BANKA QENDRORE E REPUBLIKËS SË KOSOVËS
CENTRALNA BANKA REPUBLIKE KOSOVO
CENTRAL BANK OF THE REPUBLIC OF KOSOVO

Pursuant to Article 35, paragraph 1, subparagraph 1.1, of the Law No. 03/L-209 on Central Bank of the Republic of Kosovo (Official Gazette of the Republic of Kosovo No.77 / 16 August 2012), Article 92, paragraph 3, and Article 114 of the Law No. 04/L-093 on Banks, Microfinance Institutions and Non-Bank Financial Institutions (Official Gazette of the Republic of Kosovo No.11 / 11 May 2012), the Board of the Central Bank, at the meeting held on 31 January 2019, approved the following:

REGULATION
ON EFFECTIVE INTREREST RATE AND DISCLOSURE REQUIREMENTS FOR NON BANK FINANCIAL INSTITUTIONS

Article 1
Purpose and Scope

1. The purpose of this Regulation is to determine the unified methodology for calculation and disclosure of the effective interest rate on credit granted and the minimum disclosure requirements in order to provide the customers with full and accurate information on products and services of the non-bank financial institutions (hereinafter: NBFI).

2. A unified methodology of calculation and disclosure of effective interest rates and disclosure of other information on products and services, aims to enable customers an easy and fair comparison among financial institutions regarding the costs and benefits of their products and the actual cost of loans, thus increasing the transparency in the market.

3. CBK requires that the fees for the products and the financial services of the NBFIs should bear a direct relationship to the cost of providing those products and services, therefore the NBFIs may be asked by the CBK to justify the fees they impose. CBK expects that the NBFIs will, in pricing their products and services, be sensitive to the desirability of making the fees as fair and as affordable as possible.

4. This Regulation applies to all NBFIs registered by the CBK to operate in the Republic of Kosovo.

Article 2
Definitions

1. All the terms, used in this Regulation, shall have the same meaning as the following definitions for the purpose of this Regulation**:**

1.1. "Credit" shall imply any loan or direct legal commitment to disburse money in exchange for a right to repayment of the amount disbursed and outstanding and to the payment of interest or other charges on such amount;

1.2. "Interest rate" shall imply the interest rate expressed as a fixed or variable percentage applied annually to the amount of credit approved;

1.3. "Effective Interest Rate (hereinafter: EIR)"- shall imply the total cost of credit, stated as an annual rate of credit's total value and calculated according to the methodology presented in Article 4 and Annex 1 of this Regulation, by means of which discounted cash inflows are balanced against discounted cash outflows and which refers to the credits granted by the NBFIs. In discounting, the actual number of (calendar) days in a month and a 365/366-day year are used.

1.4. "Total cost of credit to the customer" shall imply all the costs, including interest, commissions, taxes and any other kind of expenses that the customer is required to pay for the NBFI, in connection with the credit agreement/contract; other compulsory expenses related to the credit agreement. Insurance premiums should also be included in the total cost of credit if a contract of such a service is compulsory in order to obtain the credit or to obtain it according to the terms and conditions marketed and if such a service is paid by the NBFI and charged to the customer or if it is not possible for the customer to choose the provider of that specific required service;

1.5. "Advertisement" shall imply every form of advertising, whether in a publication, by television or radio, by display of notices, signs, labels, brochures, circulars, catalogues, price lists, internet or other material, or in any other way.

Article 3
Disclosure Requirements

1. Data on credits advertised by the NBFIs, at their premises or in the media, which directly or indirectly represent interest rate or some other information considered as a part of a credit cost shall also contain the EIR.

2. An advertisement shall not be misleading or inaccurate and shall not misrepresent a credit contract. It shall not refer to a product or service as "free" or "no cost" (or contain a similar term) if any maintenance or activity fee may be imposed on the account.

3. EIR shall not be less conspicuous than other data and the NBFI, when disclosing it, shall use the term "Effective Interest Rate." If the term is repeated more than once, the abbreviation EIR may be used thereafter. EIR shall be reported by rounding it to at least one (1) decimal place.

4. Prior to the selection of a product or service, and before the conclusion of a contract, the NBFIs shall provide to their customers complete information about terms and conditions, deadlines, interest rate and EIR, and other fees that the customer is required to pay to the third parties in order to obtain the credit. The NBFIs shall also inform their customers prior to the conclusion of contracts, about customer's rights and responsibilities, including any possible future arising costs and penalties, as well as the accompanying risks in getting such a product or service. This information shall be available for the customer in writing and prior to signing the contract.

5. Before concluding the credit contract, the NBFIs shall inform their customers about his/her right to obtain the draft of the contract free of charge in order to enable him/her to review the contract before he/she signs it, and upon the customer's request, the NBFIs shall provide the customer with a draft of a contract for the product or service he/she is interested in.

6. The NBFIs shall not change the contents of any agreement/contract, for products or services, signed by their customers except those parts which are allowed to be changed with the legislation in force and by the agreement itself; however, that can be done only with the prior written notification of every individual customer that is subject to such a change. The notification shall be delivered at least one (1) month before the change becomes effective and it shall contain accurate and full information, expressed in an understandable way for the customer.

7. The NBFIs shall draft and approve the calculation methodology/policy used on setting their credit prices, which shall determine with their internal regulations the following:

7.1. Interest rate and the EIR applied on credits calculated in accordance with the requirements of this regulation;

7.2. Commissions, fees and other expenses charged for their products and services at the time of conclusion of contract, and possible future arising costs in case certain conditions are fulfilled.

Article 4
The Methodology for Calculation of EIR on Credits

1. The EIR shall be calculated as specified in the mathematical formula presented in the Annex I of this Regulation.

2. For the purpose of calculating the EIR, the total cost of credit to the consumer defined by paragraph 1.4 of Article 2 of this Regulation, shall not include the following:

2.1. Expenses that are unknown on the calculation date, but which may occur during the credit disbursement;

2.2. Expenses payable from the customer in case of not meeting any of the commitments provided for in the credit agreement;

2.3. Expenses that are different from the purchasing price, which the customer should pay for the purchasing of commodities and services, if the purchase is performed in cash or by Instalments, on condition that the NBFI will not be the last beneficiary of these payments;

2.4. Expenses of the customer to pay other parties (for example: a public notary, tax authority, mortgage register) while drafting the credit agreement and any other expenditure for the registration and warranty. However, these expenses shall be clearly disclosed in writing to the customer before the conclusion of contract.

2.5. Expenses for insurance premiums compulsory to obtain the credit or obtain it with the particular terms and condition offered, in cases where they are paid by the customer to the insurance company, that he has the option to choose himself. In these cases, these expenses shall be disclosed by the NBFIs in addition to the EIR, explaining that the insurance premium is compulsory but not included in the calculation of the EIR.

2.6. Expenses for insurances which are not compulsory to obtain the credit or obtain it on the terms and conditions offered;

2.7. Each expense that customers have to pay to the NBFI, only when:

2.7.1. The credit granted was not totally or partially used;

2.7.2. The customer applies for a change in the payments deadline and such an application is accepted by the NBFI.

3. Expenses for maintaining an account, necessary for carrying out payments or credit withdrawal, as well as other costs related to credit payment transactions, shall be included in the total credit cost to the customer, unless the opening of the account for these services is optional for the customer (which means that customers are not obliged to open an account with the bank for these services) and the costs of maintaining the account have been clearly and separately shown in the credit agreement or in any other agreement concluded with the costumer;

4. The EIR is calculated based on the assumption that the credit agreement is valid over the agreed period and parties meet their liabilities in accordance with specifications and the timeline agreed therein.

5. When the credit agreements contain provisions providing for changes to the interest rates, or other expenses included in the EIR, but immeasurable at the time this rate is calculated, the EIR shall be calculated upon the assumption that the interest rate and other expenses will remain

unchanged (fixed) from their initial level and will be applied until the completion of the obligations of the credit agreement.

6. The NBFI shall set out in the credit contract the way it will notify the customers each time the basic elements for the calculation of EIR are changed, before any such a change.

7. When concluding a credit contract, the NBFI shall present the repayment schedule (amortization plan), together with a clearly stated EIR, to the customer. In addition, the NBFIs shall attach a copy of a repayment schedule, signed by the customer, in the respective credit file.

8. Where necessary, the methods set out in Annex I of this Regulation, if applicable, may be used in calculating the EIR, as well as the examples provided with Annex II of this Regulation for further clarification.

9. The NBFIs shall submit to the Central Bank of the Republic of Kosovo, on a quarterly basis, the reports on the EIR on all products and services they offer to their customers. These reports have to be submitted within fifteen (15) days after the end of each quarter.

Article 5
Elements of Credit Agreement (Contract)

1. Each credit agreement (contract) shall be prepared in a written form, endorsed by the contracting parties, and shall disclose at least the following elements:

1.1. Type of credit (Instalment, margins, etc.);

1.2. Purpose of credit usage;

1.3. Identities and geographical addresses of the contracting parties;

1.4. The credit specifications concerning the amount, monetary currency, issuing date, maturity date, interest rate and its type (fixed or variable), directing index in case of variable rate (EURIBOR, LIBOR, etc.), EIR, the frequency of EIR change or its comprising parts, Instalments of the credit repayment and the settlement date or period;

1.5. Initial commission paid by the customer (if applicable) or different commissions when the credit is received or during repayments;

1.6. In the case of a credit in the form of a deferred payment for a specific good or service or in the case of linked credit agreements, the respective good or service and its cash price;

1.7. The total amount payable by the customer, calculated at the time the credit agreement is concluded;

1.8. Where applicable, the commission for maintaining one or several accounts for both payment transactions and drawdowns for the credit (unless the choice of account for the execution of such transactions is possible for the customer), as well as any fee deriving from the credit agreement and the conditions under which those fees are applicable;

1.9. The interest rate applicable in the case of delinquencies, as applicable at the time of the conclusion of the credit agreement and the manner of its calculation and, where applicable, any fees or penalties payable for default and the terms of their application;

1.10. A warning regarding the consequences of delinquencies;

1.11. Where applicable, a statement that notarial, registration, guarantee or any other required fees for third parties, must be paid to obtain the credit;

1.12. The type of collateral (if existent);

1.13. The parties liabilities and penalties, and conditions when they arise and apply;

1.14. The way the contract terms might be changed and the way the contract is terminated;

1.15. The number of endorsed original copies of the contract and the way they are possessed by the parties.

2. Upon granting the credit or upon its restructuring, the NBFI shall provide the customer with the following:

2.1. The credit amortization plan, at the moment of concluding the credit agreement and in cases of restructuring, which shall indicate the Instalments and their due periods and the table shall contain a breakdown of each repayment showing principal amortization, the interest calculated and, where applicable, any additional costs;

2.2. The schedule of all pre-defined and known payments, fixed or variable, which the customer shall pay during the process of receiving the credit and during the period of its duration. The NBFIs shall disclose here both the expenses that are included in the calculation of the EIR and those that are not included;

2.3. Possible future arising costs and penalties and conditions when they apply;

2.4. In cases of variable interest rates a written warning of the risk from the increase of interest rate during the credit duration as the result of increase of orientating index,

2.5. Prepayment penalty. If a penalty may be imposed for paying all or part of the principal before its due date, this prepayment penalty must be disclosed to the customer, including the method of its calculation.

Article 6
Other Disclosers

1. All NBFI's shall prepare a price list of all charges for all products and services they render, posting them in a conspicuous manner, and that list shall be made available to all inquiring customers.

2. NBFI's shall ensure that each of its branch offices and units dealing with retail customers shall have printed price lists which contain the required information ready to be delivered to an

inquiring customer. Such information should be clear and understandable as well as published in a NBFI's web page.
3. NBFI's shall ensure that the price lists are regularly updated and shall not impose charges on customers in excess of the disclosed structure or compute such charges in a manner inconsistent with the disclosed computing criteria.

Article 7
Enforcement, Remedial Measures and Civil Penalties

Violation of provisions of this Regulation shall be subject to the remedial measures and penalties provided for in the Law on Central Bank of Kosovo and the Law on Banks, MFI and NBFI.

Article 8
Abrogation

Upon the entry into force of this Regulation, it shall abrogate the provision of Article 18 paragraph 1 sub-paragraph 1.4 of the Regulation on Registering, Supervision and Operation of Non-Bank Financial Institutions.

Article 9
Annexes

Annexes to this Regulation are: Annex 1 and Annex 2.

Article 10
Entry into force

This Regulation shall enter into force 15 days following its approval.

Flamur Mrasori

Chairman of the CBK Board

Annex 1

The Methodology for Calculation of the EIR for Credits

The basic equation for calculating the effective interest rate (EIR) equates, on yearly basis, **on one hand** the total present value of drawdowns, by subtracting every withhold expenditure (for example administrative and/or management expenditures etc.) placed under the customer's disposal according to the loan agreement and **on the other hand** the total present value of repayments and payments of charges:

$$\sum_{k=1}^{m} C_k (1+X)^{-t_k} = \sum_{l=1}^{m'} D_l (1+X)^{-S_l}$$

Where:

- X is the EIR which may be calculated (basing on algebra or on a computer program) when the other terms in the equation are known.
- m is the total number of Instalment credit if the credit is disbursed by Instalments, paid from the NBFI.
- k is the proceeding number of Instalments credit, if the credit is disbursed by Instalments, paid from the NBFI, therefore $1 \leq k \leq m$,
- C_k is the loans total present value (cash flow) on the client's disposal during k period
- t_k is the interval stated in years and fractions of one year between the first cash flow put under the client's disposal (if the loan is flowed by Instalments) and the date of each ensuing Instalment credit put under the client's disposal, that is $t1 = 0$
- m' is the total number of Instalments(cash flows) paid by the client for the loan settlement and/or expenditures payment;
- l is the ensuing number of the Instalments paid by the client for the loan settlement (repayment or expenditure payment),
- D_l is the value of the Instalment (cash flow) or payment expenses paid by the client during period l.
- S_l the interval expressed in years and fractions of one year between the date of the first cash flow put at the client's disposal (in case the loan is flowed by Instalments) or the date of credit flow, if the credit flow is complete and the date of each Instalment for settlement and/or the ensuing expenses paid by the client.

I. Remarks:

1. The amounts paid by both parties at different times shall not necessarily be equal and shall not necessarily be paid at equal intervals.

2. The original date must be the date when the NBFI pays the first Instalment of credit flow if the loan is flowed by Instalments or the date when the loan is disbursed if the loan under the client's disposal is disbursed completely.

3. Intervals between dates used in the calculations shall be expressed in years or in fractions of a year. A year is presumed to have 365 days (or 366 days for leap years), 52 weeks or 12 equal months. An equal month is presumed to have 30.41666 days (i.e. 365/12) regardless of whether or not it is a leap year.

4. The result of the calculation shall be expressed with an accuracy of at least one decimal place. If the figure at the following decimal place is greater than or equal to 5, the figure at that particular decimal place shall be increased by one.

5. The equation can be rewritten using a single sum in case of complete use of the credit by NBFI (A_k), which will be positive or negative, in other words either paid or received during periods 1 to k, expressed in years, i.e.:

$$S = \sum_{k=1}^{n} A_k (1+X)^{-t_k},$$

S – is the present balance of flows by deducting any expenses/fees withheld, for example administrative expenses, management expenses, etc. If the aim is to maintain the equivalence of flows, the value will be zero.

NBFIs shall give assurance that the applicable solution methods will produce an outcome equal to the results of examples presented in the Annex II, below.

II. Additional assumptions for the calculation of the effective interest rate:

1. If a credit agreement gives the consumer freedom of drawdown, the total amount of credit shall be deemed to be drawn down immediately and in full;

2. If a credit agreement provides different ways of drawdown with different charges or borrowing rates, the total amount of credit shall be deemed to be drawn down at the highest charge and borrowing rate applied to the most common drawdown mechanism for this type of credit agreement;

3. If a credit agreement gives the consumer freedom of drawdown in general but imposes, amongst the different ways of drawdown, a limitation with regard to the amount and period of time, the amount of credit shall be deemed to be drawn down on the earliest date provided for in the agreement and in accordance with those drawdown limits;

4. If there is no fixed timetable for repayment, it shall be assumed:

a. that the credit is provided for a period od one year; and

b. that the credit will be repaid in 12 equal Instalments and at monthly intervals;

5. If there is a fixed timetable for repayment but the amount of such repayments is flexible, the amount of each repayment shall be deemed to be the lowest for which the agreement provides;

6. Unless otherwise specified, where the credit agreement provides for more than one repayment date, the credit is to be made available and the repayments made on the earliest date provided for in the agreement;

7. In the case of an overdraft facility the total amount of credit shall be deemed to be drawn down in full and for the whole duration of the credit agreement. If the duration of the credit agreement is not known the effective interest rate shall be calculated on the assumption that the duration of the credit is three months;

8. If different interest rates and charges are offered for a limited period or amount, the interest rate and the charges shall be deemed to be the highest rate for the whole duration of the credit agreement;

9. For consumer credit agreements for which a fixed borrowing rate is agreed in relation to the initial period, at the end of which a new borrowing rate is determined and subsequently periodically adjusted according to an agreed indicator, the calculation of the effective interest rate shall be based on the assumption that, at the end of the fixed borrowing rate period, the borrowing rate is the same as at the time of calculating the effective interest rate, based on the value of the agreed indicator at that time.

Annex 2

Examples of Calculation of the Effective Interest Rate on Credits

The aim of the examples of the calculation of the EIR is to illustrate the application of the calculation of the EIR as regards the formula presented in Annex 1, and the assumptions used for the calculation of different products and services. Using these examples helps NBFIs to reach identical results when implementing this Regulation.

The following examples are taken from the Study on the Calculation of the Annual Percentage Rate of Charge for Consumer Credit Agreements, the Final Report issued by the Directorate – General Health and Consumer Protection in 2009, which is available at the website: http://ec.europa.eu/consumers/rights/docs/study_APR_en.pdf, with some additional changes by the CBK, for their adoption with the requirements of this Regulation .

The Table 1 below shows some of the common features used in the following examples of different credit products.

Table 1

Feature	Instalment	Revolving credits
Amount	€ 6000 (exceptions 11, 14, 15)	€ 1000
Duration	2 years (exceptions 1, 2, 15, 17)	Endogenously determined by a minimum repayment of the 20% of the balance outstanding with a minimum of €20 (exceptions 18, 19 and 20)
Frequency of payments	Monthly (exceptions 1, 2, 14)	Monthly
Interest rate	9% yearly (exceptions 14, 15)	12% effective
Other charges and fees (when required)	Administrative costs € 60	Administrative costs of €25 if single sum payment or €2.5 per month
Insurance costs (when required)	5% of the initial amount of credit	1.5% of the balance outstanding

The Table 2 below shows the following set of examples of this annex, including a brief description of them and their most distinguishing features.

Table 2

Number	Description	Feature
Revolving credits		
1	Instalment credit with a single repayment	Duration and number of repayments/Instalments
2	Instalment credit with four annual Instalments	Duration and frequency of repayments
3	Instalment credit with monthly Instalments	Monthly Instalments
4	Instalment credit with the first repayment in a specific number of days	First repayment period with different length
5	Instalment credit with administrative costs	Administrative charges
6	Instalment credit with administrative charges distributed over the regular repayments	Regular administrative costs
7	Instalment credit with administrative costs	Regular insurance premiums

	and regular insurance premiums	
8	Instalment credit with administrative costs and single sum insurance premium	Single-sum insurance premium financed over the credit duration
9	Balloon type credit with administrative costs and regular insurance premiums	Balloon payment
10	Instalment credit with an advance payment and administrative costs	Advance payment
11	Leasing agreement	Advance payment plus final payment
12	Instalment credit with administrative costs and decreasing Instalments	Decreasing Instalments
13	Instalment credit with administrative costs and increasing Instalments	Increasing Instalments
14	Instalment credit with flexibility in the amount of the repayments	Flexibility in the amount of the repayments
15	Instalment credit with a few number of repayments and high charges	Few number of repayments and high charges
16	Instalment credit with increasing interest rate	Increasing interest rate
17	Credit agreement without a fixed timetable for repayment	No fixed timetable for repayment
Number	Description	Feature
Revolving credits		
18	Revolving credit with a pre-set duration and regular payment of the total cost of the credit (interest and charges)	Regular payment of the total cost of the credit

19	Overdraft facility with an unlimited period of validity and regular payment of the total cost of the credit	Overdraft facility with an unlimited period of validity and regular payment of the total cost of the credit
20	Open-end credit with administrative costs and regular repayment of a fixed amount	Open-end credit with set-up costs and regular repayment of a fixed amount
21	Open-end credit with administrative costs and regular payment of the total cost of the credit (interest) plus a minimum percentage of the balance outstanding	Open-end credit with set-up costs and regular payment of the total cost of the credit plus a minimum percentage of the balance outstanding
22	Open-end credit with administrative costs and regular payment of the total cost of the credit (interest and insurance premiums) plus a minimum percentage of the balance outstanding	Regular insurance premiums
23	Open-end credit with administrative costs and regular repayment of a minimum percentage of the balance outstanding (capital and interest)	Open-end credit with administrative costs and regular repayment of a minimum percentage of the balance outstanding (capital and interest)
24	Credit card with annual costs, increasing borrowing rate and regular repayment of a minimum percentage of the balance outstanding (capital and interest)	Annual maintenance costs and increasing interest rates

EXAMPLES:

The following examples illustrate the calculation of the EIR on different products offered by financial institutions and cover a wide range of elements and characteristics they are distinguished with. The examples should be interpreted as notional examples in the sense that the amounts, charges or interest rates assumed are only illustrative of the market products, which actually might combine the different elements shown in these examples:

EXAMPLE1

Credit agreement for a total amount of credit of €6000 repayable in a single Instalment of €6270 in six months.

The equation becomes:

$$6000 = 6270\frac{1}{(1+X)^{0.5}}$$

giving X=9.202500%, i.e.: an EIR of 9.2%.

EXAMPLE 2

Credit agreement for a total amount of credit of €6000 repayable in 4 equal annual Instalments of €1852.01.

The equation becomes:

$$6000 = 1852.01\frac{1}{(1+X)^{1}} + 1825.01\frac{1}{(1+X)^{2}} + 1825.01\frac{1}{(1+X)^{3}} + 1825.01\frac{1}{(1+X)^{4}}$$

or:

$$6000 = 1852.01\frac{1-\frac{1}{(1+X)^{4}}}{X}$$

giving X=8.999951%, i.e..: an EIR of 9.0%.

EXAMPLE 3

Credit agreement for a total amount of credit of €6000 repayable in 24 equal monthly Instalments of €274.11.

The equation becomes:

$$6000 = 274.11\frac{1}{(1+X)^{1/12}} + 274.11\frac{1}{(1+X)^{2/12}} + \cdots + 274.11\frac{1}{(1+X)^{24/12}}$$

or:

$$6000 = 274.11\frac{1-\frac{1}{(1+X)^{24/12}}}{(1+X)^{1/12}-1}$$

giving X= 9.381299%, i.e..: an EIR of 9.4%.

EXAMPLE 4

Credit agreement for a total amount of credit of €6000 repayable in 24 equal monthly Instalments, the first of which must be paid in a specific number of days from the conclusion of the agreement.

Let us first consider the case that the number of days to the first Instalment is 20 in a year with 365 days. If the interest rate is 9%, the monthly Instalment is €273.41, and the equation becomes:

$$6000 = 273.41\frac{1}{(1+X)^{20/365}} + 273.41\frac{1}{(1+X)^{20/365+1/12}} + \cdots + 273.41\frac{1}{(1+X)^{20/365+23/12}} = \\ = (1+X)^{1/12-20/365}\left[273.41\frac{1}{(1+X)^{1/12}} + 273.41\frac{1}{(1+X)^{2/12}} + \cdots \right. \\ \left. + 273.41\frac{1}{(1+X)^{24/12}}\right]$$

or:

$$6000 = 273.41\ x\ (1+X)^{1/12-20/365}\frac{1-\frac{1}{(1+X)^{24/12}}}{(1+X)^{1/12}-1}$$

giving X= 9.381531%, i.e..: an EIR of 9.4%.

If the period of 20 days belongs to a leap year, using the same borrowing rate of 9% the monthly Instalment remains the same as before to a precision of two decimals. The new equation becomes:

$$6000 = 273.41\frac{1}{(1+X)^{20/366}} + 273.41\frac{1}{(1+X)^{20/366+1/12}} + \cdots + 273.41\frac{1}{(1+X)^{20/366+23/12}} = \\ = (1+X)^{1/12-20/366}\left[273.41\frac{1}{(1+X)^{1/12}} + 273.41\frac{1}{(1+X)^{2/12}} + \cdots \right. \\ \left. + 273.41\frac{1}{(1+X)^{24/12}}\right]$$

or:

$$6000 = 273.41\ x\ (1+X)^{1/12-20/366}\frac{1-\frac{1}{(1+X)^{24/12}}}{(1+X)^{1/12}-1}$$

giving X= 9.383024%, i.e..: an EIR of 9.4%.

If the number of days to the first repayment is one month plus a period of 20 days in a year with 365 days. For the borrowing rate of 9%, the monthly Instalment is significantly higher, reflecting the longer duration of the credit, and amounts to €275.45. The equation becomes:

$$6000 = 275.45\frac{1}{(1+X)^{20/365}} + 275.45\frac{1}{(1+X)^{20/365+1/12}} + \cdots + 275.45\frac{1}{(1+X)^{20/365+24/12}} =$$
$$= (1+X)^{-20/365}\left[275.45\frac{1}{(1+X)^{1/12}} + 275.45\frac{1}{(1+X)^{2/12}} + \cdots + 275.45\frac{1}{(1+X)^{24/12}}\right]$$

or:

$$6000 = 275.45\ x\ (1+X)^{-20/365}\frac{1-\frac{1}{(1+X)^{24/12}}}{(1+X)^{1/12}-1}$$

giving X= 9.377528%, i.e..: an EIR of 9.4%.

Finally, if the number of days to the first repayment is one month plus a period of 20 days in leap year, the monthly Instalment remains the same as before to a precision of two decimals and the equation becomes:

$$6000 = 275.45\frac{1}{(1+X)^{20/366+1/12}} + 275.45\frac{1}{(1+X)^{20/366+2/12}} + \cdots + 275.45\frac{1}{(1+X)^{20/366+24/12}} =$$
$$= (1+X)^{-20/366}\left[275.45\frac{1}{(1+X)^{1/12}} + 275.45\frac{1}{(1+X)^{2/12}} + \cdots + 275.45\frac{1}{(1+X)^{24/12}}\right]$$

or:

$$6000 = 275.45\ x\ (1+X)^{-20/366}\frac{1-\frac{1}{(1+X)^{24/12}}}{(1+X)^{1/12}-1}$$

giving X= 9.378904%, i.e..: an EIR of 9.4%.

EXAMPLE 5

Credit agreement for a total amount of credit of €6000 repayable in 24 equal monthly Instalments of €274.11. Administrative charges of €60 payable on conclusion of the agreement.

The equation becomes:

$$6000 = 60 + 274.11\frac{1}{(1+X)^{1/12}} + 274.11\frac{1}{(1+X)^{2/12}} + \cdots + 274.11\frac{1}{(1+X)^{24/12}}$$

or:

$$6000 = 60 + 274.11\frac{1-\frac{1}{(1+X)^{24/12}}}{(1+X)^{1/12}-1}$$

giving X= 10.474957%, i.e..: an EIR of 10.5%.

Compared to example 3, the EIR increases as a result of the additional costs.

EXAMPLE 6

Credit agreement for a total amount of credit of €6000 repayable in 24 equal monthly Instalments of €274.11. Administrative charges of €60 spread over the repayments.

The monthly payment becomes:

$$A = 274.11 + \frac{60}{24} = € 276.61$$

and the equation becomes:

$$6000 = 276.61\frac{1}{(1+X)^{1/12}} + 276.61\frac{1}{(1+X)^{2/12}} + \cdots + 276.61\frac{1}{(1+X)^{24/12}}$$

or:

$$6000 = 276.61\frac{1-\frac{1}{(1+X)^{24/12}}}{(1+X)^{1/12}-1}$$

giving X= 10.368635%, i.e..: an EIR of 10.4%.

Compared to example 5, the EIR decreases as a result of the distribution of administrative costs over the repayments.

EXAMPLE 7

Credit agreement for a total amount of credit of €6000 repayable in 24 equal monthly Instalments of €274.11. Administrative charges of €60 payable on conclusion of the agreement plus insurance costs of 5% of the credit limit spread over the repayments.

The costs associated with insurance premiums must be included in the total cost of the credit if insurance is compulsory in order to obtain the credit or to obtain it on the terms and conditions marketed. It is assumed this is the case.

The monthly payment becomes:

$$A = 274.11 + \frac{5\% \; x \; 6000}{24} = € \; 286.61$$

and the equation becomes:

$$6000 = 60 + 286.61\frac{1}{(1+X)^{1/12}} + 286.61\frac{1}{(1+X)^{2/12}} + \cdots + 286.61\frac{1}{(1+X)^{24/12}}$$

or:

$$6000 = 60 + 286.61\frac{1 - \frac{1}{(1+X)^{24/12}}}{(1+X)^{1/12} - 1}$$

giving X= 15.506941%, i.e..: an EIR of 15.5%.

EXAMPLE 8

Credit agreement for a total amount of credit of €6000 repayable in 24 equal monthly Instalments. Administrative charges of €60 payable on conclusion of the agreement plus single-sum insurance costs of 5% of the credit limit payable in single sum on conclusion of the contract.

The costs associated with insurance premiums must be included in the total cost of the credit if insurance is compulsory in order to obtain the credit or to obtain it on the terms and conditions marketed and if this service is provided by financial institutions and charged on the client. It is assumed this is the case.

The amount financed is given by the sum of the amount of the credit and the percentage of insurance costs:

$$6000 + 5\% \, x \, 6000 = \, € \, 6300$$

and the monthly Instalment which provides full repayment of this amount is €287.81.

The equation becomes:

$$6000 = 60 + 287.81 \frac{1}{(1+X)^{1/12}} + 287.81 \frac{1}{(1+X)^{2/12}} + \cdots + 287.81 \frac{1}{(1+X)^{24/12}}$$

or:

$$6000 = 60 + 287.81 \frac{1 - \frac{1}{(1+X)^{24/12}}}{(1+X)^{1/12} - 1}$$

giving X= 15.993938%, i.e..: an EIR of 16.0%.

Compared to example 7, both the Instalments and the EIR are higher reflecting the costs of insurance financed on conclusion of agreement.

EXAMPLE 9

Balloon-type credit agreement for a total amount of credit of €6000 repayable in 23 equal monthly Instalments plus a final payment in month 24th representing 25% of the initial amount of the credit. Administrative charges of €60 payable on conclusion of the agreement plus insurance costs of 5% of the credit limit spread over the repayments.

The costs associated with insurance premiums must be included in the total cost of the credit if insurance is compulsory in order to obtain the credit or to obtain it on the terms and conditions marketed and if this service is provided by the financial institution and charged on the client. It is assumed this is the case.

With an interest rate of 9%, the monthly Instalment which provides full repayment of the credit is €225.44. The monthly payment for the first 23 months then becomes:

$$A_{1-23} = 225.44 + \frac{5\% \text{ x } 6000}{24} = € \, 237.94$$

and the payment in month 24 is:

$$A_{24}=25\% \text{ x } 6000+\frac{5\% \text{ x } 6000}{24}=€\ 1512.50$$

The equation becomes:

$$6000 = 60 + 237.94\frac{1}{(1+X)^{1/12}} + 237.94\frac{1}{(1+X)^{2/12}} + \cdots + 237.94\frac{1}{(1+X)^{23/12}} + 1512.50\frac{1}{(1+X)^{24/12}}$$

or:

$$6000 = 60 + 237.94\frac{1-\frac{1}{(1+X)^{23/12}}}{(1+X)^{1/12}-1} + 1512.50\frac{1}{(1+X)^{24/12}}$$

giving X= 14.610574%, i.e..: an EIR of 14.6%.

This example illustrates the case of credits which offer the postponement of the repayment of a large part of the credit to the end of the agreement. The higher credit risk due to the huge last payment can justify the requirement of insurance.

EXAMPLE 10

Credit agreement for a total amount of credit of €6000 repayable in 24 equal monthly Instalments plus an advance payment representing 25% of the initial amount of the credit. Administrative charges of €60 payable on conclusion of the agreement.

The advance payment is never a part of the financing operation. The amount of the credit is then:

$$6000 - 25\% \, x \, 6000 = \ € \, 4500$$

With an interest rate of 9%, the monthly Instalment which provides full repayment of the credit is €205.58.

The equation becomes:

$$4500 = 60 + 205.58\frac{1}{(1+X)^{1/12}} + 205.58\frac{1}{(1+X)^{2/12}} + \cdots + 205.58\frac{1}{(1+X)^{24/12}}$$

or:

$$4500 = 60 + 205.58\frac{1 - \frac{1}{(1+X)^{24/12}}}{(1+X)^{1/12} - 1}$$

giving X= 10.843883%, i.e..: an EIR of 10.8% .

This example illustrates hire-purchases agreements without a special final payment.

EXAMPLE 11

Financial leasing agreement for goods with a price of €20,000 over a period of two years. The agreement stipulates an advance payment of 50% of the price, 23 monthly instalments plus a final payment of 10% of the price. Administrative charges of €60 payable on conclusion of the agreement.

The advance payment is never a part of the financing operation. The amount of the credit is then:

$$20000 - 50\% \; x \; 20000 = \; € \; 10000$$

The payment in month 24 is:

$$A_{24} = 10\% \text{ x } 20000 = € \; 2000$$

Using an interest rate of 9%, the monthly instalment which provides full repayment of the credit is €395.58.

The equation becomes:

$$10000 = 60 + 395.58\frac{1}{(1+X)^{1/12}} + 395.58\frac{1}{(1+X)^{2/12}} + \cdots + 395.58 + 2000\frac{1}{(1+X)^{24/12}}$$

or:

$$10000 = 60 + 395.94\frac{1 - \frac{1}{(1+X)^{23/12}}}{(1+X)^{1/12} - 1} + 2000\frac{1}{(1+X)^{24/12}}$$

giving X= 9.957314%, i.e. an EIR of 10.0%.

This example combines the two special payments from the two previous examples.

EXAMPLE 12

Credit agreement for a total amount of credit of €6000 with two payment periods of 11 and 3 months respectively. Payment of the second-period instalment corresponds to 60% of the first-period instalment. Administrative charges of €60 payable on conclusion of the agreement.

Using the interest rate of 9%, the respective monthly instalments are € 345.99 and € 207.59.

The equation becomes:

$$6000 = 60 + 345.99\frac{1}{(1+X)^{1/12}} + \cdots + 345.99\frac{1}{(1+X)^{11/12}} + 207.59\frac{1}{(1+X)^{12/12}} + \cdots$$
$$+ 207.59\frac{1}{(1+X)^{24/12}} = 60 + 345.99\frac{1}{(1+X)^{1/12}} + \cdots + 345.99\frac{1}{(1+X)^{11/12}} +$$
$$+ \frac{1}{(1+X)^{11/12}}\left[207.59\frac{1}{(1+X)^{1/12}} + \cdots + 207.59\frac{1}{(1+X)^{13/12}}\right]$$

or:

$$6000 = 60 + 345.99\frac{1-\frac{1}{(1+X)^{11/12}}}{(1+X)^{1/12}-1} + 207.59\frac{1}{(1+X)^{11/12}}x\ \frac{1-\frac{1}{(1+X)^{13/12}}}{(1+X)^{1/12}-1}$$

giving X= 10.631509 %, i.e. an EIR of 10.6%.

EXAMPLE 13

Credit agreement for a total amount of credit of €6000 with two payment periods of 11 and 13 months respectively. Payment of the first-period instalment corresponds to 60% of the second-period instalment. Administrative charges of €60 payable on conclusion of the agreement.

Using the interest rate of 9%, the respective monthly instalments are € 203.61 and € 339.35. The second instalment is 1/0.6-1=66.666667% higher than the first instalment.

The equation becomes:

$$6000 = 60 + 203.61\frac{1}{(1+X)^{1/12}} + \cdots + 203.61\frac{1}{(1+X)^{11/12}} + 339.35\frac{1}{(1+X)^{12/12}} + \cdots$$
$$+ 339.35\frac{1}{(1+X)^{24/12}} = 60 + 203.61\frac{1}{(1+X)^{1/12}} + \cdots + 203.61\frac{1}{(1+X)^{11/12}}$$
$$+ \frac{1}{(1+X)^{11/12}}\left[339.35\frac{1}{(1+X)^{1/12}} + \cdots + 339.35\frac{1}{(1+X)^{13/12}}\right]$$

or:

$$6000 = 60 + 203.61\frac{1-\frac{1}{(1+X)^{11/12}}}{(1+X)^{1/12}-1} + 339.35\frac{1}{(1+X)^{11/12}}x\ \frac{1-\frac{1}{(1+X)^{13/12}}}{(1+X)^{1/12}-1}$$

giving X= 10.354709 %, i.e. an EIR of 10.4%.

EXAMPLE 14

Credit agreement for a total amount of credit of €1000 repayable in two Instalments of either €700 after one year and €500 after two years, or €500 after one year and €700 after two years.

The interest rates are 13.90% and 12.32% for the first and the second case respectively.

In the first case the equation becomes:

$$1000 = 700\frac{1}{(1+X)^1} + 500\frac{1}{(1+X)^2}$$

giving X = 13.898667%.

In the second case the equation becomes:

$$1000 = 500\frac{1}{(1+X)^1} + 700\frac{1}{(1+X)^2}$$

giving X = 12.321246%.

According to assumption 5, in those cases where there is a fixed timetable for repayment but the amount of such repayments is flexible, the amount of each repayment shall be deemed to be the lowest that the agreement provides. Hence, we should choose 500 as the first repayment, meaning that the EIR is that of the second case, i.e. an EIR = 12.3%.

This example shows that EIR depends on the payment scheme and that stating the total cost of the credit in the prior information or in the credit agreement is of no benefit to the consumer. Despite the total cost of credit being € 200 in both cases, the borrowing rates are different.

EXAMPLE 15

Credit agreement for a total amount of credit of €1000 repayable in four equal monthly instalments calculated by applying an interest rate of 18%, plus administrative charges of €60 spread over the payments of regular instalments.

The monthly instalment which provides full repayment of the credit is € 259.44, and the monthly instalments are:

$$A = 259.44 + \frac{60}{4} = € 274.44$$

The equation becomes:

$$1000 = 274\frac{1}{(1+X)^{1/12}} + 274.44\frac{1}{(1+X)^{2/12}} + 274.44\frac{1}{(1+X)^{3/12}} + 274.44\frac{1}{(1+X)^{4/12}}$$

or:

$$1000 = 274.44\frac{1-\frac{1}{(1+X)^{4/12}}}{(1+X)^{1/12}-1}$$

giving X= 57.138738%, i.e. an EIR of 57.1%.

EXAMPLE 16

Credit agreement for a total amount of credit of € 6000 repayable in 24 monthly instalments. The interest rate from 5% to 9% in the first year and remains in this new level until the end of the agreement. Administrative charges of €60 payable on conclusion of the agreement.

According to assumption 8, if different interest rates and commissions are offered for a limited period or amount, the interest rate and the commissions shall be deemed to be the highest rate for the whole duration of the credit agreement. Therefore, the EIR of this agreement should be calculated assuming an interest rate of 9% for the 4 years. The result coincides with example 5, which provided an EIR of10.5%.

EXAMPLE 17

Credit agreement for a total amount of credit of €6000 and administrative charges of € 60.

The credit agreement does not stipulate a fixed timetable for repayments and thus, assumption 4 should be applied. Accordingly, it is assumed: a. that the credit is provided for a period of one year, and b. that the credit will be repaid in 12 equal instalments and at monthly intervals.

The monthly payment which provides full repayment of the credit and interest charges in 12 months is € 524.71.

If the agreement stipulates that administrative charges are payable on conclusion of the agreement, the equation becomes:

$$6000 = 60 + 524.71\frac{1}{(1+X)^{1/12}} + 524.71\frac{1}{(1+X)^{2/12}} + \cdots + 524.71\frac{1}{(1+X)^{12/12}}$$

or:

$$6000 = 60 + 524.71\frac{1-\frac{1}{(1+X)^{12/12}}}{(1+X)^{1/12}-1}$$

giving X= 11.461367%, i.e. an EIR of 11.5%.

If the agreement does not stipulate a fixed timetable for the payment of the administrative charges, the charges are included in the equal monthly instalment. The monthly payment then becomes:

$$A = 524.71 + \frac{60}{12} = € 529.71$$

and the equation becomes:

$$6000 = 529.71\frac{1}{(1+X)^{1/12}} + 529.71\frac{1}{(1+X)^{2/12}} + \cdots + 529.71\frac{1}{(1+X)^{12/12}}$$

or:

$$6000 = 529.71\frac{1-\frac{1}{(1+X)^{12/12}}}{(1+X)^{1/12}-1}$$

giving X= 11.342929 %, i.e. an EIR of11.3%.

EXAMPLE 18

Credit agreement for a maximum amount of €1000 for a period of two years. The credit agreement provides for payment of the total cost of the credit every month and repayment of the total amount of the credit at the end of the agreement. Administrative charges amount to 0.25% of the credit limit per month.

The assumption 1, that the amount of credit is drawn down immediately and in full applies here and to the rest of examples, which also refer to revolving credit agreements.

Also, as indicated at the beginning of the document, in these examples the interest rate is assumed to be given as an effective rate of 12%.

For this example, the monthly interest charges, calculated on the basis of the equivalent monthly rate as explained, are:

$$100\ x\ \left[(1+r)^{1/12}-1\right] = 100\ x\ \left[(1+0.12)^{1/12}-1\right] = 1000\ x\ 0{,}9488793\% = €9.49$$

and the monthly payment of interest and commissions:

$$A = 1000\ x\ (0{,}9488793\% + 0.25\%) = €\ 11.99$$

The equation becomes:

$$1000 = 11.99\frac{1}{(1+X)^{1/12}} + 11.99\frac{1}{(1+X)^{2/12}} + \cdots + 11.99\frac{1}{(1+X)^{23/12}} + (11.99+1000)\frac{1}{(1+X)^{24/12}}$$

or:

$$1000 = 11.99\frac{1-\frac{1}{(1+X)^{24/12}}}{(1+X)^{1/12}-1} + 1000\frac{1}{(1+X)^{24/12}}$$

giving X= 15.37578%, i.e. an EIR of 15.4%.

This example is representative of some revolving credits.

EXAMPLE 19

Credit agreement for a maximum amount of €1000 in the form of an overdraft facility. The credit agreement does not impose any requirements in terms of repayment of principal, but provides for monthly payment of the total cost of the credit. Administrative charges amount to €2.5 per month.

According to assumption 9, which applies specifically to overdraft facilities, second sentence, if the duration of the credit agreement is not known, as is the case in this example, the effective interest rate shall be calculated on the assumption that the duration of the credit is three months.

Similar to the previous example, the monthly payment of interest and commissions is given by:

$$A = 1000\ x\ 0{,}9488793\% + 25\% = €\ 11.99$$

and the equation now becomes:

$$1000 = 11.99\frac{1}{(1+X)^{1/12}} + 11.99\frac{1}{(1+X)^{2/12}} + (11.99+1000)\frac{1}{(1+X)^{3/12}}$$

or:

$$1000 = 11.99\frac{1-\frac{1}{(1+X)^{3/12}}}{(1+X)^{1/12}-1} + 1000\frac{1}{(1+X)^{3/12}}$$

giving X= 15.375765%, i.e. an EIR of 15.4%.

EXAMPLE 20

Credit agreement for an open-end credit for a maximum amount of €1000. The credit agreement provides for payment of a fixed amount of €100 every month until the complete repayment of the credit is made. Administrative charges of €25 payable on conclusion of the agreement.

Although the credit agreement has an unlimited period of validity (open-end credit), the immediate draw down of the full amount of the credit and the scheme of the repayments determine that the credit is completely repaid in 11 months.

According to the amortization table, the amount of the last payment is only A11=55.77, which corresponds to the amount owed at the end of month 11.

The equation becomes:

$$1000 = 25 + 100\frac{1}{(1+X)^{1/12}} + 100\frac{1}{(1+X)^{2/12}} + \cdots + 100\frac{1}{(1+X)^{10/12}} + 55.77\frac{1}{(1+X)^{11/12}}$$

giving X= 18.151662%, i.e. an EIR of 18.2%.

This example is representative of some credits in the form of credit cards.

EXAMPLE 21

Credit agreement for an open-end credit for a maximum amount of €1000. The credit agreement provides for payment of the total cost of the credit every month plus a minimum monthly payment of 20% of the outstanding loan with a minimum of €20. Administrative charges of €25 payable on conclusion of the agreement.

Although the credit agreement has an unlimited period of validity (open-end credit), the immediate draw down of the full amount of the credit and the scheme of the repayments determine that the credit is to be completely repaid in 16 months.

The 16 monthly repayments can be obtained from the amortization table, being A1 = 209.49; A2 = 167.59; A3 = 134.07; A4 = 107.26; A5 = 85.81; A6 = 68.65; A7 = 54.92; A8 = 43.93; A9 = 35.15; A10 = 28.12; A11 = 22.49; A12 = 20.82; A13 = 20.63; A14 = 20.44; A15 = 20.25; A16 = 5.96.

Note that the last repayment might be lower than the minimum amount if the amount owed is lower than the minimum amount.

The equation becomes:

$$1000 = 25 + 209.49\frac{1}{(1+X)^{1/12}} + 167.59\frac{1}{(1+X)^{2/12}} + \cdots + 20.25\frac{1}{(1+X)^{15/12}} + 5.96\frac{1}{(1+X)^{16/12}}$$

giving X= 19.633825%, i.e. an EIR of 19.6%.

This example is representative of some revolving credits and credit cards.

EXAMPLE 22

Open-end credit for an amount of €1000. The credit agreement provides for payment of the total cost of the credit every month plus a minimum monthly payment of 20% of the outstanding loan with a minimum of €20. Administrative charges of €25 payable on conclusion of the agreement plus monthly insurance costs given as 1.5% of the outstanding loan.

Although the credit agreement has an unlimited period of validity (open-end credit), the immediate draw down of the full amount of the credit and the scheme of the repayments determine that the credit is completely repaid in 16 months.

The 16 monthly repayments can be obtained from the amortization table, being A1 = 224.49;

A2 = 179.59; A3 = 143.67; A4 = 114.94; A5 = 91.95; A6 = 73.56; A7 = 58.85; A8 = 47.08; A9 = 37.66; A10 = 30.13; A11 = 24.10; A12 = 22.10; A13 = 21.61; A14 = 21.12; A15 = 20.63; A16 = 6.04.

Note that the last repayment might be lower than the minimum amount if the amount owed is lower than the minimum amount.

The equation becomes:

$$1000 = 25 + 224.49\frac{1}{(1+X)^{1/12}} + 179.59\frac{1}{(1+X)^{2/12}} + \cdots + 20.63\frac{1}{(1+X)^{15/12}} + 6.04\frac{1}{(1+X)^{16/12}}$$

giving X= 43.239947%, i.e. an EIR of 43.2%.

This example is representative of some revolving credit and credit cards.

EXAMPLE 23

Open-end credit agreement for an amount of €1000. The credit agreement provides for payment of the total cost of the credit every month plus a minimum monthly payment of 20% of the outstanding loan, with a minimum of €20. The administrative charge payable on conclusion of the agreement is €25.

Although the credit agreement has an unlimited period of validity (open-end credit), the immediate draw down of the full amount of the credit and the scheme of the repayments determine that the credit is to be completely repaid in 16 months.

The 16 monthly repayments can be obtained from the amortization table, being A1 = 201.90; A2 = 163.05; A3 = 131.68; A4 = 106.34; A5 = 85.88; A6 = 69.36; A7 = 56.01; A8 = 45.23; A9 = 36.53; A10 = 29.50; A11 = 23.83; A12 = 20.00; A13 = 20.00; A14 = 20.00; A15 = 20.00; A16 = 18.00.

Note that the last repayment might be lower than the minimum amount if the amount owed is lower than the minimum amount.

The equation becomes:

$$1000 = 25 + 201.90\frac{1}{(1+X)^{1/12}} + 163.05\frac{1}{(1+X)^{2/12}} + \cdots + 20.00\frac{1}{(1+X)^{15/12}} + 18.00\frac{1}{(1+X)^{16/12}}$$

giving X= 19.343775%, i.e. an EIR of 19.3%.

This example is representative of some examples of revolving credits and credit cards.

EXAMPLE 24

Credit agreement for an open-end credit for a maximum amount of €1000 involving the use of a card for drawdowns. The credit agreement provides for the payment of total credit cost every month, plus a minimum monthly payment of 20% of the outstanding loan, with a minimum of €20. The annual cost of the card linked to the credit facility is €25. The interest rate is 0% for the first instalment and 12% for the subsequent instalments.

According to assumption 8, if different interest rates and commissions are offered for a limited period or amount, the interest rate and the commissions shall be deemed to be the highest rate for the whole duration of the credit agreement. Therefore, the EIR of this agreement should be calculated assuming an interest rate of 12% for the whole duration of the credit agreement.

Although the credit agreement has an unlimited period of validity (open-end credit), the immediate draw down of the full amount of the credit and the scheme of the repayments determine that the credit is to be completely repaid in 16 months.

The 16 monthly repayments can be obtained from the amortization table, being A1 = 226.90; A2 = 163.05; A3 = 131.68; A4 = 106.34; A5 = 85.88; A6 = 69.36; A7 = 56.01; A8 = 45.23; A9 = 36.53; A10 = 29.50; A11 = 23.83; A12 = 20.00; A13 = 45.00; A14 = 20.00; A15 = 20.00; A16 = 18.00.

Note that the last repayment might be lower than the minimum amount if the amount owed is lower than the minimum amount. Also, the cost of the card is charged at the beginning of each year (in advance), being payable at periods 1 and 13.

The equation becomes:

$$1000 = 226.90\frac{1}{(1+X)^{1/12}} + 163.05\frac{1}{(1+X)^{2/12}} + \cdots + 20.00\frac{1}{(1+X)^{15/12}} + 18.00\frac{1}{(1+X)^{16/12}}$$

giving X= 25.49955%, i.e. an EIR of 25.5%.

This example is representative of some credit cards.