

## The significance and impact of the time and cost of (non-)collecting claims on receivables from non-performing bank loans (NPLs)

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### Abstract

*The aim of this article is to reveal the importance and the impact of the time and the cost of (non)collecting claims on receivables for the internal rate of return (IRR) of a portfolio of non-performing loans (NPLs). In the first part of the article the Greek legal framework, related with the rules of the compelled collective receivables from NPLs, is described. Then, the article presents an overview of the regulatory framework concerning the loans' collaterals, provided by the mandates of Basel II (2006) and Basel III (2011). In order to reveal the significance of the time and the cost of collecting receivables for the determination of the discount rate of the non-performing loans of the systemic banks, the article presents: a) a model of the internal rate of return (IRR) valuation concerning an NPL portfolio and b) an analogous sensitivity analysis. Finally, in the last part of the article, there are some conclusions related with the consequences from delays in collecting claims on receivables from the loans of the banking system.*

*Keywords: Non-performing loans (NPLs), Greek legal framework of compulsory claims on receivables, sensitivity analysis.*

### 1. Introduction

The Greek debt and the high level of the non-performing loans (NPLs) of the Greek banking system, as un-

derlined in almost all the recent reports of the major international organizations (e.g., OECD, IMF, EU), are considered as high priorities for the country. As regards to the first (debt), its decline (with respect to the Greek GDP) will require a dynamic increase of the country's potential output. But such improvement requires a structural reforming "verve", in order to lift all the malfunctions of the past which negatively affected the economic momentum of the country. On the other hand, the NPLs, at the beginning of 2018, remain high, as a percentage of total loan portfolios (almost 45%). This high level of NPLs creates a negative atmosphere for the expansion of a bank's credit growth. Thus, the gradual relief of the Greek banks from their NPLs is considered as a major prerequisite for the creation of a credible capital adequacy for the system. In this context, the new institutional framework, concerning the claims of receivables from NPLs, has a prime role in the acceleration of this process. Actually, this new institutional framework is expected to help the "governability" of the banks by reducing the direct and indirect costs related to their attached NPLs.

In Section 2 of this article, an overview of the legal framework concerning the collecting claims on receivables in Greece is presented. Then in Section 3, the regulatory framework, provided by the Basel II (2006) and the Basel III (2011), concerning the loans' collaterals, is discussed. In Section 4, with the help of a mathematical model, we discuss the effects of the implementation of this legal framework on the internal rate of return (IRR) of a problematic loan portfolio. Finally, in Section 5, we present some inferences regarding the consequences from the delays of implementing the collecting claims of receivables laws on Greek banks' NPL portfolios.

### 2. The legal framework of the collecting claims in Greece

Banks use various techniques to reduce or mitigate the credit risk of the granted loans. For example, a loan could be secured partially or entirely with cash or shares, with a guarantee from a third party or with oth-

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er financial products. Depending on the kind of credits provided by credit institutions, they are secured mainly by registered interests and personal securities. More analytically:

a) Pursuant to the Greek Civil Code (CC), mortgage (article 1257 et seq. CC) and pledge (article 1209 et seq. CC) are forms of collateral security, though mortgage prenotation (article 1274 et seq. CC), which constitutes a mortgage under condition, is of a significant practical importance. Mortgage, as well as mortgage prenotation, is entered on a real estate property owned by the debtor or a third person, who agrees to provide security for the debtor. Mortgage (or mortgage prenotation), which is entered on an industrial real estate property, includes machines, utensils and tools intended for it (articles 959, 1282, 1283 and 1306 no. 5 CC), irrespectively of whether they existed at the time of the entry of mortgage or were added later, with the condition that they belong to the owner of the real estate property. It must be noted, too, that, according to the specific Law no. 4112/1929, mortgage (and not mortgage prenotation) on an industrial real estate property includes machines, irrespectively of whether they belong to the owner of the real estate property in mortgage or not.

b) It is common in banking practice, and especially in credit agreements of open joint account, that every nominal claim of the debtor constitutes an object of a pledge against a third party, according to the articles 35 et seq. of the Legislative Decree 17.7/13.8.1923 “on special provisions concerning Sociétés Anonyme”. In this case, the pledge on the claim results in the assignment of the latter to the creditor, who becomes the real and sole beneficiary of the claim, having thus the right to collect it (articles 39 and 44 of the abovementioned Legislative Decree). A more specific case of pledge on a claim is the pledge on a debtor’s bank account or the pledge on mutual funds units, which both result in the assignment of the claim, too, due to the application of the abovementioned Legislative Decree. Pledge is also constituted on order titles, mainly on bills of exchange, checks and repositories of general warehouses, by being endorsed to the banks and delivered to the latter, according to the respective articles of the Greek Civil Code and the provisions of securities law. In the past, before the outbreak of the financial crisis, a large number of credit agreements of open joint account were secured by endorsements of order titles. In practice, the constitution of a pledge on shares of a corporation listed on a regulated market was common, too. There is also the notional pledge (pledge without delivery) of Law no. 2844/2000, in cases that businesses or self-employed persons are the debtors,

as a more modern form of security which serves better its security purposes in comparison to the simple pledge, as the material delivery of the pledged is not required. It is mainly imposed on several professional equipments and goods.

c) In addition, personal securities include guarantees of partners, as well as of third persons in relation to the debtors, who, according to the terms of the respective agreements, are jointly and severally liable with the debtors, with their whole property, movable and immovable.

From the above brief analysis of the forms of securities for banks’ claims, it is readily understood that the “selling” value of a loan depends on many factors, including the form of security that the bank has chosen for being secured, either prior to the granting of the loan or during later arrangements. It has to be noted herein that, practically, the value of a loan depends, mainly, on the securities on real estate property owned by the debtors and the guarantors, as pledges resulting in assignment of claims (namely pledges on bank accounts, mutual funds units etc.), have, in their majority, already been collected by the banks in their own effort to recover part of the non-performing loans. Additionally, the proceedings of a forced collection of old pledged checks and bills of exchange have almost been legally completed by the banks, without being significantly successful, due to the years-long growing financial crisis. The attempt of collecting invoices or other claims (future or not) that had been assigned to the banks by their debtors had the same conclusion. With respect to the pledge on shares, provisions concerning a simple pledge are applicable proportionally and, consequently, the proceedings of forced execution on movable property can take place, where more specific provisions concerning Sociétés Anonymes listed in a regulated market are applicable in special cases. As a result, forced execution regarding pledged shares takes place with the same proceedings, regarding time and cost, as the forced collection of claims secured by a simple pledge on movable property.

The ancillary rights of banks (in which collateral and personal securities are included) as well as all rights connected with them are assigned to loans and credit acquisition companies, with sale as a legal base, for the collection of the overdue debts, which is to be pursued either extrajudicially or in the context of the enforcement procedure provided. The majority of forms that these rights have leads –inevitably– to an approximate enlargement, as far as this article is concerned, of the time and cost required for the forced collection of a claim, as functions that affect the recovery of the total or part of the claims arising from bank loans and credits.

Prior to the forced selling of the claims, the proceedings provided by the Code of Conduct of Law no. 4224/2013 must be completed, in case that the latter had not been completed by the credit institution before the transfer of the claim (article 3 par. 2 sentence b of Law no. 4354/2015), unless the debtor has already been characterized as “non-cooperative”. As part of the implementation of the Code of Conduct, claims management companies have the obligation to seek and find the best solution for the voluntary restructuring or rearranging of the debt. The total time that is required, though, for the completion of the proceedings provided by the Code of Conduct, depends, mainly, on the stage at which the proceedings were at the time of the transfer of the claim to the claims acquisition company; on whether the debtor is a legal entity or a person; on whether he is “cooperative” or not or, in this last case, on the stage at which he became “non-cooperative”; on whether the legal entity-debtor has an annual turnover not exceeding the amount of €1,000,000, etc. For example, if the credit institution, prior to the transfer of the claim, had sent to the debtor only the first letter of formal notice, the total duration of the implementation of the proceedings provided by the Code of Conduct, when it is leading to an arrangement or final settlement solution with the cooperative debtor, is calculated, at the minimum, from three to six months, depending on whether the debtor is a person or a legal entity. However, negotiations for finding the best solution, provided that such a perspective exists, last, in particular cases, much longer, especially in cases of medium or large enterprises, where the Code of Conduct proceedings are not required to be exhausted in their formal part regarding letters of formal notice as well as the subsequent proceedings.

### **Legal actions for implementing the collecting receivables**

If, however, the application of the Code of Conduct does not lead the parties to a debt settlement agreement or to the finding of a final settlement solution, then the company has to take legal actions for the forced collection of the claim. The first action, after the termination of a loan agreement, is to pursue of the award of the claim by the issuance of an order for payment, which is preferred in comparison to the lawsuit filed in the regular proceedings of the Greek Code of Civil Procedure, as, on the one hand, the order for payment constitutes an enforceable title and, on the other hand, its issuance has a cost lower than the lawsuit. To the extent that the lawsuit is filed only exceptionally, mainly when the claim cannot be proved by docu-

ments, we are going to refer herein only to the order for payment, indicating the possibilities that it offers as an enforceable title, as well as to the direct and indirect cost of it and of the ancillary actions based on it. It is furthermore noted that the provisions applicable to the orders for payment issued after January 1, 2016 are those of the new Law no. 4335/2016, while the orders for payment issued until December 31, 2015 are governed by the previous law.

According to the new provisions of the Greek Code of Civil Procedure (CCP), the judge of the country court is competent for the issuance of an order for payment, with respect to the claims of the county court jurisdiction, namely claims of an amount not exceeding €20,000. With respect to any other claim of an amount exceeding €20,000, the judge of the Single Member Court of First Instance (articles 14 and 625 CCP has jurisdiction). The territorial jurisdiction of a court determines, to a large extent, the time of the issuance of the order for payment, after the filling of the application for its issuance. In the Athens and Piraeus county court and Single Member court of First Instance, orders for payment are issued approximately after three months, while in provincial courts they can be issued within a few days. The expenses for the issuance of an order for payment are approximately up to a percentage of 8‰ of the amount of the claim, plus the remuneration of the lawyer, which, in this case and in all cases in general, depends on whether the lawyer is remunerated with a fixed periodic remuneration or as simply cooperating with the company. In this last case the respective remuneration constitutes an object of an agreement. The order for payment, in order to have a force of a *res judicata*, must be served twice, according to the detailed provisions of articles 630A and 633 of the Greek Code of Civil Procedure. The cost of each service of the order for payment to the debtor is, at a percentage of 80% approximately, up to €35, plus VAT, plus €35 for the submission of a copy of it to the competent court, concerning the first service.

Moreover, if the existing securities on a claim are not sufficient, the creditors, immediately after the issuance of the order for payment (and in most cases before the latter is served), enter, according to Article 724 of the Greek Code of Civil Procedure, mortgage notifications on real estate property of the debtor and the guarantors, with the condition that they find a security value in it. The legislative framework in force further provides for the possibility of the imposition of a conservative seizure in the hands of the debtor or of a third person. Suspension of the enforceability of the order for payment does not prevent, by an express provision of the law, such precautionary measures. The cost for the

entry of a conservative seizure, as well as for the entry of a mortgage prenotation amount, including VAT, is about 10‰ of the amount for which they are entered, including certificates, copies, etc. To this cost has to be added a small additional percentage for the remuneration of lawyers and for subsequent registrations of the entered seizures and prenotations to the offices under cadastre (where, of course, such registration is required).

The amendments of the Greek Code of Civil Procedure aimed at speeding up the proceedings of the forced execution, so that the latter is completed in a relatively reasonable time frame, in comparison to the lengthy and costly proceedings of the previous law. Additionally, with the amendments of the Code of Civil Procedure regarding creditors' classification, the aim of the legislation was the even partial satisfaction of all the creditors of the debtor. Thus, unprivileged claims (namely those not being secured with a pledge, mortgage or mortgage prenotation) are now classified as up to 10% of the amount of the auction product to be distributed to the creditors. Claims with a general privilege, when flowing together with claims being secured with a special privilege (pledge, mortgage or mortgage prenotation) are classified at 1/3 of the auction product, while the claims of the special privileged creditors are classified at 2/3 of it. However, if the claims of the special privileged creditors flow together with the claims of unsecured creditors and the claims secured with a general privilege, the first of the above claims (namely those secured with a special privilege) are classified as up to 65% of the auction product, the claims of unsecured creditors as up to 10% of the auction product and those with a general privilege as up to 25% of it. In order to avoid a case-by-case legal analysis, which goes beyond the scope of the present article, we are going to briefly mention the provisions of the Greek Code of Civil Procedure in force –after Law no. 4335/2015– concerning the enforcement of pecuniary claims.

In particular, after the service of the order for payment with an order for enforcement and with the condition that three days from this service have passed (article 926 par. 1 CCP), the main stages of the enforcement take place for the pecuniary satisfaction of the creditor, namely the seizure and the auction of movable and real estate property. Criterion for the application of either the previous law or the law in force after Law no. 4335/2015 is the time of the service of the order for enforcement. If the latter took place after January 1, 2016, the new Code of Civil Procedure is implemented, otherwise the previous law applies. The date of the forced auction is set not earlier than seven months from the date of the completion of the seizure and not

later than eight months from it (article 954§2 e CCP). If, for any reason, the auction does not take place on the date set and in case that another creditor submits a declaration of continuation of the proceedings, then a new auction is set two months from the date of the declaration, but not after three months from it (article 973§1 CCP). It is noted that according to the provisions in force, the parallel procedure of many forced executions is possible, after the imposition of a seizure by more than one creditor, so that the completion of the first auction with the selling of movable or real estate property can take place.

### *The collecting receivables expenses*

If other judicial actions do not take place, the expenses are about 10‰ of the amount of the claim for the forced seizure of real estate property and 1.5% for the auction. In these expenses, the remuneration of the bailiff for the service of the seizure report is included, as well as the remuneration for the drafting and publication of a summary of the seizure report, the registration of the seizure in the competent cadastral office, the expenditures for the valuer, for the announcement of the claim and for its service, the remuneration of the notary, etc. The expenses of the enforcement, if the auction product is sufficient, are removed and given to the person who expedites the enforcement before its distribution with the drafting of the creditors' classification board. It is noted, though, that after the entry into force of the provision of many seizures, the search for enforcement costs, which the creditor has paid but the enforcement has not taken place, is not allowed (article 997 par. 3 CCP). With respect to the seizure of movable property, the costs are significantly reduced, as the registration in a cadastral office (about 8‰ plus VAT) and expenses for a valuer (about €600) are not required. However, the exact determination of the expenses and the time required for the forced collection of a claim is extremely difficult, due to many factors, such as the amount of the claim, the stage on which the claim was transferred to the acquisition company (if, for example, an order for payment has been issued or not, prior to the transfer of the claim), if the previous law or the law in force is the applicable one, the number of judicial proceedings already opened or to be opened in the debtor's defense against the order for payment and the proceedings of enforcement, the bankruptcy of the debtor, the death of a person, the dissolution of a company and its position in liquidation, etc. It is thus clear that, despite the considerably limited –in comparison to the past– time frame for the collection of claims arising from non-performing loans and the

reduction of the expenses due to the reduction of the judicial actions (for example, for the suspension of the enforcement in the first stage), the forced collection of claims is lagging in terms of time and cost with respect to the finding of an arrangement solution and mainly of a final settlement solution within the context of the Code of Conduct of Law no. 4224/2013 or in general in the context of an extrajudicial settlement. Such delay, as will be demonstrated below, may have negative impacts, regarding the final decision of companies acquiring liquid assets, on whether to invest in the systemic banks' NPLs.

### 3. The Basel II<sup>1</sup> & III regulatory framework on loans' collaterals

The collaterals which cover the credit expansion granted by banks to their customers are hedging techniques that reduce or transfer the credit risk. At the same time, they can create other risks, e.g., legal, operational, market or liquidity risk, etc. For this reason it is necessary for the banks to use unambiguous procedures and control methods of these types of risk. It should be noted here that any reduction of risk and mainly the credit risk confronted by banks, which grant loans to their customers, makes them safer. This consequently reduces the need for extra supervisory capital. The regulatory framework of Basel II & III imposes institutional, legal and general criteria, in order to oblige banks to reduce the credit risk with the use of the hedging techniques mentioned above (see, for example, the *Standardized* method and the *Internal Rating Based* method). In addition, the documents that are used (e.g., for contracts, concessions, etc.) should be fully binding for all parties and also legally robust. For this purpose, legal revisions should be also carried out regularly, on behalf of banks, to ensure the solvency of those documents. Additionally, the legal framework must guarantee, to the examined bank, that the financial collateral which is assigned or transferred, can be further sold off; if it is kept in the safekeeping of someone else, it must be ensured that this is separate from the other assets of the custodian. Finally, the value of the asset used as collateral against the issued loan is assumed to not be positively correlated with the credit quality of the counterparty.

Banks can proceed to the calculation of their credit risk, for loans they have granted, provided that attached financial collaterals are recognized by the Basel II and III

mandates. Then, as a second step, they can proceed to the calculation of capital requirements, which will reduce their exposure against their counterparties.

The recognized financial guarantees, which can be used as collateral for the mitigation of the credit risk of the banks, officially are considered the following:

- Cash on deposit in a bank recorded as debt,
- Gold,
- Highly ranked debt titles recognized by an independent rating institute,
- Debt securities not recognized by an independent institute but only by the publishers (e.g., banks),
- Stocks (or bonds convertible into shares) included on a major stock index,
- Stocks (or bonds convertible into shares) which are not included on a major stock index but are traded in a recognized stock exchange,
- Shares/securities of collective investments Institute which invest in traded liquid values, similar to those mentioned above, which are recorded daily.

Then the banks can follow one of the two different methods for calculating the net and the weighted (after deduction of pre-appraised value of the collaterals) credit exposure, in order to disclose the anticipated bank's loss and the corresponding capital requirements. They can use either the *Standardized* or the *IRB-Internal Ratings Based* method.

#### *The Standardized method*

This method is separated into two different sub-methods: The *Simple* and the *Comprehensive* method (see BCBS, 2006).

In the *Simple* method, the computational approach of the attached weight of every issued loan for calculating the expected losses, and thus the capital requirements, is exogenous (according to the predetermined Tables provided by the Basel II & III). Additionally, the existence and type of financial guarantees (collaterals), which are attached to mitigate the banking assets, are important. Afterwards we have the replacement of the weighted credit factor of the counterparty with the weighted factor of the guarantee (collateral), for the portion of the loan which is covered by this. For example, for either a bank or corporate risk covered by some non-recognized financial guarantee to

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1. The reference to the Basel II regulatory framework is because some mandates did not change in Basel III.

be realized, a loss of 45% (of the total amount of loan exposure) would be accepted. On the other hand, for a country or bank risk, the identifiable loss would reach 75% of the specific loan exposure.<sup>2</sup> The weighted factor cannot be less than 20% (with a few exceptions), while the portion of the loan which is not guaranteed (hedged), will take the weighted value of the counterparty. So, for example, in cases where the counterpart is either a State, a central bank, a public company, a commercial bank, a financial firm, an insurance company, a mutual fund, etc., the weighting factor will be 0%.<sup>3</sup> If, however, the counterpart is none of the above, then the smallest weighted factor applied would be 10% (see BCBS, 2006).

In the case of the *Comprehensive* method, the bank needs to calculate the adjusted exposure of the credit risk of the counterparty. Actually, this method uses specific coefficients of variation (haircuts)<sup>4</sup> in order to adjust both the loan and the corresponding collateral. This way we can incorporate, in the loan exposure of the bank, any possible future variations of the collaterals due to the changes of the market values.<sup>5</sup>

### The IRB-Internal Ratings Based method (IRB)

In this method, the bank's loans portfolio can be initially classified into five (5) different categories, following different credit risk characteristics: for example, business claims, claims against States, claims

against other banking institutions, claims against other retail banking requirements and, finally, claims against financial assets. Consequently, a specific value is assigned to the specific loan, creating thus the weighted asset (Weighed Risk Asset, RWA) which corresponds to the specific credit risk (e.g. loan) of the examined portfolio.

More analytically, this specific method can be divided into two (2) sub-approaches: The *Fundamental* and the *Advanced*.

These two separate approaches differ fundamentally in the way they calculate the weighted requirement (RWA) which corresponds to each banking claim (asset) and, consequently, to the analogous capital requirement.<sup>6</sup> More specifically, if you follow the *Fundamental* approach, the bank is allowed to use its own estimates for calculating the probability of default (*Probability of default-PD*) of its counterparty, but, additionally, is obligated to follow guidelines from external mechanisms, e.g., the monetary authorities, for the assessment of the other parameters (i.e., the parameters *EAD* and *LGD*)<sup>7</sup> which contribute to the determination of credit risk.

On the other hand, in the case of the *Advanced* approach, the bank can use its own estimates of all these parameters (i.e. parameters: *PD*, *EAD* and *LGD*)<sup>8</sup> that help in the formation of the weighted credit risk in order to calculate the corresponding capital charge/losses.

2. As it is reported in Panagopoulos & Vlamis (2009), in the case of mortgage NPLs, the weighted rating of the collateral would be 100%.

3. There is of course a wider range of weighted factors, concerning the counterparties of the bank's assets, which are analytically described in regulation 575/2013 of the European Parliament.

4. The coefficient of variation (*H*) is a factor which is adjusted to the collaterals of each loan based on the variability of its price (see Panagopoulos & Peletidis, 2007, p. 127).

5. A simple algebraic presentation of the bank loan exposure would be of the following form (see, BCBS [2006]):

$$E_i^f = \max \left\{ 0, \left[ E_i \times (1 + H_i^e) - Co \times (1 - H_i^{Co}) \right] \right\} \quad (I)$$

where:  $E_i^f$  is the bank exposure from a specific loan,  $E_i$  is the exposure of an asset (loan) before its mitigation by the collateral,  $Co$  is the amount of the financial guarantee for compensation,  $H^e$  is the variation coefficient (% Haircut) of the specific bank's loan (if it exists) and finally,  $H^{Co}$  is the variation coefficient (% Haircut) of the specific financial collateral for hedging purposes.

The  $E_i^f$  calculation allows us, subsequently, to find the expected losses of the bank, based on the following algebraic formula:

$$E_i^f(\text{amount}) \times RWA_i(\%) = RWA(\text{amount}) \quad (II)$$

This way we can calculate the bank's capital requirements for the specific loan exposure.

6. With this term we mean the algebraic calculation of capital requirements for the specific loan exposure of a bank. More analytically, we refer to the relationship:  $RWA(\text{weighted loan amount}) \times 8\% = \text{Expected Loss}(\text{amount})$ , in order to calculate the required capital needs for this specific bank's loan exposure.

7. More specifically, the expected loss in case of default on behalf of the counterparty (*Loss Given default-LGD*) and the exposure of the bank's asset in the case of a defaulting counterparty (*Exposure at default-EAD*).

8. The methods for estimating these parameters can be either econometric (e.g. either Logit/Probit approach) or some Value at Risk (VaR) approach.

In the section that follows, after the presentation of the Greek legal framework that incorporates the rules for the collecting claims on NPLs and the analysis of the regulatory framework of Basel II & III for the calculation of the capital needs of banks in case of expected loss, we proceed to the valuation of an NPL (typical) portfolio before its reselling to an investing company.

#### 4. A model of the NPL portfolio's valuation

The decision of investing companies to purchase any NPLs from the systemic banks will basically depend on the IRR of this investment. For such calculation we seek out the discount rate which makes the sum of the cash outflows, which were spent in the acquisition

of this portfolio of problematic loans and, subsequently, the expected net free cash flow generated by the investment, equal to zero. The “green light” for such an investment decision is usually given after comparing the realized IRR with the investors’ expected yield. If the resulting IRR exceeds the investors’ expected yield, then the investment can be considered as potentially profitable.

The parameters which play an important role in this type of investment and to a large extent determine the amount that will be offered by such investing companies for the acquisition of a NPL portfolio are analytically presented in the first column of Table 1a.<sup>9</sup> In the second column of this Table, some plausible values/percentages, based on the Greek reality, are set to these variables.<sup>10</sup>

**TABLE 1a The basic factors for the calculation of the IRR of an entity that invests in the NPL bank portfolio**

**The assumptions of the model**

1. The degree of recoverability of the NPLs <sup>11</sup>	40%
2. NPL portfolio purchasing value (as a % of the nominal one) <sup>12</sup>	7%
3. Operating expenses (as a % of the entity’s annual receipts)	30%
4. The duration of the NPLs portfolio receipts	120
5. Interest rate of loans*	8%
6.a The market portfolio return**	15%
6.b The expected return of the distressed fund’s shareholder	2-3 times of the market portfolio return
6.c The required return of the NPL portfolio (2.5 × 15%)	37.0%

\* It is estimated that approximately 50% of the amounts received would come from the interest-bearing settled loans. The remaining 50% of the revenues would come from asset disposals.

\*\* We use the Equity Risk Premium calculated by Damodaran (2018) for Greece.

9. For an analytical presentation of each parameter of Table 1a, see Mouzoulas et al. (2017).

10. In our previous article (Mouzoulas et al., 2017, Vol. 32, *Greek Economic Outlook*), we extensively discussed the variability of those parameters that, according to our opinion, affect the expected yield (IRR) of an NPL portfolio investment.

11. No previous experience, on the recoverability of an NPL portfolio, in the Greek banking system exists. The 40% recoverability, of Table 1, was also implemented in our previous article of the *Greek Economic Outlook* (see Vol. 32, Table 1). This recoverability can of course be changed upward or downward (as a percentage), within the framework of an educational example, although this is not an issue of this article.

12. The specific percentage of the discount rate, concerning the NPL portfolio, is an average indicative percentage with and without collaterals (e.g. a mixed NPL portfolio). This percentage is decided after taking into consideration some specific variations of parameters which hypothetically affect the decision of an acquiring company to purchase the NPL portfolio. In a very recent buy-out of an NPL portfolio with collateral property (Piraeus Bank, 30/5/2018), the discount rate reached about 20.0%. In another recent case without collateral (Alpha Bank, 13/3/2018), the discount rate of the nominal value of the NPL portfolio was much lower (2.40%). Finally, it is necessary to mention here that the average discount rate of Table 1 was also used in our previous article (see *Greek Economic Outlook*, vol. 32, Table 1).

**TABLE 1b The IRR calculation of an entity that invests in bank NPLs****The IRR calculation**

Year	0	1	2	3	4	5	6	7	8	9	10
Annual revenues from interests and capital		29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12
Annual revenues from selling real assets		24.00	34.00	40.00	30.00	22.00	20.00	14.00	10.00	6.00	0.00
Total revenues		53.12	63.12	69.12	59.12	51.12	49.12	43.12	39.12	35.12	29.12
Operating expenses		15.94	18.94	20.74	17.74	15.34	14.74	12.94	11.74	10.54	8.74
Tax rate (29%)		10.78	12.81	14.03	12.00	10.38	9.97	8.75	7.94	7.13	5.91
Free cash flow (estimation)		26.40	31.37	34.35	29.38	25.41	24.41	21.43	19.44	17.45	14.47
Year 0: the NPLs redemption value (% × nominal value of the NPLs portfolio)											
Years 1-10: cash flows	-70	26.40	31.37	34.35	29.38	25.41	24.41	21.43	19.44	17.45	14.47
		<b>IRR 38.43%</b>									

In Table 1b, the numerical calculation of the IRR, on the basis of the assumptions in Table 1a, is presented. Additionally, taking into consideration the realities of the Greek tax system, we set a tax corporate rate on revenues (net of operating expenses) equal to 29%.

Based on the initial assumptions, the numerical result concerning the IRR of an NPL portfolio is about 38.4%. In addition, for a better understanding of the other parameters in Table 1b, we provide the following explanations:

- The price of this NPL portfolio buyout is only a percentage of its initial nominal value. Assuming that this nominal value is €1 billion, the acquiring value of €70 million makes the discount rate equal to 7%. This amount of money would be spent at year 0, and for the subsequent years (1-10), it is assumed that the investing company would generate some positive free cash flows, as described in the last row of Table 1b,
- The annual revenues, from the principal and the interest rates, are the sum of installments of the 50% of the amounts recovered, as initially described in the postscript of Table 1a. The cash inflows from these regulated loans would correspond to an average interest rate of 8%,
- The remaining 50% of annual revenues from NPLs will come from disposals of (real) assets. In addition, we follow the assumption that the amount of recoveries would come out by implementing methods of compelled collective receivables which

would be produced in the early years of the investment in NPLs and would decline progressively,

- The operating expenses are considered to be 30% of the annual revenues. This hypothesis was highlighted in the assumptions of Table 1a,
- The free cash flow results after the deduction of operating expenses and the income taxes from the total revenues,

Under the aforementioned assumptions, it is estimated that the IRR of our example would be around 38.43%. This result is fundamentally the percentage that makes the net present value of the cash flows, of the last row of Table 1b, equal to zero.

Based on the regulatory framework discussed in Section 2, special attention is next attributed to the legal procedures of the compelled collective receivables and to the (time) efficiency of this mechanism. Two (2) parameters/variables, which were analytically presented in Table 1a, are expected to be seriously affected from this: the degree of revocability of the NPL portfolio and the operating expenses. Any variation of these two parameters, as we will demonstrate below, is expected to affect the percentage of the IRR of the NPL portfolio.

However, for a better understanding of the IRR behavior of the NPL portfolio, we will initially implement a mathematical model of net present values as indicated in the next section.



### The model of time and cash collecting flows

The implemented mathematical model is in accordance with the assumptions of Table 1a for the computation of the IRR of an NPL portfolio. In brief, the calculation of the net present values (NPV) of such an investment will have the following algebraic form:

$$NPV = -IINV + \frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \dots + \frac{C_n}{(1+r)^n} \quad (1)$$

where:

$NPV$  is the net present value of the investment,

$IINV$  is the initial cash investment outflow,

$C_i$  is the expected cash inflow of the year  $i$  (with values from 1 to  $n$ ),

$n$  is the duration of the investment in years,

$r$  is the discount rate.

For reasons of simplifying the mathematical calculations, we assume that an investment is composed of an initial cash outflow that only renders once at the end of the time duration, which is the year  $t$ . In this case, the equation (1) is simplified to the following form:

$$NPV = -IINV + \frac{C_t}{(1+r)^t} \quad (2)$$

Because the IRR is the discount rate which makes the (aforementioned) net present value equal to zero, equation (2) can subsequently be transformed as:

$$0 = -IINV + \frac{C_t}{(1+IRR)^t} \quad (3)$$

Then equation (3), with the appropriate mathematical transformations, can next take the following algebraic form:

$$IRR = \left[ \frac{C_t}{IINV} \right]^{\frac{1}{t}} - 1 \quad (4)$$

The aforementioned equation (4) implies that the realized IRR of a hypothetical NPL portfolio clearly depends on the initial amount of the cash investment outflow ( $IINV$ ). Thus, the larger (smaller) the initial investing amount is, the smaller (larger) the IRR will turn out to be. It also depends on two additional factors:

- The size of the single cash inflow ( $C_t$ ) that will happen in year  $t$ . According to our initial assumptions, the two parameters –the cash inflow and the expected yield– are expected to move accordingly, i.e. the larger (smaller) the amount of the initial cash inflow the larger (smaller) the corresponding IRR. Overall, whatever positively or negatively affects the cash inflows of an investment also affects the derived IRR and, therefore, makes it more or less efficient,
- The time ( $t$ ). The IRR is inversely related to the time ( $t$ ) receiving the unique (in this example) cash inflow of ( $C_t$ ). In general, what emerges from the simplistic example of equation (4), is that the more we (time) extend the cash inflows of an investment, the more its IRR diminishes and, conversely, the faster these cash inflows “render” the higher the expected yield (IRR).

The extension of the aforementioned model in many time periods, in order to highlight the impact of the IRR determinants/factors, requires more complex calculations. This, however, goes beyond the main purpose of our article, although we believe that the results will be rather similar. The implementation of the above simplified mathematical model helps to effectively draw some interesting conclusions, which is our main objective here.

Following now a *Sensitivity analysis*, based on the initial numerical results derived from the simplified mathematical cash flow model (see Table 1b), we can next demonstrate how the Greek legal framework of the collective claim receivables upon problematic loans can influence both the direct and/or the indirect costs<sup>13</sup> of an NPL portfolio investment.

### Sensitivity analysis of the model

Initially, we begin from the direct costs. These (costs) are classified in the general category of the operating expenses. Thus, the higher they are, the smaller the remaining net cash inflows. As explained in the initial description of the simplified mathematical model, the IRR changes in the same direction with the inflows. Thus, the smaller they are (e.g. higher direct costs, smaller realized inflows), the lower the expected yield of the NPL portfolio will be. In Table 2 we present the change of the IRR relative to the operating costs as a percentage of the gross annual revenues.

13. More specifically, either through the impact on operating costs (direct costs) or through the impact on the time deferred revenues from disposals of assets.

**TABLE 2 The impact of the variability of operating expenses for the IRR of the NPL portfolio<sup>14</sup>**

Operating costs (as % of the annual revenues)	Internal rate of return (IRR, %)
25%	41.71%
26%	41.06%
27%	40.40%
28%	39.75%
29%	39.09%
30%	38.43%
31%	37.77%
32%	37.10%
33%	36.44%
34%	35.77%
35%	35.10%
36%	34.42%
37%	33.75%

From the results of Table 2 we can easily see that any increase (%) of the operating expenses (of Table 1b), will lead to the reduction of the expected yield (IRR) of the NPL portfolio.

Before we proceed to the discussion regarding the time-deferred revenues from assets disposals, we should discuss the significance of the way the time factor (t) affects the expected yield (IRR) of an NPL portfolio. For this purpose Table 1b should become more analytical, and then we can proceed to the presentation of Table 3. Thus, Table 2 is derived from the assumptions provided in Table 1a with some additional explanations presented below:

a) Gross revenues from assets disposals: The amount of money for all examined years is actually equal to 50% of the amount that is expected to be recovered (initially assumed as 40% of the nominal value of the NPL portfolio). These amounts of revenues are calculated accepting the basic assumption that “in due time” the earning from the disposals of assets would turn out diminishing.

- b) The annual net revenues from asset disposals result from the gross revenues of those disposals after the reduction of the relevant operating expenses (as a ratio of the gross revenues of the assets disposals over the total revenues). The same applies for the net revenues from the problematic loans arrangements, which are expected to remain constant during the examined years.
- c) The time of revenues’ collection from assets disposals is important. More analytically, they are under some kind of time deferment in order to reveal how the time extension of these particular revenues affects the investment’s expected yield (IRR). The degree of time differentiation, in our example, is measured as a percentage of the year’s duration, e.g., a 70% time differentiation of receiving these revenues signifies that they will be at 256 days of delay rather than originally assumed (i.e. algebraically:  $70\% \times 365$  days of the year). The discounted revenues from asset disposals also embody the degree of their time differentiation. Note that the time of the investment remains unchanged in 10 years.
- d) The discounted revenues from problematic loans arrangements are assumed to be collected on regular time intervals, of the investment period, without any kind of time rescheduling.

In Table 4, several time-deferred rates of revenues described in Table 3 are tested, in order to examine the degree/speed which the expected yield (IRR) of the NPL portfolio is reduced.

Finally, we should recall here that in our example we assume that half of the total revenues of this NPL investment would come from the disposals of the collaterals. If the revenues of this category are the largest percentage of total revenues (e.g. over 50% than initially assumed), then its contribution to the IRR synthesis will obviously be greater than expected. This, however, implies that we would have a (potentially) non-efficient performance of the NPL investment. Alternatively speaking, the more time-consuming this process of collecting revenues from compelling claim receivables is, on behalf of the investment companies, the bigger the discount of the NPL portfolio will be, with respect its nominal value, making the selling from the corresponding bank relatively low-priced (cheap).

14. The results of Table 2 were obtained by the application of the *sensitivity analysis* on the results of Table 1b. More analytically, it is the application of a TABLE “function”; in an *Excel* form, where the operating costs over revenues is used as an independent variable and the internal rate of return (IRR) as a dependent one.

**TABLE 3 Analytical revenues, by category, from investing in an NPL portfolio\***

Years	0	1	2	3	4	5	6	7	8	9	10	
Gross revenues from assets disposals		24	34	40	30	22	20	14	10	6	0	
Percentage (%) of revenues from assets disposals on gross revenues		45%	54%	58%	51%	43%	41%	32%	26%	17%	0%	
Annual net revenues from assets disposals		11.93	16.90	19.88	14.91	10.93	9.94	6.96	4.97	2.98	0.00	
Annual net revenues from rearrangements		14.47	14.47	14.47	14.47	14.47	14.47	14.47	14.47	14.47	14.47	
Recovery time for revenues from assets disposals (including time-deferred ones)		1.7	2.7	3.7	4.7	5.7	6.7	7.7	8.7	9.7	10.0	
Percentage (%) of time-deferred revenues from assets disposals		70%										
Discounted revenues from assets disposals		7.23	7.63	6.68	3.73	2.04	1.38	0.72	0.38	0.17	0.00	
Discounted revenues from loans re-arrangements		10.78	8.03	5.98	4.45	3.32	2.47	1.84	1.37	1.02	0.76	
Net discounted total cash flow revenues. Years, 0-10		-70	18.01	15.66	12.67	8.19	5.36	3.85	2.56	1.75	1.19	0.76

\* In this Table we calculate and present the cash flows from the different categories of revenues.

**TABLE 4 The effects of time-deferred rates of revenues from loan rearrangements\* on the IRR performance of an indicative NPL portfolio<sup>15</sup>**

Degree of time-deferred revenues from assets disposals	Internal rate of return (IRR,%)
5%	38.07%
10%	37.72%
15%	37.39%
20%	37.06%
30%	36.44%
40%	35.85%
50%	35.29%
60%	34.76%
70%	34.25%
80%	33.77%
90%	33.32%
100%	32.88%

\* Due to the malfunctions of the legal mechanism related to the collecting receivables.

## 5. Conclusions

The purpose of this article is twofold: first, to briefly present the issues that arose from the Greek legal framework on the claims of collective receivables (from NPLs) and, second, to reveal the consequences emerging from this legal framework to the expected yield (IRR) of such problematic loan portfolios through the implementation of an algebraic example.

But as it is understood from the aforementioned illustrative example, any delay of assets disposals, which essentially manifests itself in the form of deferred revenues, affects incrementally the anticipated IRR of an investment in NPLs. However, this could have a negative impact on the discount value (rate) of the NPL portfolio. Additionally, we should underline that although the anticipated IRR, for a problematic loan portfolio (NPL) we examined here, is regarded as rather high, we should not ignore the fact that NPLs comprise 45% of the Greek banking system's total loan portfolio. This percentage of NPLs is considered as "very high", especially if it is compared with the average Eurozone level which does not exceed 6-7% (see KPMG, 2017).

15. The Table 4 results are derived from the discounted free cash flow from an NPL portfolio investment using various time deferred revenues of assets disposals (see Table 3). Then, for every such group of cash flows we calculate the IRR, provided that their net present value will be equal to zero, if it were reimbursed with a (interest) rate that would equal to that return.

All these issues should consequently be taken into serious consideration by everyone who is involved with the sales of problematic loans. Finally, although there are social and political issues associated in principal with real estate auctions, at the same time we should not ignore that any more delay in resealing those problematic loans may lead to further negative effects on their discount value (rate), which potentially can lead to a re-capitalization of the systemic banks' equity.

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