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“EU Banks’ Loan Loss Provisioning Standards under IFRS 9 in  
practice: A Case Study for Greek Banks”

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Patras, Greece, July 2021

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# “EU Banks’ Loan Loss Provisioning Standards under IFRS 9 in practice: A Case Study for Greek Banks”

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*To my family*

## **Abstract**

With the recent entry into force of IFRS 9 standards, the Loan Loss Provisioning mechanism for EU Banks has changed. This new forward-looking approach forces banks to recognise credit losses not when they have already been incurred, as was the case in the past, but to start provisioning for future losses even in good times. However, the calculation of expected losses is very sensitive to borrower solvency and macroeconomic conditions. The procyclicality of this calculation becomes extremely evident in periods of abrupt recession such as the Covid-19 era we are currently enduring. The effect of this paradigm change will be examined for the case of the Greek Banks in particular.

## **Keywords**

**Corporate Finance**

**Financial Services**

**Comparative Analysis**

**Business Data Analysis**

**Case/Comparative**

## “Προβλέψεις ζημιών δανείων υπό το λογιστικό υπόδειγμα IFRS 9 για τις ευρωπαϊκές τράπεζες στη πράξη: Η περίπτωση των ελληνικών τραπεζών”

Άννα Σμαραγδή

### Περίληψη

Με τη πρόσφατη υιοθέτηση του προτύπου IFRS 9, ο μηχανισμός υπολογισμού προβλέψεων πιστωτικών ζημιών για τις ευρωπαϊκές τράπεζες έχει αλλάξει. Η νέα αυτή μελλοντοστραφής μέθοδος αναγκάζει τις τράπεζες να αναγνωρίζουν πιστωτικές ζημιές όχι μόνο όταν έχουν ήδη συμβεί, όπως παλιά, αλλά να αρχίσουν να προβλέπουν ζημιές και στις καλές περιόδους. Ωστόσο, ο υπολογισμός αυτός επηρεάζεται από τη φερεγγυότητα του δανειζόμενου και από τις μακροοικονομικές συνθήκες. Το γεγονός ότι ο υπολογισμός αυτός συγχρονίζεται με τον οικονομικό κύκλο εμφανίζεται πολύ έντονα σε περιόδους απότομης ύφεσης όπως η περίοδος της πανδημίας τώρα. Η υιοθέτηση του λογιστικού προτύπου IFRS 9 και το πώς επηρεάζει εποπτικούς δείκτες θα είναι το αντικείμενο της εργασίας.

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## 1 Introduction

In the aftermath of the Great Financial Crisis (GFC) in the end of the first decade of this century, there was a need to understand the causes of the crisis, excessive risk-taking by the banks and the mechanisms that exacerbated the effects of the GFC. With regards to the latter, the Financial Stability Board (FSB) published in April 2009 a seminal report "Recommendations for Addressing Procyclicality in the Financial System" (Financial Stability Board, 2009). There procyclicality is defined as "the reinforcing interactions between the financial and real sectors of the economy that tend to amplify business cycle fluctuations and cause or exacerbate financial instability." The report identified controlling procyclicality as a major component of regulatory and supervisory frameworks and recommended mitigations in loan loss provision, the Basel II accord and valuation and leverage.

As a result, a number of changes were introduced to the supervisory framework through revisions in the Basel accord, commonly referred to as Basel III and then transposed into EU law with CRDIV and CRR. Moreover, the accounting framework was revisited, most notably with the publication of the IFRS 9 standards in 2014. The requirement for IFRS reporting credit institutions in the EU to report using the IFRS 9 standards came into force as of January 2018.

The purpose of this dissertation is to analyse the recent changes to the financial reporting of credit losses on loans and other financial instruments held by banks and how these changes limit procyclicality, improving financial stability. Next the figures reported by Greek Significant Institutions in the transition era are examined, focusing on the changes brought by the adoption of the IFRS 9 standards to the prudential capital ratios, the main indicator used under the Basel framework to determine a credit institution's solvency.

The aim of this dissertation is to provide a retrospective ex-post empirical study analysing the actual impact of the IFRS 9 adoption by Greek institutions versus the ex-ante theoretical potential impact for IFRS 9 that has been covered in the literature (Ntaikou, Vousinas, & Kenourgios, 2018). The focus will be on the actual impact in bank's capital structures, the strategy employed by the institutions to replenish that capital and how costly it was. Moreover from a regulatory perspective, the introduction of the transitional



period will be examined and deduce whether it was actually strictly needed or the benefits its introduction had for financial stability.

## 2 Foreground: Accounting Standards

### 2.1 IFRS vs IAS39

The IFRS 9 standard was published in 2014 by the International Accounting Standards Board (IASB, 2014) largely replacing IAS 39 Financial Instruments: Recognition and Measurement. (IASB, 2003). It is particularly important for the banking sector as it prescribes the accounting treatment of financial instruments, which is the bulk of the balance sheet of most financial institutions. Credit institutions and investment firms in the EU that use IFRS to prepare their financial statements are required to apply IFRS9 when accounting for financial instruments from January 2018 onwards. (Council Regulation (EU) 2016/2067, 2016)

IFRS9 brings a number of changes compared to the IAS39 standard it is replacing, mainly in the areas of:

- Scope:
- Classification: In IFRS9, there are 2 main criteria for classifying financial assets (IFRS 9.4.1.1):

- The business model of the reporting entity;
- The nature of cash flows of the financial asset;

Whereas in IAS39 there were specific definitions for each category, causing complexity and ambiguity on the appropriate category, which should be eradicated by the definition of the 2 aforementioned common criteria across all categories in IFRS9. The principle based approach of IFRS9 should be easier to apply in practice rather than the rule based approach of IAS39 As reclassification can occur only due to changes in the business model of the entity, they should be rare.

- Measurement: IFRS9 classifies financial assets in a number of measurement categories in which different methodologies are used

to determine their carrying amounts (mainly fair value and amortised cost) similarly to IAS39. The difference is in the reduction of the categories and reduction of exceptions to the measurement practices leading to a more streamlined process.

- Impairment requirements: The differences in the impairment modelling between IFRS9 and IAS39 will be thoroughly analysed in this chapter.

## **2.2 IAS 39 Classification and Measurement**

<b>Classification</b>	<b>Measurement</b>	<b>Gains and Losses</b>
FVTPL	Fair Value	Profit and Loss
AFS	Fair Value	Fair value gains and losses in Other Comprehensive Income (Equity)
	* Investments in equity instruments with no reliable fair value measurement and derivatives linked to them measured at cost	Interest Revenue, impairment Costs and FX gains or losses in Profit and Loss
Held to Maturity	Amortised Cost using the effective interest method	Interest and Impairment costs being recognised in profit or loss
Loans And Receivables	Amortised Cost using the effective interest method	Interest and Impairment costs being recognised in profit or loss

## **2.3 IFRS9 Classification and Measurement**

<b>Classification</b>	<b>Measurement</b>	<b>Gains and Losses</b>
Fair Value through profit or loss	Fair Value	Profit and Loss

Amortised Cost	Amortised Cost	Interest Revenue, Expected Credit Losses and FX gains or losses in Profit and Loss using the effective interest method.
Fair Value through other comprehensive income (FVOCI)	Fair Value on Balance Sheet  Amortised Cost in P&L	Fair value gains and losses in Other Comprehensive Income (Equity)  Interest Revenue, Expected Credit Losses and FX gains or losses in Profit and Loss

## 2.4 Comparison

Classification under IAS39 was done on specific definitions for each category, causing complexity and ambiguity on the appropriate category and having Available For Sale (AFS) as the residual category. Under IFRS9 classification is done by 2 tests:

- The business model of the reporting entity;
- The nature of cash flows of the financial asset;

<b>Test 1: The business model of the reporting entity</b>	<b>Test 2: Nature of Cashflows</b>	<b>Classification</b>
To collect contractual cash flows over the life of the instrument	Cash flows are <b>solely payments of principal and interest</b>	Amortised Cost
Both to collect and sell contractual cash flows	Cash flows are <b>solely payments of principal and interest</b>	Fair Value through other comprehensive income (FVOCI)

Financial assets not in the above table will be categorised to FVTPL (residual category)

From the above, IFRS9 adoption should reclassifications as a rare event as they can only occur only due to changes in the business model of the entity. Moreover, the principle based approach of IFRS9 should be easier to apply in practice rather than the rule based approach of IAS39.

## **2.5 Impairment modelling under IAS39**

Financial assets subject to impairment, are only the ones carried at:

- Amortised Cost
- Cost
- In the Available for Sale Portfolio

From the above, financial assets measured at fair value through profit or loss (FVPL) are excluded.

Financial assets are assessed for impairment at each reporting period ("impairment testing") (IAS 39.58)

Recognition of credit loss happens only when there is objective evidence of it, i.e. requires the occurrence of a loss event with impact on estimated future cashflows of the financial asset. This is usually referred in the literature as the "incurred loss model".

Any impairment loss is charged to net profit or loss for the period.

According to the classification of the financial asset, for which the loss event has occurred, impairment modelling takes different forms:

- Financial Assets classified as Held To Maturity (HTM) and Loans and Receivables (L&R):

- Impairment loss is the difference between the 'carrying amount and the present value of estimated future cash flows discounted at the financial asset's original effective interest rate (IAS 39.63)
- Impairment loss either reduces directly the carrying amount of the asset or through the use of an allowance account.
- Individual or collective assessment (IAS39.64)
- Impairment losses can be reversed in the future.
- Financial Assets classified as Available For Sale (AFS):
  - Impairment loss is the difference between the acquisition cost (net of any principal repayment and amortisation) and current fair value' (IAS 39.68).
  - The cumulative loss that had been recognised directly in other comprehensive income is reclassified from equity to profit or loss as a reclassification adjustment. Consequently, fair value changes of such financial assets are 'recycled' from other comprehensive income to net income when impairment occurs.
  - For Debt instruments impairment losses can be reversed in the future through Profit and Loss. No such reversal is possible for Equity Instruments (IAS39.65)
- Equity Instruments measured at cost:
  - Impairment loss is the difference between the carrying amount of the financial asset and the present value of estimated future cash flows discounted at the current market rate of return for a similar financial asset
  - Impairment losses cannot be reversed in the future.

## **2.6 Impairment modelling under IFRS9**

IFRS9 has a single impairment model for all debt instruments and loans. Its scope includes:

- Debt instruments measured at amortised cost or Fair Value through other comprehensive income (FVOCI)
- Loan commitments and Financial Guarantees if not measured at fair value through Profit & Loss (FVPL)
- Lease receivables ( IFRS 16)

It aims at the timely recognition of expected credit losses by introducing a forward-looking model which identifies exposures with significant deterioration of credit risk but not yet impaired.

The main pillars of the IFRS 9 approach are:

- **Expected loss:** An estimate of the present value of all cash shortfalls of an exposure for a given time period. As evident from the definition above, the time value of money is taken into account and expected loss is a probability weighted outcome; the possibility that default will occur or will not occur is embedded in the estimate.
- **Staging:** Exposures are classified into different stages according to the increase in credit risk since initial recognition. This 3 stages classification is considered to capture more effectively the worsening in credit quality (broadly Stage 1 refers to performing, Stage 2 refers to underperforming and stage 3 refers to non-performing exposures)

	<b>Stage 1</b>	<b>Stage 2</b>	<b>Stage 3</b>
Contains:	Exposures at initial recognition Exposures with low credit risk	Exposures with Significant increase in credit risk (SICR)	Credit impaired
Time horizon of Expected Credit losses	1-year	Lifetime	Lifetime
Effective Interest Rate applied to:	Gross carrying Amount	Gross carrying Amount	Net carrying amount

An exposure is initially classified in Stage 1 (unless it is an exposure originated/purchased as credit impaired). Pricing is considered to already reflect the credit worthiness of the counterpart at origination. At this stage, taking into account 1-year expected credit loss is considered appropriate.

At each reporting date the classification is updated based on new information and changes in expectations. Post-origination increase in credit risk may not be fully compensated by the interest rate charged. If credit risk has

increased significantly since initial recognition the exposure is classified as stage 2 and if credit-impaired the exposure is classified as Stage 3.

Summarizing what is central to impairment modelling under IFRS is a single forward-looking impairment model with no single trigger event for the recognition of expected credit losses, resulting in a more timely recognition of expected credit losses. The measurement of expected credit losses is based on a wide range of information and warrants more use of judgement.

As obvious from above there are two key factors that affect IFRS 9 impairment modelling implementations in banks:

- The factors that the bank takes into account when making the assessment of Significant Increase in Credit Risk (SICR) which are usually a combination of borrower specific factors (e.g. operating results, collateral), factors related with a specific geographical region/economic sector and macroeconomic factors (e.g. GDP, unemployment rate).
- The Expected Credit Loss (ECL) measurement. While IFRS 9 does not prescribe a specific model for measuring ECL, most banks utilise a Probability of Default (PD) x Loss Given Default (LGD) x Exposure At Default (EAD) approach consistently with the prudential regulation. However, alternative approaches (e.g. loss rate) can also be utilised.



## **2.7 Cyclical effects of IFRS 9 Loan Loss Provisioning Standards**

A key issue for regulators and supervisors is the design of macroprudential policies that ensure financial stability. A key aspect of this is the mitigation of the procyclicality of the financial system, as (Agénor, 2015) put it “credit booms and busts that exacerbate the inherent cyclicity of lending—and consequently distort investment decisions, either by fueling excessive growth in credit or restricting access to bank finance”. Focusing specifically on loan loss provisioning the contrast of incurred losses vs forward looking provisioning is described in (Laeven, 2019). Loans are more likely to become impaired during economic downturns, and hence the application of IAS 39 implied that loan loss provisions were concentrated during economic downturns. Therefore, the incurred loss model of IAS 39 caused banks’ capitalization rates to decline especially during economic downturns. In other words, accounting standards rendered loan loss provisioning procyclical. This can pose a threat to financial stability, as banks find it difficult to raise additional capital at times of negative economic growth and low profitability. The new accounting rules under IFRS 9 require banks to take material provisions also during economic expansions, in the absence of significant credit impairment, to reflect the probability of a business cycle turn, which could induce greater credit losses later. More provisioning in anticipation of the next economic downturn implies that banks have higher loan loss reserves once a downturn occurs, and that they need to take fewer provisions during economic declines. This is the view supported by the (European Systemic Risk Board, 2017). “The introduction of IFRS 9 thus could mitigate the negative relationship between provisioning and economic growth, with a potentially positive effect on financial stability”

The cyclical effects of bank capital regulation have been thoroughly analyzed by a wide theoretical and empirical literature, (Laeven L., 2003) offer a historical review starting after the 1st Basel Accord whereas (Athanasoglou, 2014) focus on the policy aspects of this procyclicality.

Focusing specifically on the loan loss provisioning mechanisms, (Abad, 2018) conclude upon the arrival of a recession that the loan loss provisions under IFRS 9 and ECL will be higher upfront compared to earlier provisioning schemes (IAS 39). It seems that the

adoption of IFRS 9 and ECL addresses the Basel Committee criticism of “too little too late” loan loss provisions. The late provisioning of incurred losses provisioning models like IAS 39 is also supported by empirical work of (Wang, 2018) where impairment charges remained at low levels until the realization of sharp discontinuous growth in loan delinquencies during the latest part of the Great Financial Crisis.

However, (Abad, 2018) claim that this conclusion is valid when banks are able to predict the timing and magnitude of a recession. When the economic contraction is longer than average or more severe than economic cycle theory would warrant (also linked to the scenarios and the probability weights of them under the bank's IFRS 9 modelling) the more forward-looking provisioning methods might reduce regulatory capital severely at the start of the recession. (Abad, 2018) continue by arguing that banks tend to respond to this decrease in regulatory capital by reducing Risk Weight Assets ( either by asset selling, rebalancing its asset portfolio to safer assets, or reducing the origination of new loans) rather than by cutting dividends, issuing new equity or by consuming capital buffers accumulated during good times, as the supervisors, regulators would have liked. This reluctance of credit institutions to cut dividends became evident during the COVID-19 crisis, as evident in a speech by the Chair of the Supervisory Board of the ECB in June 2020 (Andrea Enria, 2020).

This view is also supported by (Huber, 2018) suggests that banks tend to accommodate sudden increases in required capital (caused by the higher provisioning needs) by reducing bank lending, especially in times of recession, thus enhancing the effect of the recession.

### 3 Methodology: Regulatory Treatment

#### 3.1 The regulatory transition to full IFRS 9 adoption

In order to facilitate the transition to IFRS 9, EU policymakers have legislated voluntary transitional arrangements that would assist banks to absorb the additional capital requirements stemming from the application of IFRS 9 over a longer timeframe thus protecting them from sudden decrease’s in CET1 capital and potential capital increases that might be required. Provisions are meant to cover expected credit loss whereas capital is meant to cover unexpected losses. Under the expectation that loss provisions will be bigger with IFRS 9, policymakers were concerned that this would reduce equity and retained earnings that are part of Tier 1 capital, thus damage the capital ratios of the credit institutions.

By virtue of article 473a of the CRR Regulation (EU) banks are allowed to include pre-defined percentages of IFRS9-induced provisions in their CET1 capital following a calendar of the increase in provisions due to the introduction of IFRS 9 and particularly its expected loss accounting that was covered in an earlier chapter.

The following calendar applies in article 473a:

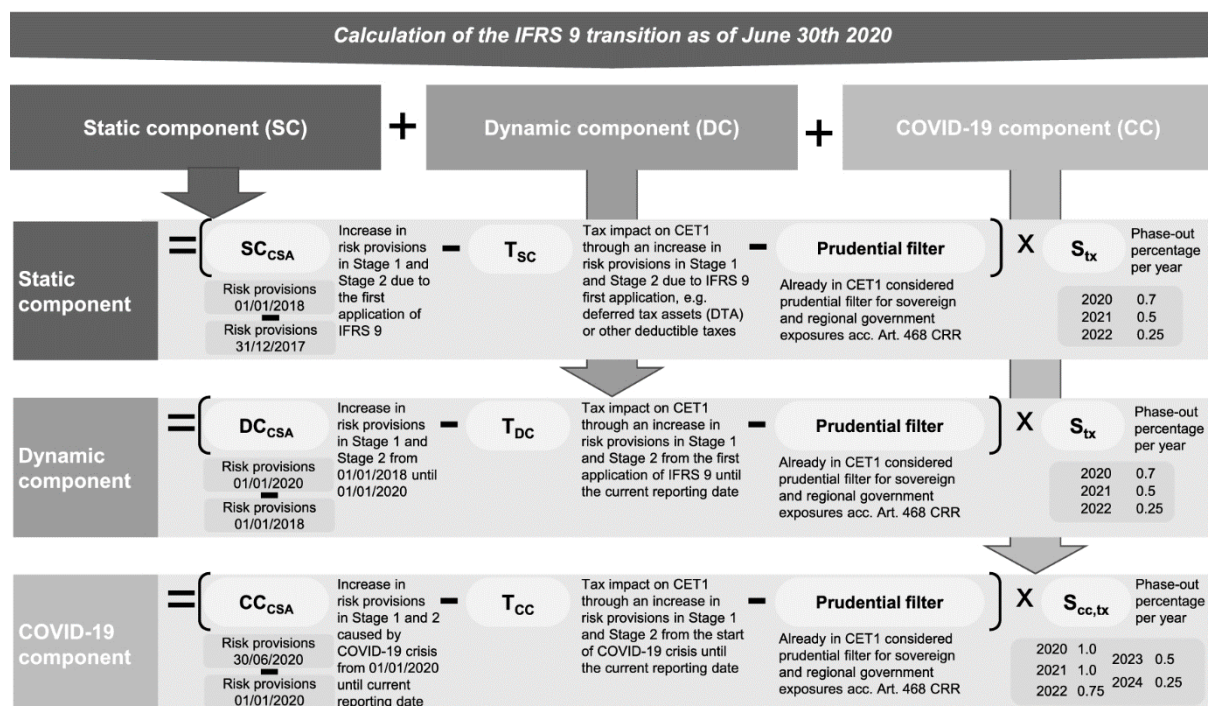
Year	2018	2019	2020	2021	2022
% of Loss Provisions due to IFRS 9 that banks are allowed to include to CET1 Capital	95%	85%	70%	50%	25%

More specifically the amounts that the banks are allowed to add back to CET1 capital can be split in two parts:

- The “static” amount: the difference after tax in provisions that result from the transition to IFRS 9 and the IAS39 provisions as of 31.12.2017
- The “dynamic” amount: the provisions after tax at the end of each year if they exceed the amount of corresponding provisions at 1.1.2018 (initial date of application of IFRS 9). These provisions are related to as the expected impairment losses based on the 12 month expected credit losses – “Stage 1” and the lifetime

expected credit losses – "Stage 2" excluding credit impaired financial instruments – "Stage 3".

(Neisen Martin, 2021) provide a nice overview of the IFRS 9 transitional provisions:



Please note the graph includes the COVID-19 component that was added as part of the CRR2 quick fix (Council Regulation 2020/873, 2020) in response to the COVID-19 pandemic. As this amendment to the legislation was done in June 2020 only 2 periods of COVID-19 component reporting are included in our dataset and since government loan moratoria were in place during that period the effect is expected to be minimal for the purposes of our analysis.

### **3.2 The data**

Primarily, the data published by the European Banking Authority on its website as part of the EU-wide transparency exercise will be used. This dataset collected usually annually, provides bank-by-bank data at the highest level of consolidation on capital positions, risk exposure amounts and asset quality across 27 countries in the European Economic Area (European Banking Authority, n.d.). As per EBA’s statement the aim of publicising this information is to restore confidence, foster market and supervisory discipline and ultimately at promoting financial stability.

This publication complements the credit institutions’ Pillar III requirements for disclosure and is based on the Supervisory Reporting undertaken by the banks, thus the data quality of it should be very good. The dataset comprises of key datapoints per institution as per specific reference dates (usually end-of-quarter) starting from 31/12/2012 up to 30/06/2020. Thus it covers the point in time where IFRS 9 became applicable for European banks (1/1/2018).

With regards to Greek banks, it contains information on the 4 biggest Greek-based banking institutions, namely Alpha Bank S.A., Eurobank Ergasias Services and Holdings S.A., National Bank of Greece S.A. and Piraeus Bank, S.A.. This group of 4 banks are also called “systemic”, in the sense that if the bank were to disappear from the market, it might have the potential to destabilise the economy ( (Bank of International Settlements, 2019)). Due to this fact, this group of four is directly supervised from the European Central Bank since the inception of the Single Supervisory Mechanism at 2014. The Greek banking system is a highly concentrated one. As indicated in the report “Study on the financial sector in Greece during the economic adjustment programmes: 2010-2018“, this group of 4 reached a 94% market share in 2018 (compared to around 70% in 2008) through the consolidation of the banking system in the aftermath of the financial crisis. Therefore, by focusing on these 4 banks we attain an excellent coverage of the Greek banking sector.

The dataset includes specific datapoints on the capital composition, risk exposure amounts and asset quality as reported by the banks as part of the supervisory reporting (reference 680/2014). In our analysis we will analyse and compare the relevant datapoints that will assist us in the analysis of the impact of IFRS 9 on the 4 systemic Greek banks in particular.

An additional source of information will be the Pillar III regulatory disclosures that credit institutions in the EU are required to publicise in their corporate website. These disclosures are mandated by Part Eight of Regulation (EU) No 575/2013 commonly referred to as the CRR and are further refined by EBA Guideline EBA/GL/2016/11. The EBA Guideline provides specific formats for certain tables and guidance on certain disclosures this enhancing the comparability and consistency of banks' disclosures. This further promotes market transparency and facilitates researchers' work on understanding the effect of policy changes to the banks' financials like this dissertation.

Specifically, for our use case, it will allow the study of key financial figures for the 4 aforementioned institutions in a full quarter-on-quarter time series addressing the period data gaps (namely: 31/03/2018, 30/09/2019, 31/12/2019, 30/09/2020) if only the EBA transparency data were used. Moreover, the breadth of the information is wider and includes narratives that can explain the business decisions and rationale behind these financial figures. Even though each bank uses its own presentation layout, by focusing on figures that are defined by EBA/GL/2016/11 we can ensure the comparability between different institutions.

### **3.3 The Status of the Greek Banking Sector at the time of IFRS 9 adoption**

Having set the framework that applies for the transitional arrangements for the adoption of IFRS 9, the focus will be on how this was applied by the 4 significant Greek credit institutions over the period 2018 to 2020 which constitutes the main part of this dissertation.

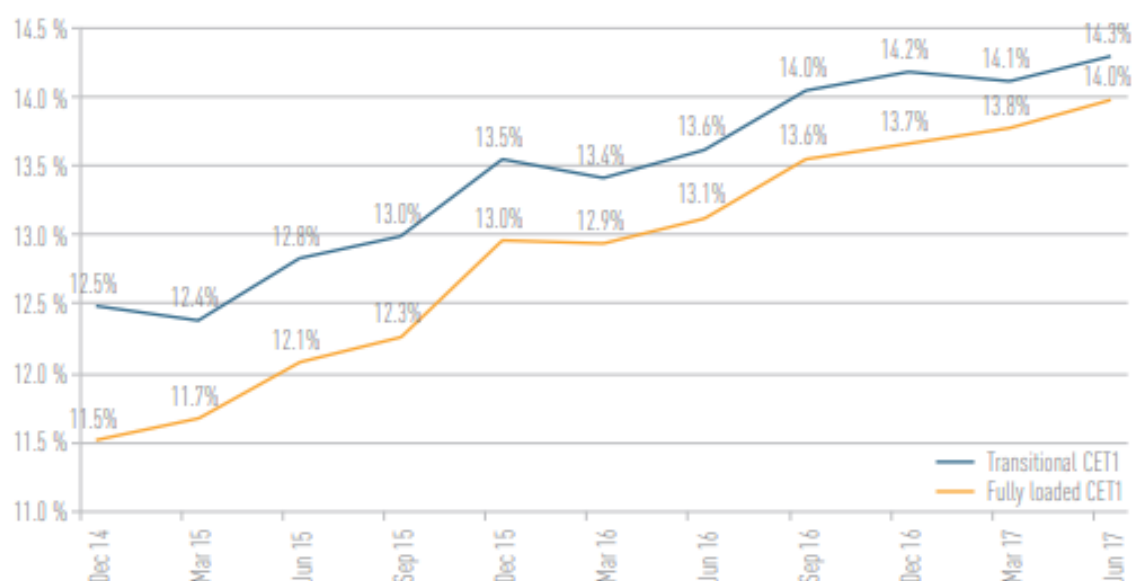
Following the Great Financial Crisis and Greek Sovereign Debt Crisis, Greek banks were heavily directly impacted by the PSI. Moreover, the downward spiral of the Greek GDP as a result of the reforms and austerity measures that followed, led to the piling up of non performing loans, making Greece the top country per NPL Share in the EU with more than 40% of the loan portfolios classified as NPL. (44.95% on 31/12/2017 as per the EBA Transparency Exercise)

All 4 institutions chose to make use of the transitional rules from the start (January 2018), as evident from their Pillar 3 disclosures.

Before delving in the actual effect primarily on Supervisory Capital Ratios, let's have a look at the starting point, the key capital ratios as they stood on 31/12/2017 as per the EBA transparency exercise.

Please note that the capital ratios as of 31/12/2017 both as fully phased-in or transitional. This distinction refers to transitional arrangements relating to the treatment of minority interests in CRR/CRD that were phased out post December 2017. Thus in 2018 the difference between fully phased-in and transitional should become negligible. As it can be the EU average of the difference between the fully loaded and transitional CET 1 was 1% in June 2014, shrinking to 0.3% in December 2017 as can be seen in the (European Banking Authority, 2017)





As of 31/3/2018 the transitional vs fully-phased in definitions for CET1 capital refer to the IFRS 9 transitional arrangements that have been explained in the previous chapter.

	Transitional			Fully phased-in		
	CET1 Capital	RWAs	CET1 %	CET1 Capital	RWAs	CET1 %
<b>Alpha</b>	8,994	49,060	18.3%	8,996	49,060	18.3%
<b>Eurobank</b>	6,887	38,387	17.9%	5,697	38,138	14.9%
<b>NBG</b>	6,333	37,334	17.0%	6,238	37,334	16.7%
<b>Piraeus</b>	7,711	50,981	15.1%	7,288	50,981	14.3%

Following the fact that transitional arrangements were only applicable up to 31/12/2017 we will focus our analysis on the fully phased-in figures. It is worth noting however that these transitional arrangements affect differently the Greek institutions. Eurobank shows a 300 bps difference whereas the difference is more mute for the other institutions; namely 80bps for Piraeus, 30 bps for NBG and virtually no effect for Alpha.



With respect to their capital position, Alpha was the best capitalised bank on 31/12/2017 with a CET1 of 18.3%, followed by NBG at 16.7%. Eurobank had a CET1% of 14.9 and Piraeus was at the weakest capital position with a CET1% of 14.3% still though adequately capitalised. To put things into perspective the overall capital requirement for Piraeus (OCR) stood at 13.625%, consisting of:

- 8% Pillar I requirement
- 3.75% Pillar II requirement
- 1.875% Capital Conservation Buffer

An interesting observation is that even though in terms of balance sheet size at 31/12/2017 all Greek institutions were more or less at similar levels, there are important differences in terms of Risk Weighted Assets, as shown in the table below:

	<b>Total Exposure amount</b>	<b>RWAs</b>	<b>Risk- Weighting Effect</b>	<b>NPL ratio</b>
<b>Alpha</b>	60,182	49,060	82%	49%
<b>Eurobank</b>	62,130	38,387	62%	40%
<b>NBG</b>	62,079	37,334	60%	36%
<b>Piraeus</b>	65,992	50,981	77%	52%

We use the Total Exposure Amount, the denominator of the Leverage Ratio, to get a measure of the banks' exposures without any risk-weighting. Then, in order to capture the effect of the risk-weighting, the ratio of Risk-Weighted-Assets vs the Total Exposure Amount is calculated in the third column. It is apparent that 2 clusters emerge: Eurobank and NBG achieve a 40% reduction of their exposures through risk-weighting, whereas Alpha and Piraeus only a 20% reduction. This difference can be mainly attributed to 2 factors:

- Asset quality of their loan portfolios as evident from the NPL ratio (4th column); Alpha and Piraeus maintain a NPL ratio around 50%, whereas Eurobank and NBG's NPL ratio is below 40%
- Differences in the method of Risk-Weighting. Both Eurobank & NBG utilise the Internal Models for calculating credit risk requirements for parts of their loan book whereas Alpha and Piraeus only use the standardised method. It is widely acknowledged that banks utilising the internal model approach can achieve lower capital requirements, thus undertaking the burden of getting these models approved by the supervisor and maintained. This effect came under scrutiny by regulators all over the world, resulting in the introduction of the output floor in the Basel III 2017 reforms, limiting the amount of capital benefit a bank can obtain from its use of internal models relative to using the standardised approaches (Basel Committee on Banking Supervision, 2017)

The picture of the Greek banks as of 31/12/2017 can be summarised as follows:

All Greek banks had roughly the same amount of total exposures. In terms of capital, Alpha had 9bn of CET1, followed by Piraeus with 7bn, then NBG by 6.2 bn and Eurobank with only 5.6bn. As a result of the better asset quality and use of internal models Eurobank and NBG were able to show significantly better CET1 ratios than Piraeus even if they held less capital in absolute terms. All Greek banks met their overall capital requirements (OCR) and thus were adequately capitalised. All Greek banks had very high NPL ratios (much higher than any other country in the EU) but asset quality was worse for Alpha and Piraeus.

With the introduction of IFRS 9 from 1st of January 2018 all Greek banks made statements of the effect that this introduction will pose in their capital position in the financial statements of 31/12/2017. The relevant disclosures extracted from their financial statements appear in the table below:

		IAS39	IFRS 9 full	IFRS 9 transitional	IAS39 – full IFRS9 (in bps)
<b>Alpha</b>	CET1	8,994			
	RWAs	49,060			
	CET1%	18.3%	15.9%	18.3%	243
<b>Eurobank</b>	CET1	6,887	5,731	6,757	
	RWAs	38,387	37,864	38,097	
	CET1%	17.9%	15.1%	17.7%	281
<b>NBG</b>	CET1	6,333			
	RWAs	37,334			
	CET1%	17.0%	13.5%	16.5%	350
<b>Piraeus</b>	CET1	7,794	5,742	7,598	
	RWAs	47,864	45,792	47,325	
	CET1%	16.3%	12.5%	16.1%	374

As evident from the above table, the disclosures in the financial statements are not uniform. Eurobank and Piraeus provide the effect of IFRS 9 on 1st January 2018 both in terms of CET1 and RWAs whereas Alpha and NBG provide the effect only in terms of CET1%. By comparing the figures, with the disclosures made as part of the EBA Transparency exercise, we notice that all banks reported the CET1 effect using the transitional capital figures as of 31/12/2017. Moreover, there is a misalignment between the Piraeus CET1, RWA figures reported in the EBA Transparency exercise and the ones appearing in the financial statements. One probable cause is the difference in timing between the two publications. The publication of financial results usually occurs in 3-4

months following the closing of the financial year, whereas the EBA Transparency Exercise have a quite larger time to publish. The 2018 EU-wide EBA transparency exercise was published in December 2018. Thus, as explained in the data chapter, we will focus on the EU-wide transparency exercise data for uniformity of disclosures between institutions and reliability of the data as supervisory figures appearing in financial statements are often estimations and subject to revision.

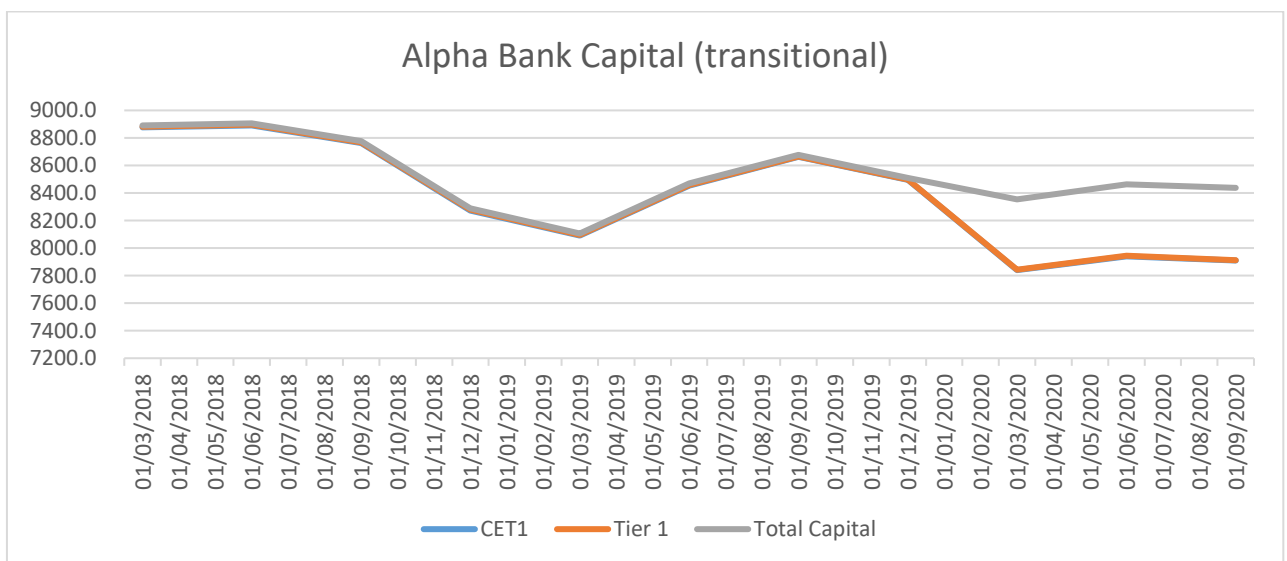
Nevertheless the data included in the financial statements provide an interesting insight on the perceived IFRS 9 impact on key supervisory metrics by the institutions themselves at the time of the introduction of IFRS 9 (1/1/2008). As the entities report the IFRS 9 impact based on the transitional arrangements that were valid until 31/12/2017 The path to the full IFRS 9 implementation will be monitored on the quarter-by-quarter evolution per each institution of key reported supervisory figures

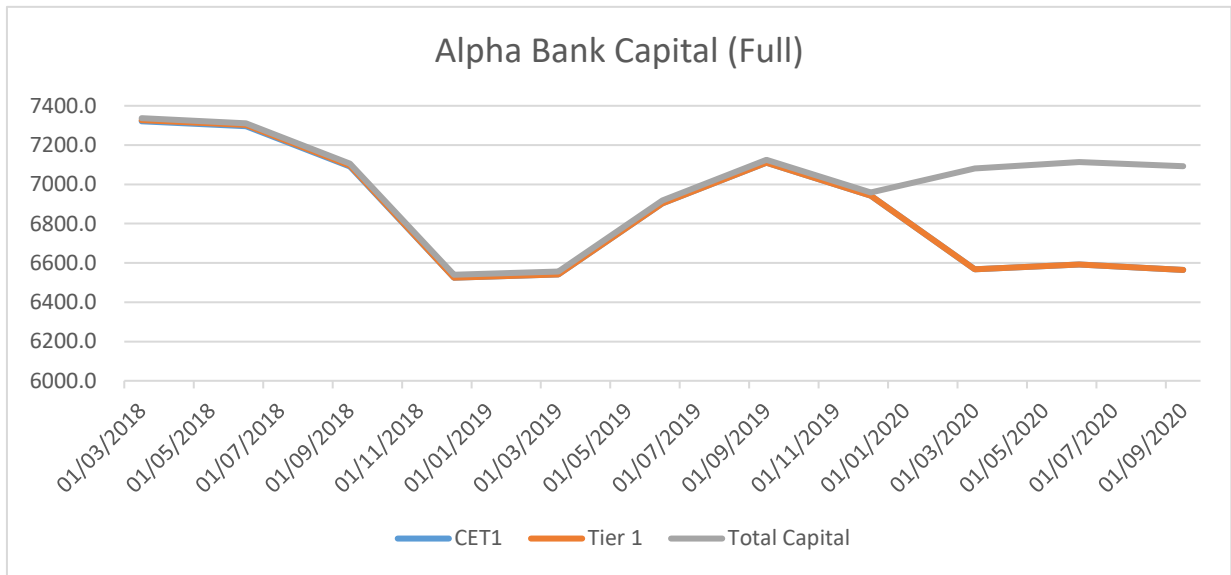
## 4 Analysis: Effects on Capital & Risk Weighted Assets (2018-2020)

### 4.1 Alpha Bank

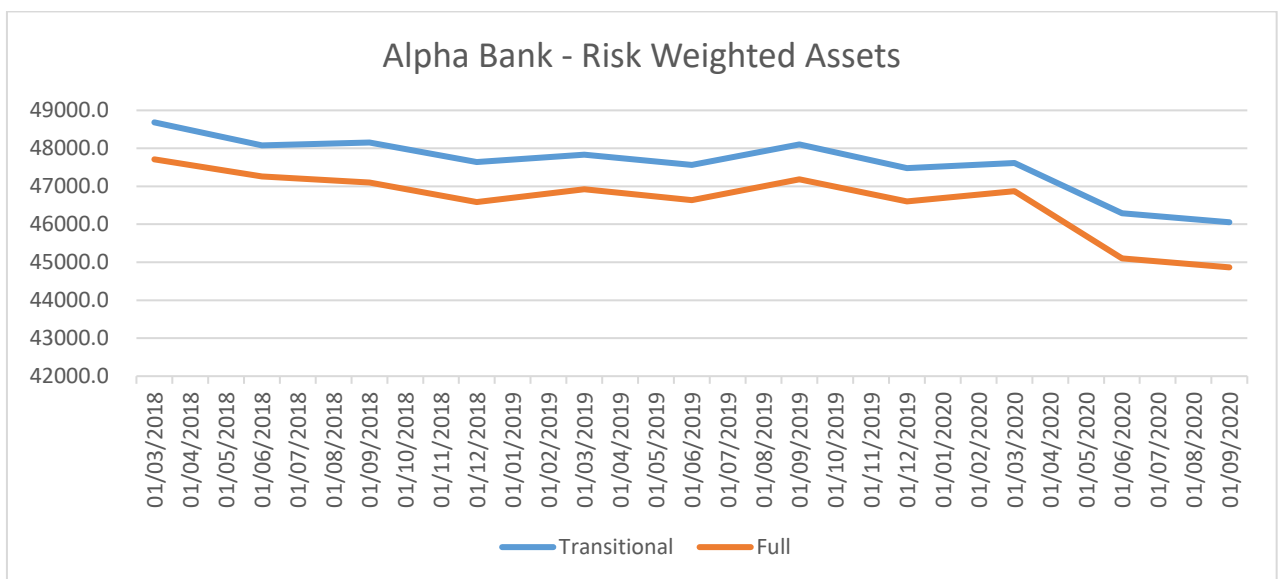
In its financial statements of 31/12/2017 published on 20/3/2018 stated that the initial IFRS 9 impact was estimated to be 243 bps (Full) or 8 bps (transitional) on CET1. This is derived from CET1 18,33% under IAS 39, 18,25% transitional and 15,9% full IFRS 9. As CET1 Capital stood at 8,996 mln EUR on 31/12/2017, the IFRS 9 effect on CET1 Capital was 1,193 mln EUR.

This estimation as provided on the 31/12/2017 financial statements is broadly inline with the figures reported following this estimation, if only a bit on the lower side. The difference between full and transitional CET1% starts at 289 bps on 31/03/2018, peaks at 316 bps on 31/12/2018 then gradually drops to 246 bps on 31/03/2020. Meaning that Alpha Bank in order to maintain its transitional CET1 ratio on 31/03/2020 under the full IFRS 9 implementation it would need to increase its CET1 capital by 1,273 mln EUR.





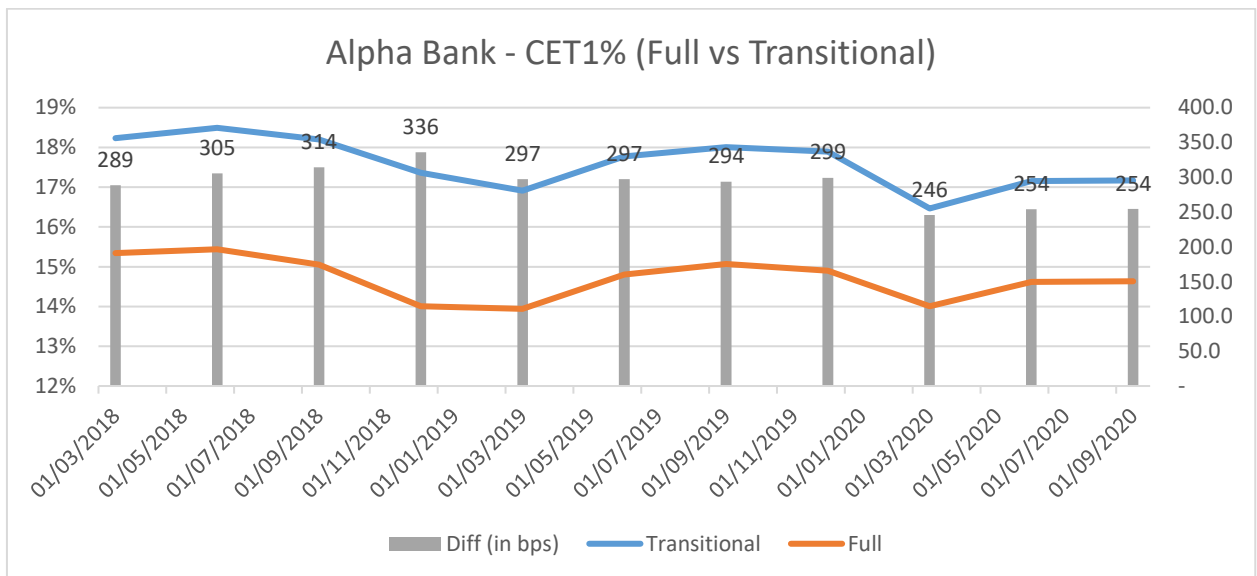
For Alpha Bank the CET1 and Tier 1 for the period 31/03/2018 to 30/09/2020 coincide, as the additional Tier 1 figures are very small. This holds true also for Total Capital until 31/03/2020 where a gap of circa 500 mil appears. This is due to the 500 mil Tier II capital that Alpha Bank successfully issued in February 2020. According to the press release "... it further strengthens the Total Capital Ratio by circa 105bps (Alpha Bank, 2020). It is also noticeable that both graphs appear remarkably similar so we will focus our interest on CET1 as any trend stemming from this time-series would apply also to Tier 1 and Total Capital.



With regards to Risk-Weighted-Assets, there is no significant difference between the trends of the transitional and full definitions and the difference between the 2 is more or less stable around 1 billion EUR. Risk Weighted Assets follow a slight downward trend that becomes a bit more steep in 2020. This trend is typical of the mild deleveraging that Greek banks are experiencing post the shocks of the immediate previous period mainly due to the non-replenishment of their loan portfolio. The sharper drop between 31/03/2020 and 30/06/2020 is attributable to a change in regulation, "the CCR2 quick fix", that in response to the COVID-19 outbreak brought sooner some favourable changes to the banks lowering the risk weights of exposures to SMEs, infrastructure entities and central bank & central government exposures denominated in an EU currency other than euro. The CRR2 quick fix effect for Alpha Bank is circa +65 bps.

Ref Date	CET1		
	Transitional	Full	Diff (in bps)
31/03/2018	18.2%	15.3%	289
30/06/2018	18.5%	15.4%	305
30/09/2018	18.2%	15.1%	314
31/12/2018	17.4%	14.0%	336
31/03/2019	16.9%	13.9%	297
30/06/2019	17.8%	14.8%	297
30/09/2019	18.0%	15.1%	294
31/12/2019	17.9%	14.9%	299
31/03/2020	16.5%	14.0%	246

30/06/2020	17.2%	14.6%	254
30/09/2020	17.2%	14.6%	254



The right y-axis corresponds to CET1%, blue line taking into account the IFRS 9 transitional arrangements that allow banks to smooth the IFRS 9 effects, whereas the orange line shows the CET1% with full IFRS 9 impact. The left y-axis corresponds to the difference between the two CET1% definitions in bps (0.01%) and is expressed with the grey bars in the chart.

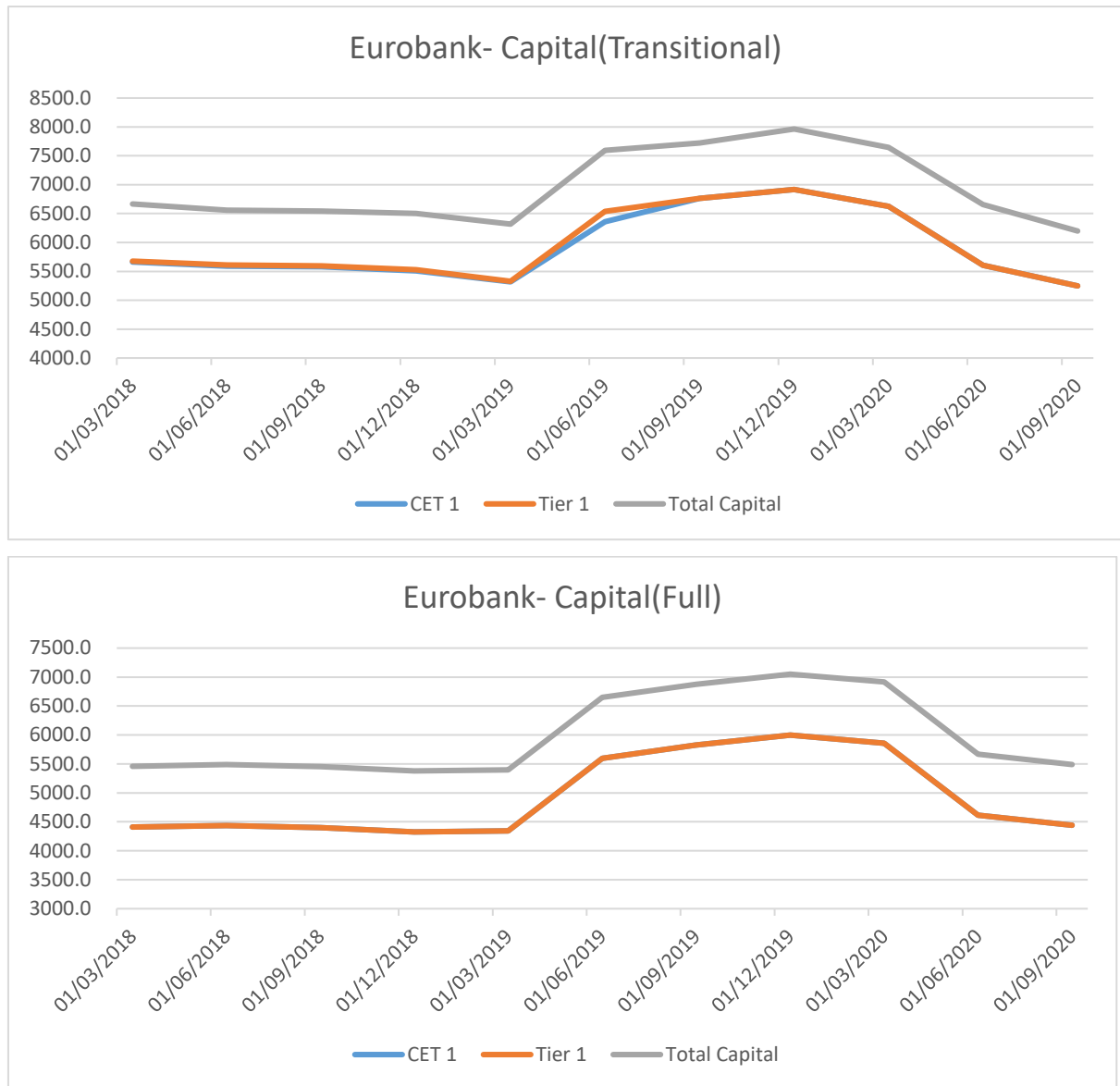
The Full IFRS 9 CET1% for Alpha gradually falls from 15.3% at the beginning of the period to 14.6% on 30/09/2020. In the same period the transitional CET1% started at 18.2% and ended up at 17.2%. The most noticeable drop for transitional CET1% happened between 31/12/2019 and 31/03/2020, when it dropped by 1.4%. This is mainly attributed to Deferred Tax Assets amortization -50bps and the IFRS change of factor from 95% to 85% by -25bps. The difference between transitional and full implementation reported at 31-03-2018 was 289 bps slightly higher than the initial effect provisionally reported as of 1/1/2019 (240 bps). Note that due to the gradual transition, the transitional figure of 31/3/2018 contains 5% of the full IFRS 9 impact. It is also noticeable that the difference increased during 2018, possibly due to increased provisions attributable to IFRS 9 (Stage 1 to Stage 2), whereas for 2019 the difference is stable around 295 bps, and 250 bps for 2020, implying that changes in the dynamic component of the adjustment are rather



minimal. The difference over the years has evolved in a very predictable manner over 2019 & 2020 following the amortization schedule, and not taking into account the COVID component for which we have not sufficient evidence, the difference is projected to gradually reduce to 175 bps in 2021 and 90 bps in 2022.

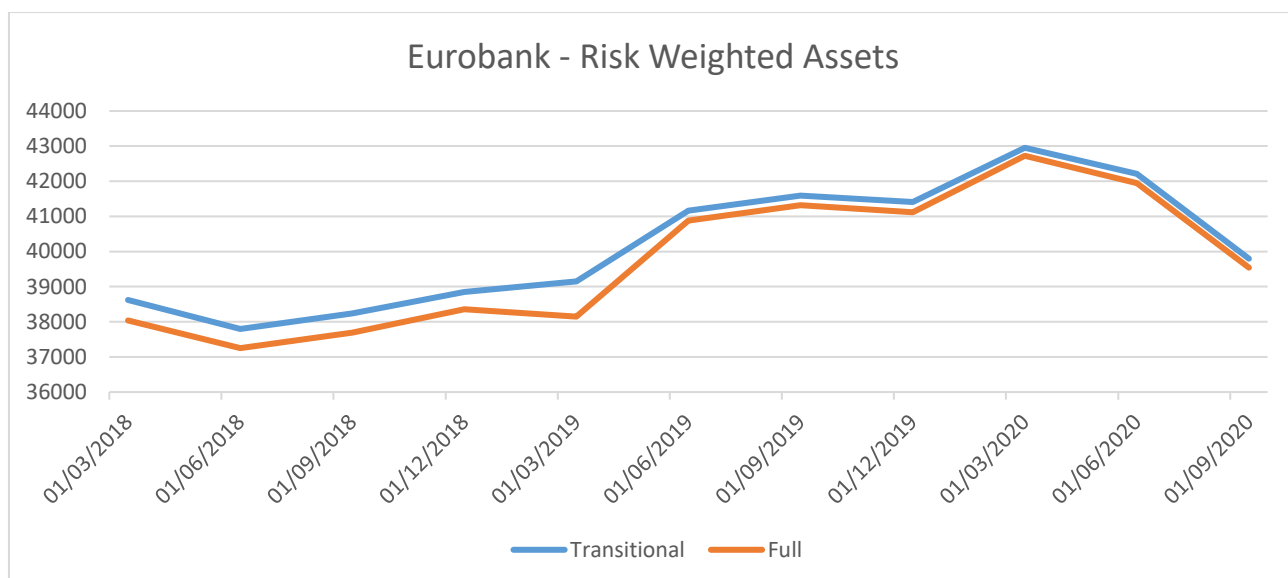
## 4.2 Eurobank

The initial IFRS9 impact on 1/1/2018 was reported at approximately 280 bps.



As evident from the graphs above for Eurobank, the CET1 and Tier 1 figures coincide for the period of investigation (31/3/2018- 30/09/2020). This means that Eurobank has no Tier 1 instruments outstanding for this period. Moreover, the difference between total capital and Tier 1 is rather stable at 1bn EUR, meaning that Eurobank has an Additional Tier 1 issuance outstanding. There are 2 significant events outlined in the above graphs. Firstly the capital benefit that Eurobank secured via the merger with Grivalia on 30/06/2019 and the cost of the de-merging & hive down event that shows up in the reporting on 30/06/2020. This was done in the context of Eurobank’s NPE reduction acceleration plan.

Effectively, Eurobank was split in two, creating a “good” bank focusing exclusively on sound loans and getting rid of the servicing of bad loans.

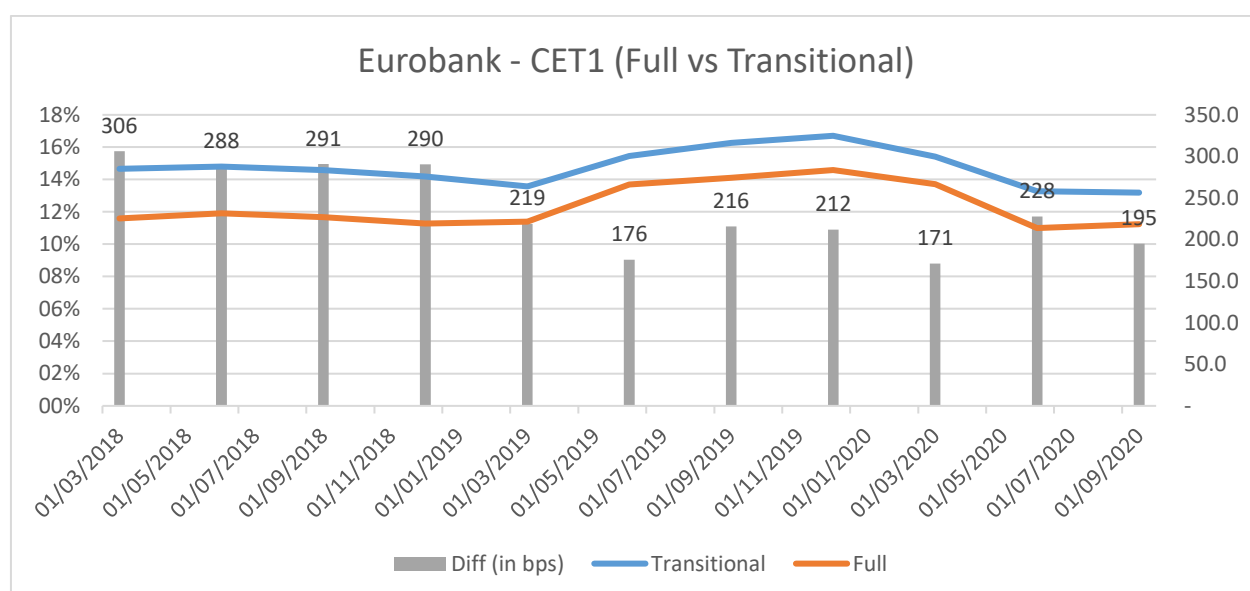


With regards to Risk Weighted Assets, the difference between the IFRS9 adjusted and the transitional figures is rather minimal and is significantly reduced on 30/06/2019 and thereafter. There is an upward trend following the 30/06/2019 reporting. This attributable to the merger with Grivalia and the securitization of NPE portfolios (Project Pillar & Cairo), where the retained notes still contribute to the RWAs . Moreover there is also a notable decrease of the RWA in mid 2020 that is attributable to the corporate transformation/ hive down plan that took place and the CRR2 quick fix effect. Moreover, through the completion of the transfer of the Cairo Class B1 securitization to noteholders, Eurobank derecognised the underlying loan portfolio from its balance sheet on 30/09/2020.

Ref Date	CET1		
	Transitional	Full	Diff (in bps)
31/03/2018	14.7%	11.6%	306
30/06/2018	14.8%	11.9%	288
30/09/2018	14.6%	11.7%	291
31/12/2018	14.2%	11.3%	290
31/03/2019	13.6%	11.4%	219
30/06/2019	15.4%	13.7%	176
30/09/2019	16.3%	14.1%	216

31/12/2019	16.7%	14.6%	212
31/03/2020	15.4%	13.7%	171
30/06/2020	13.3%	11.0%	228
30/09/2020	13.2%	11.2%	195

With regards to the derived CET1% ratio for the period under investigation the dynamics of the numerator (CET1 capital) and the denominator (Risk Weighted Assets) are in full play. The gradual small increase in RWAs was contributing to small decrease in regulatory capital ratios. This trend was abruptly stopped in mid 2019 with the merger with Grivalia that significantly strengthened Eurobank's capital position. However, the capital cost of the NPE reduction acceleration plan and the corporate transformation – hive down have had a detrimental effect on the capital ratios of the bank.

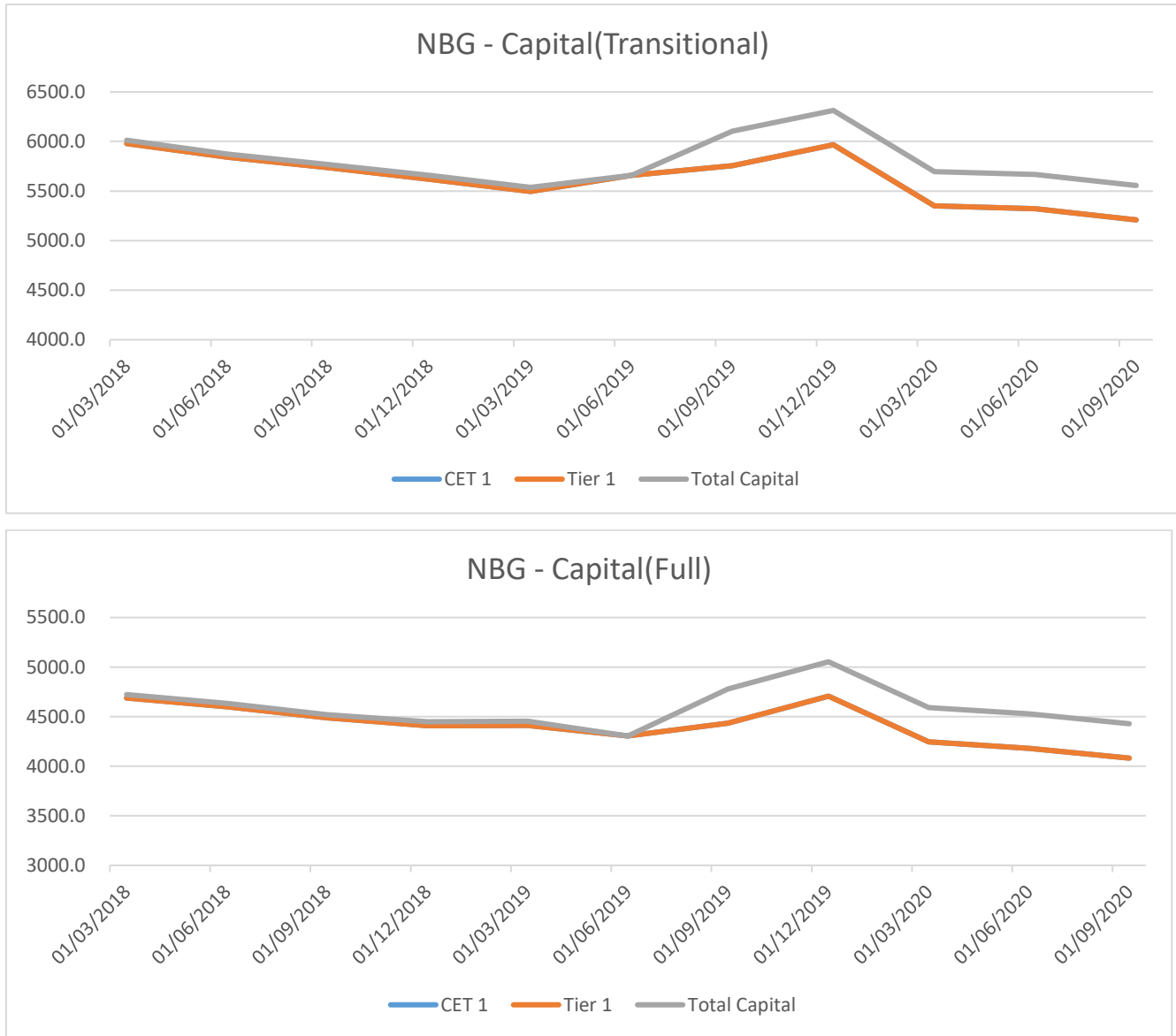


With regards to the IFRS 9 effect, it is noticeable that the IFRS9 adjustments were slightly higher than the initial estimation (~300 bps vs 280 bps). Given the corporate events analysed above, that distorted Eurobank's balance sheet during the period, we do not observe the gradual step-wise reduction of the difference between full IFRS9 and transitional CET1% as it was observed by Alpha Bank. There seems to be a significant dynamic component in the IFRS9 adjustments, as evident from the jumps of the grey bars (signifying the bps difference between transitional and full definitions) between Q1 and subsequent quarters in 2019 and 2020. Thus, it is harder to project the path of the difference for Eurobank in the coming years. Not taking into account the COVID

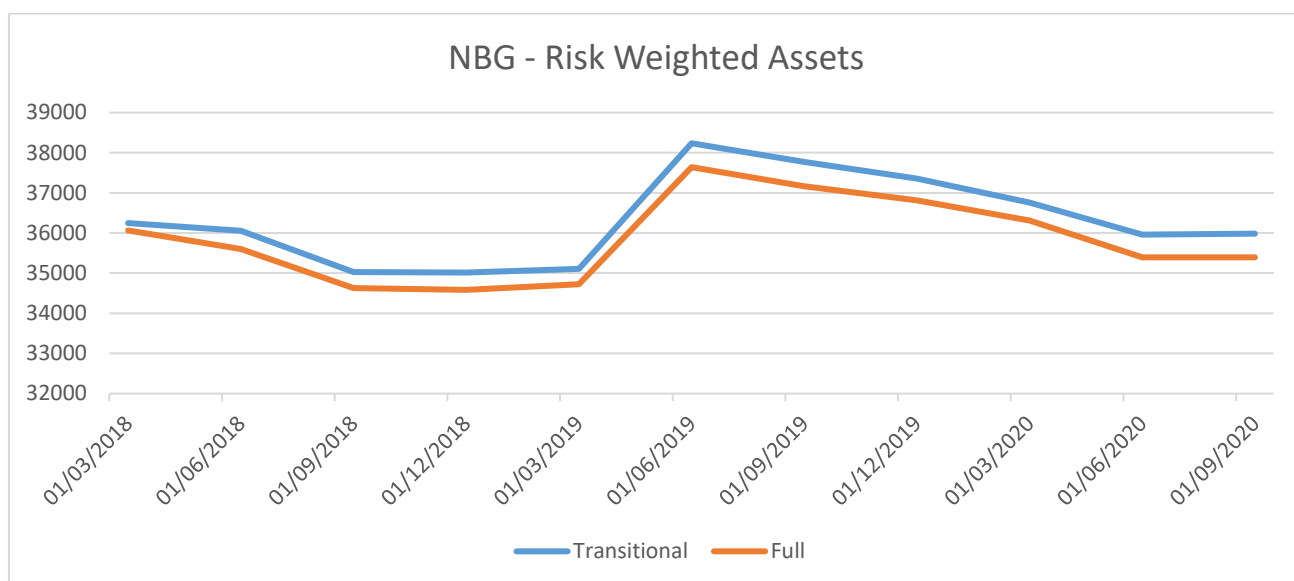
component for which we have not sufficient evidence, the difference is projected to gradually reduce to 125 bps in 2021 and 60 bps in 2022.

### 4.3 National Bank of Greece (NBG)

The initial impact of the IFRS 9 introduction was estimated at 350 bps.



Interpreting the graphs above for NBG above, it is clear that its capital structure relied on CET 1 capital up to 30/09/2019. There were no Tier 1 or additional Tier 1 instruments up to that period. On 12/07/2019 NBG announced the issuance of 400m EUR Tier 2 Notes that strengthen its total Capital position (National Bank Of Greece, 2019). This was the only noticeable capital event in the period of investigation. NBG's capital follows a generally small downward trend with a slight increase in the second half of 2019, mainly due to the sale of subsidiaries, most importantly NBG Pangaea REIC. In the past NBG's participation in Pangaea was deduced from CET1 (Equity Method investments), so the sale of the company had a significant positive capital effect.

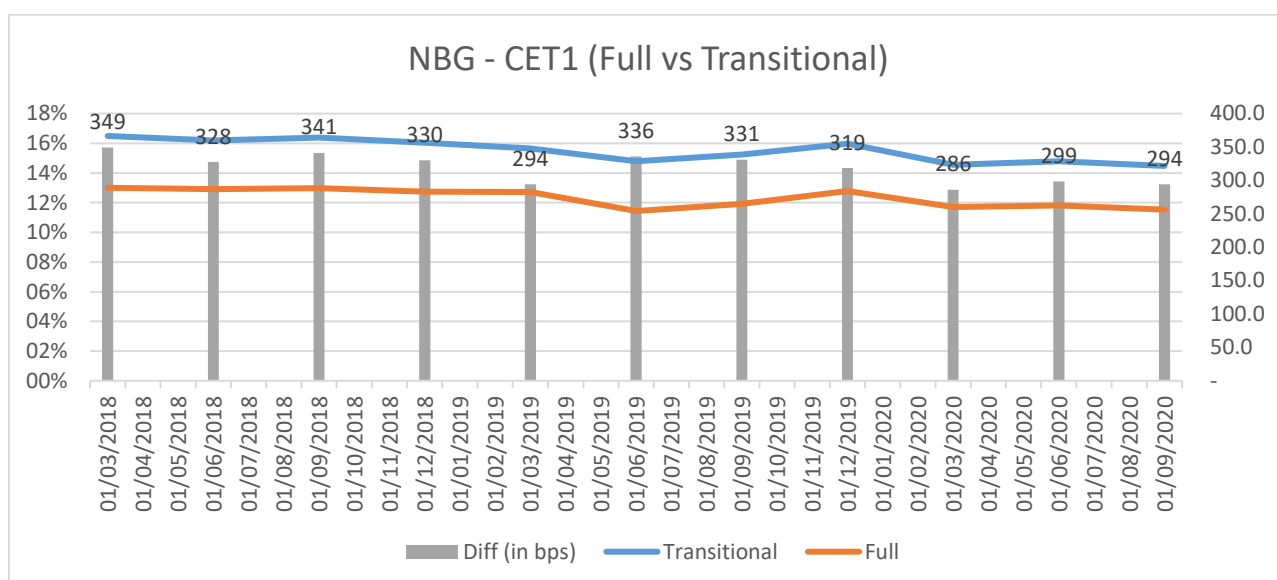


With regards to NBG’s risk weighted assets, the differences between the transitional and full IFRS definitions are rather small, less than 2%. There is a notable increase in RWAs on 30/06/2019, due to the reversion to using the standardized approach for credit risk, that was permitted by NBG’s supervisor, the ECB, on 21st May 2019. The rationale, put forward by the institution, was to make RWAs evolution more stable and predictable, relieve the Bank from the operational burden of maintaining internal models and allowing the bank to focus on the reduction of the non-performing exposures, which was highlighted as one of the most pressing issues in the coming years. As an overall trend, RWAs follow a slowly downward trend, but the CRR2 quick fix effect in 2020Q2 is not so pronounced as for the other Greek banks.

CET1			
Ref Date	Transitional	Full	Diff (in bps)
31/03/2018	16.5%	13.0%	349
30/06/2018	16.2%	12.9%	328
30/09/2018	16.4%	13.0%	341
31/12/2018	16.0%	12.7%	330
31/03/2019	15.7%	12.7%	294
30/06/2019	14.8%	11.4%	336
30/09/2019	15.2%	11.9%	331
31/12/2019	16.0%	12.8%	319

31/03/2020	14.6%	11.7%	286
30/06/2020	14.8%	11.8%	299
30/09/2020	14.5%	11.5%	294

Having examined the constituents of the CET1% ratio we focus on the evolution of the ratio itself during the investigation period. The CET1% ratio has followed a downward trend; sinking 200 bps in transitional terms and 150 bps in full IFRS 9 terms. There is a notable dip on 30/06/2019 due to the transition from IRB to standardised approach for calculating capital requirements for Credit Risk, which was subsequently subdued by the sale of subsidiaries, but the downward trend continued in 2020, mainly due to losses incurred and the cliff effect of IFRS9 transitional arrangements.

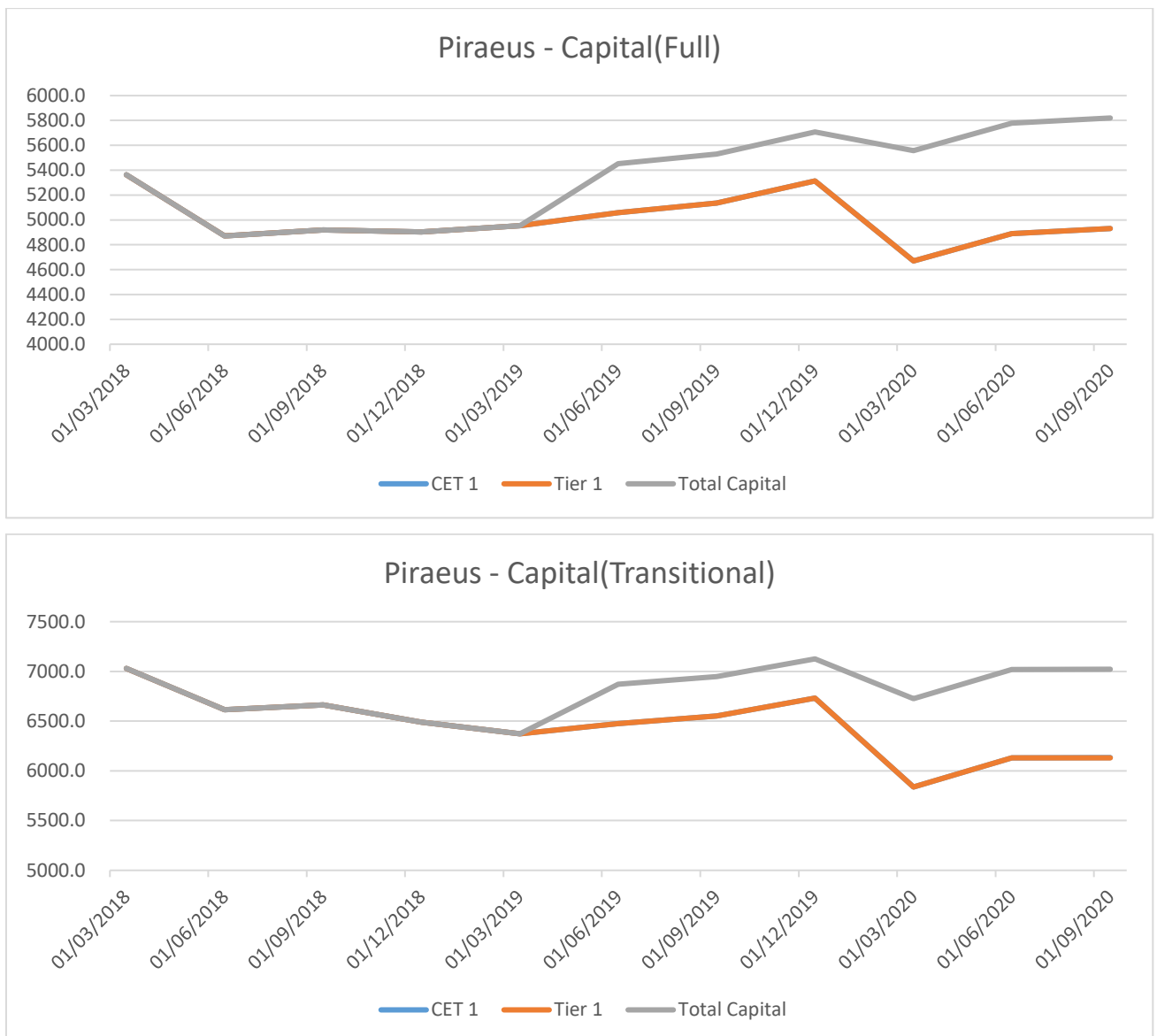


At first glance the estimation on the initial IFRS impact for NBG at 350 bps was a good estimate. The concerning issue that the difference between Full IFRS9 and transitional has remained consistently above the 300 bps, implying that the cliff effect will be higher in subsequent years. Not taking into account the COVID component for which we have not sufficient evidence, the difference is projected to gradually reduce to 200 bps in 2021 and 100 bps in 2022, so the negative effect of the IFRS 9 adjustments to its capital ratio will be sharper than the ones projected for Alpha and Eurobank.



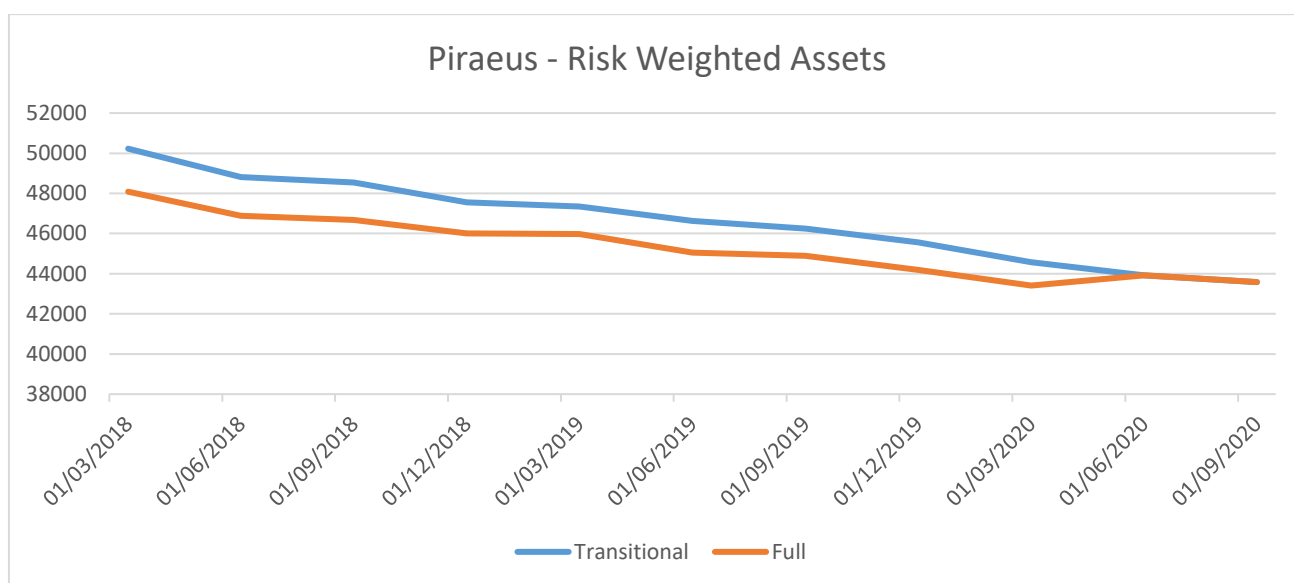
#### 4.4 Piraeus Bank

For Piraeus the IFRS 9 one-off estimated impact on CET 1 was 1.6 billion EUR as reported in the financial statements of 31/12/2017 or 374 bps in percentage terms. This was the highest value amongst its peers mainly due to the bad asset quality of its loan portfolio, that in a way was acquired with the streak of acquisitions that took place in the aftermath of the Greek financial crisis.



The Piraeus capital structure shows great commonalities with the NBG one. Its capital structure consists of solely CET1 until 30/06/2019. As evident from the separation of the Tier 1 and Total Capital lines, Piraeus issued two Tier 2 instruments in this period: 850 mil EUR on 19/06/2019 and 500 mil EUR on 13/2/2020. This allowed Total Capital to remain

stable over the period, but there is a downward trend in CET1 capital in the period under investigation where CET1 capital decreased around 1 bil EUR in transitional terms and 1.4 bil EUR in full IFRS 9 terms. The notable drop in capital that is observed in the first quarter of 2020, according to the Pillar 3 report of the institution can be attributed to regulatory adjustments to CET1 capital mainly intangible assets, goodwill, deferred tax assets, minority interests and IFRS 9 transitional arrangements. Unfortunately, the report does not provide additional breakdowns to assist in further understanding this drop.

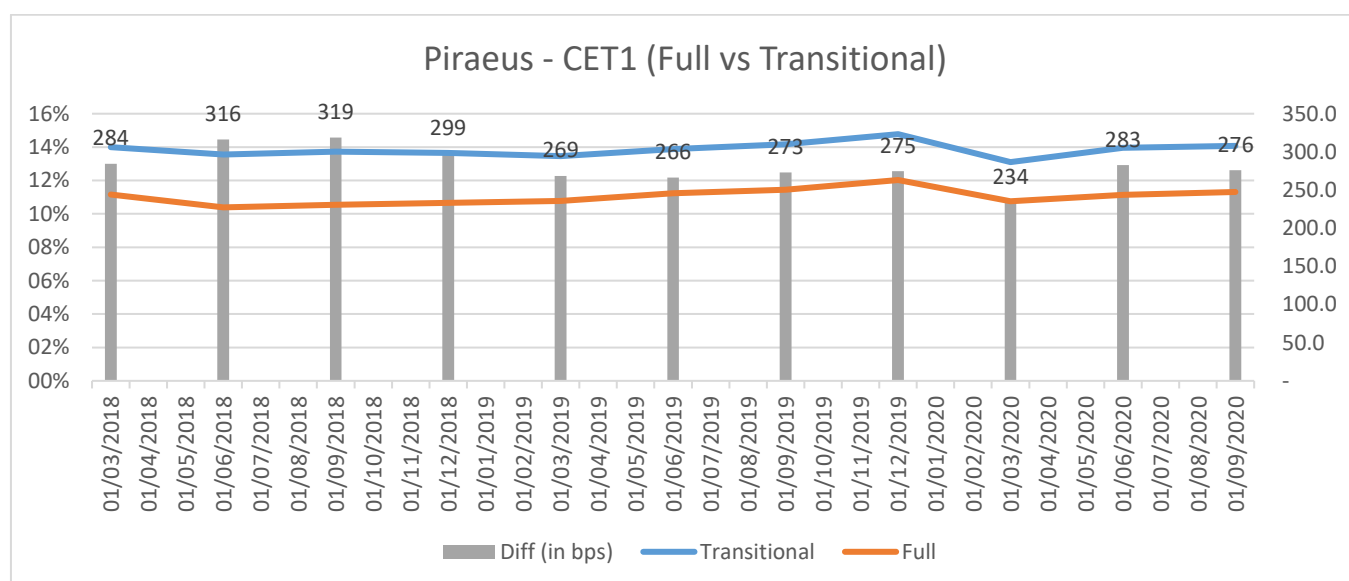


In terms of risk weighted assets Piraeus shows a very consistent picture of decreasing downward trend in risk weighted assets, consistent with the deleveraging of the bank and the aging of its portfolio without significant provisions of new debt. Interestingly, as also experienced in the NBG case, there is no significant gain from the CRR2 quick fix.

Ref Date	CET1		
	Transitional	Full	Diff (in bps)
31/03/2018	14.0%	11.2%	284
30/06/2018	13.6%	10.4%	316
30/09/2018	13.7%	10.5%	319

31/12/2018	13.6%	10.7%	299
31/03/2019	13.5%	10.8%	269
30/06/2019	13.9%	11.2%	266
30/09/2019	14.2%	11.4%	273
31/12/2019	14.8%	12.0%	275
31/03/2020	13.1%	10.8%	234
30/06/2020	14.0%	11.1%	283
30/09/2020	14.1%	11.3%	276

Therefore it is no surprise that the CET1% ratio has remained relatively stable over this period, as both numerator and denominator follow a similarly downward trend.



With regards to the IFRS 9 impact, it seems that the initial impact assessment of 374 was a bit on the high side. After the initial quarter of 2018, the IFRS9 difference stabilised around 320 bps in 2018, falling to 270 bps in 2019 and 235 bps in the first quarter of 2020.

There has been increase in the following two quarters of 2020 possibly due to the additional COVID-19 component, that was recently added. Not taking into account the COVID component for which we have not sufficient evidence, the difference is projected to gradually reduce to 170 bps in 2021 and 85 bps in 2022, so the negative effect of the IFRS 9 adjustments to its capital ratio will be very similar to the one of Alpha Bank

## 5 Conclusion

The effect of the adoption of the IFRS 9 standards, especially with the gradual affect as foreseen by the legislation to key supervisory metrics such as the CET1 Capital Ratio and Risk-Weighted-Assets for the 4 systemic Greek banks was examined. All 4 banks maintained their key capital ratios at adequate levels during the period of investigation (1/1/2018-30/09/2020) well above the minimum requirements set by the supervisory authorities. (European Cantral Bank)

Nevertheless there are significant differences among different Greek banks on the level of available capital and on the capital depletion gradually suffered by the adoption of IFRS 9. Alpha Bank and, to a lesser extent NBG, had higher capital ratios at the outset of the IFRS 9 adoption than Eurobank and Piraeus. With regards to the capital depletion still to be suffered in 2021 and 2022, Eurobank is in a better position as the projected difference between the fully-loaded CET1% capital ratio and the transitional is expected to be 125 basis points in 2021 and 60 in 2022. Whereas, the same difference for the other 3 institutions it is expected to be 170-200 bps in 2021 and 85-100 bps in 2022 with the bank facing the bigger adjustment being NBG.

As evidenced by the data, no Greek bank faced a solvency issue (its capital ratio being too low) due to the adoption of IFRS 9. But they all faced capital depletion due to it and significantly higher than the average figures for European banks calculated by the European Banking Authority before the implementation. The crucial part of the legislation was the gradual adoption, ensuring that all EU institutions had sufficient time to tap the financial markets for additional capital without aggressively competing with one another offering high yields to attract investors. This transitional period gave time to Greek institutions to raise capital multiple times and take advantage of the falling yields of Greek Government Bonds (GGBs) in 2020 -2021 due to the participation of GGBs in ECB's PEPP Programme. So far 2 institutions have performed capital increases in 2021 Piraeus and Alpha Bank. However, a new challenge awaits the Greek banking system capital-wise as indicated also in the Bank Of Greece's Annual Monetary Policy Report 2020-2021 in

June 2021: Capital ratios of Greek institutions have fallen slightly but still remain at satisfactory levels (Bank Of Greece, 2021). The problem lies in the quality and not in the quantity; 65% of the core capital is Deferred Tax Credits, given by the Greek State in the aftermath of the PSI, which are not considered good quality capital. As all Greek institutions currently embark programs to further reduce their NPL ratios the Deferred Tax Credits percentage could also increase in the future.

Conclusively, due to gradual effect of the IFRS 9 transition Greek institutions have managed to overcome the associated capital depletion; however further moves are required to further enhance the quality of their capital.

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