,5%	23,8%	35,1%	8,6%	
	RW multiplier	11,9%	75,3%	40,6%	105,0%	40,1%
	Risk Exposure	11,3%	41,8%	30,4%	16,5%	