International Financing Decision: A Managerial Perspective

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Abstract

International financial decision is not a simple one and it is mainly characteristic to multinational companies or to companies located in countries with a reduced saving rate that is not sufficient to cover all internal financing needs (is the case of emerging markets like Romania is). The financial managers of Romanian companies need to have tools to decide if they will use a credit in lei from local banks or will try to obtain a credit from abroad in a foreign currency (in Euro, USD etc.). The required assumption in this case is that capital account between Romania and other countries is totally free. This decision is not a simple one and it should be based on theoretical background. The financing decision depends upon two main criteria: cost and risks assumed by the company. This paper will discuss the solution in this case to compare different international financing opportunities that are expressed in different currencies from the perspective of a debtor (company).

Keywords: *International Cost of Capital, International Capital Budgeting, International Credit, International Financing Decision*.

JEL classification: G15; G21; G32; M16.

Introduction

Any business financing operation is based on a project idea. Any project is initiated by sponsors or by stakeholders and it is oriented to fulfil the market needs (local or global markets). The financial intermediaries developed a lot of mechanisms and financing techniques that could be used to cover long term or short term financing needs. The companies could now switch between internal financing alternatives (reinvested profit, amortization, conversion of debt into equities, increase of capital by internal subscription made by existing stockholders) and external ones (credit mainly for short term horizon and bonds / equities for long term horizon). The use of internal resources is claimed when the company is in its first years of operation; the company operates with low tangibility of its assets (no fixed assets); the company has a high financing leverage or when the company has no intention to become transparent or dependent upon different stakeholders or new equity holders (Harrison et al, 2004). The external resources are used when the company needs important capital resources that could not be produced internally; when is a very attractive for external capitalists or creditors (good rating); when this company has a lot of fixed assets to be used as collateral (Fisman and Love, 2007). There are few differences in terms of costs between internal and external financial sources: the

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internal sources have as cost taxation (income tax, dividend tax, profit tax that could be flat or progressive) and the cost of opportunity (to decide to finance your own business with a lower rate of return instead of withdraw money from it and investing them on capital markets or in other companies); the external sources are submitted to have a fixed income (interest rate for credit, coupon rate for bonds) or a variable one (dividends) that depends on the profit of the company (see more about the impact of taxation on the financing strategy in Schreiber, 2002; Barbuta-Misu, 2009; Egger et al, 2010). The volatility of interest rate and the increased level of economic contagion between foreign markets revealed the necessity to use a variable interest rate (or coupon) for more and more credit schemes. Financial market sophistication and development is also very important for the capital allocation through financing channels (see Wurgler, 2000; Love, 2011). On the other hand, too much sophistication (securitization, depositary receipts) is indicated to be factor of crisis contagion (see Kiraly et al., 2008; HyunSong, 2009; Kapil & Kapil, 2009). Finally, it is very important to say that the financing decision is very connected to the innovation problem (or market success): those companies that are more innovative will have lower financing constraints that the regular business (more financing opportunities for innovative business like venture capital, business angels, pension funds, investment funds are).

1. Global business financing during crisis

The current crisis reduced the volume of sales and the borrowing capacity of the companies. The companies became more and more financially leveraged, operating with lower liquidity. Capital markets significantly decreased in terms of market volume and market returns: McKinsey Global Institute Report (2011) indicated that the total global financial stock in 2008 decreased to only 175 trillion of $ from 201 trillion in 2007 but it grew again in 2009 and 2010 until similar pre-crisis volume of 212 trillion $ in 2010 (Figure 1 and 2). This evolution is explained not by private unsecured loans, but by an increase in the public debt outstanding and stock market capitalization (Japan at the end of 2011 registered a public debt of 226% of GDP, Greece has 132% of GDP, Italy 111% of GDP; UK and USA remain also at a very high level of public debt with a value around 80% from GDP). In countries like UK and Ireland not only public sector is problematic; the banking sector registers record values for their debt of 259% of GDP in case of Ireland and 219% in case of UK.

Not all markets resisted well to the current crisis that adjusted significantly the stock market prices, correcting a lot the abnormal inflated prices from the previous boom period. The major part of stock market indices remain low profitable and even high non-profitable due to the persistence of crisis.

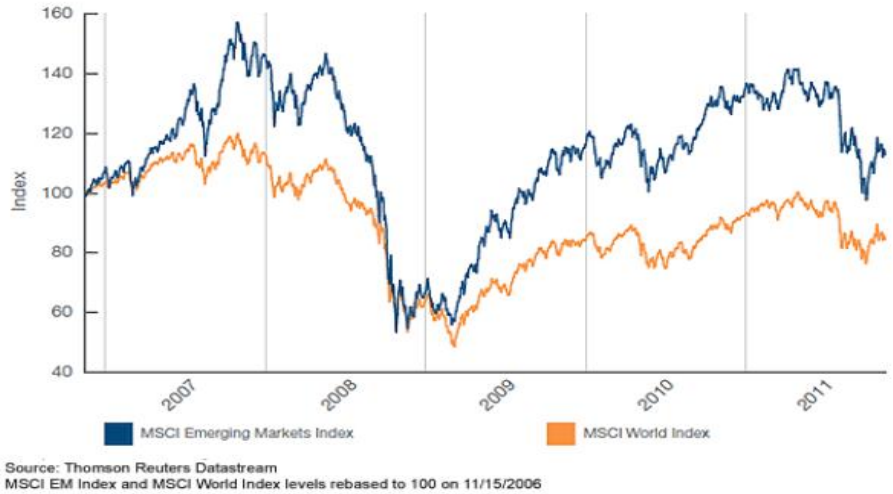


Figure 1. MSCI Index returns – comparative analysis between emerging markets and global situation

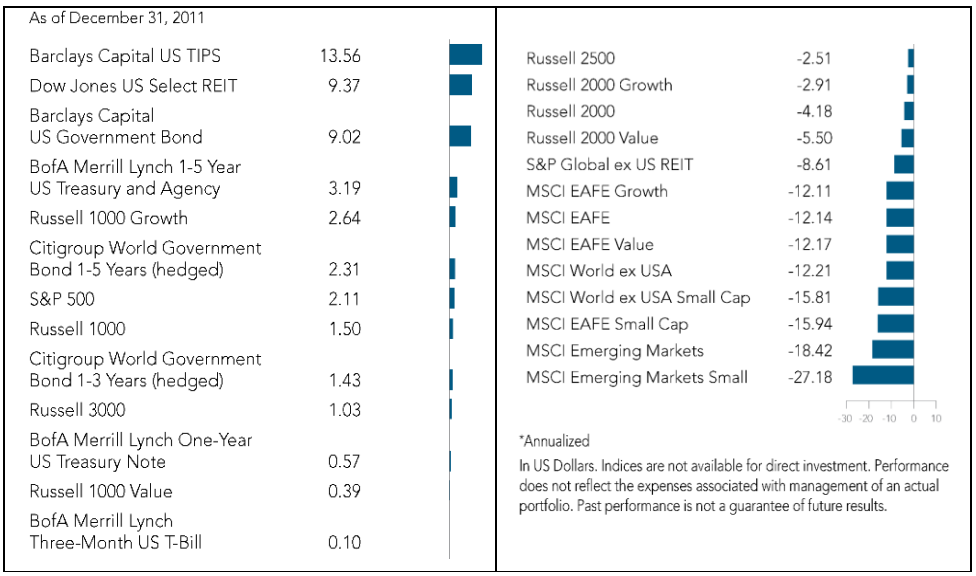
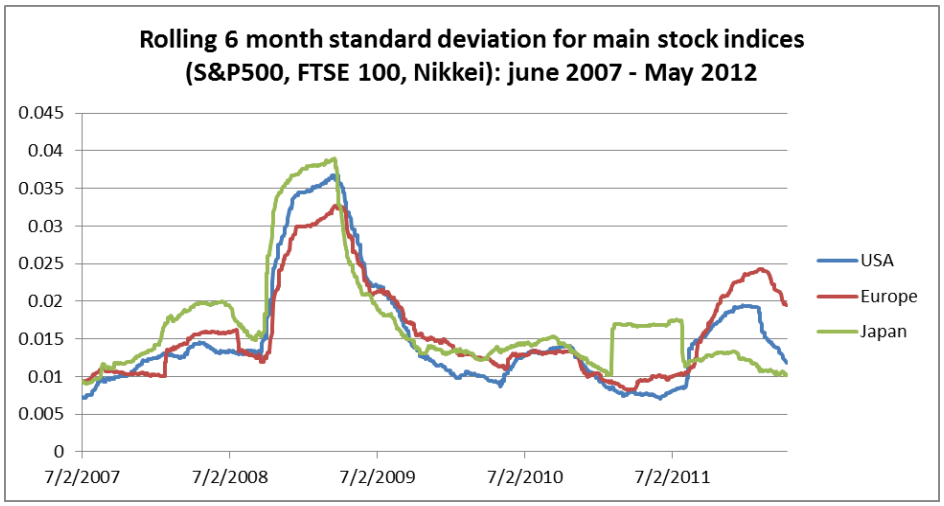


Figure 2. Comparative analysis between stock market indices
Source: Bryan Harris, 2011

In the same time, global capital markets significantly increased in terms of volatility during crisis and still kept the same volatility for a long term (a simple computation of rolling standard deviation for major financial markets proved that during crisis period the volatility was 3 of 4 times higher and this problem seems not to totally solved – see Figure 3; another observation is related to the high

correlation between markets that reflects the existence of contagion effect; the period with high volatility is correlated with low profitability for investors).



Source: own estimations based on market data available for indices

Figure 3. Comparative analysis of international markets' volatility

In the low market liquidity and high market volatility context, the global financing strategies were reconsidered. The volatility of exchange rates and interest rates induced a very high risk aversion and determined structural changes not only in the companies behaviour regarding international financing sources compared with local ones but regarding the use of internal sources compared with external ones (credit, equities compared with reinvested profit).

2. International financing decision: managerial considerations

The access of international financial markets to finance a local business is not a simple decision. As in the case of international marketing decision (when you want to diversify your markets by exporting your products), it is a very sensitive problem to decide if you will develop your business by borrowing money from abroad. First of all, we should make a difference between short term international financings (mainly credit used to finance receivables or to finance the commercial credit) and long term international financings (used for buying capital goods and for the development of the company). Secondly, we should mention that a lot of capital goods that are coming from abroad (having high costs and long term financing requirements associated) are sold with a financing scheme already attached (like seller credit or buyer credit are). In this case, the decision is very simple to be taken. On the other hand, the international financing decision could be recommended when a company is involved in international business (the exports will ensure the necessary foreign currency to pay back the external loan without being exposed to any substantial risk).

Ultimately, the main criteria that are reconsidered by financial managers in their decision to borrow capital from local banks (in local currency) instead of borrowing capital from abroad (in different foreign currencies) are the following: the associated cost to such financing alternative and the associated risk. In the case of la local financing solution the risks that are associated are only interest rate risk (for a variable interest loan the risk is to have an increased interest rate in the future) and default risk (do not have the enough cash flows to pay back de amounts due to the bank). International financing solution will include additional risks: country risk (the company will be in the impossibility to pay back an international low due to the restrictions imposed for international money transfers or restrictions applied to foreign exchange market; the investors will have limitations in transferring the dividends abroad or in adjusting their portfolio investments) and foreign exchange risk (for the debtor, the risk is to face with a local currency depreciation that will increase the total cost of financing). Normally only interest rate risk and currency risk are associated to the debtor position. The other risks (country risk and default risk) are associated only to the creditor or investor position (seems to be solely a problem of the bank in this case). In fact, all these risks are important for financing decision. There are specific tools that could be used to assess the exposure to such specific risks.

Regarding the cost problem associated to an international financing alternative this is more complex due to the existence of different currencies that make difficult comparative cost analysis. The financing theory developed two fundamental tools to be used in the evaluation of financial assets and liabilities: net present value (NPV) and internal rate of return (IRR, in this case will be calculated on a liability and will be not a return but a cost element).

The net present value criterion: is based on all future cash flows generated by international financing schemes (annuities that could be finite in case of a credit or bond issue and infinite in case of equities without maturity). This indicator is calculated according with the following formula:

$$NPV_{financing} = +C_0 \times s_0 - \sum_{n=1}^{Maturity} \frac{A_n \times s_n}{(1+k_s)^n} \qquad (1)$$

Where: C_0 is the initial amount of money expressed in currency S, s_0 is the initial exchange rate, s_n is forecasted exchange rate for next period, A_n are annuities from the table of amortization and include principal plus interest rate if we are analysing an international credit, k_s is the discount rate.

From the presented formula we can observe that NPV is sensitive to the computation of discount rate. In this case (international financing decision) financial managers should use an estimated (predicted) interest rate for the future. In fact, discount rate *expresses the expectations of borrower in terms of interest rate* (that is normal to be different that the interest rate communicated by the bank in their offer that is based on the estimations of the bank). For investment decision the discount

rate will be the cost of capital but for the financing decision this discount rate should be derived from the borrower's market expectations. The interpretation of such indicator is very simple: a higher NPV means a better financing alternative. The sign is not important in this case (it is a different situation than the case of investment where the sign should be always positive). Another observation is related to the fact that, when we want to compare a credit in Euro with a credit in USD, we will have a problem with the comparison of those NPVs expressed in different currencies:

Credit in Euro **Credit in USD**

$$NPV_{financing} = +C_0 \times s_0^{Euro} - \sum_{n=1}^{Maturity} \frac{A_n \times s_n^{Euro}}{(1+k_{Euro})^n} \qquad NPV_{financing} = +C_0 \times s_0^{USD} - \sum_{n=1}^{Maturity} \frac{A_n \times s_n^{USD}}{(1+k_{USD})^n}$$

The discount rates will be different because we deal with different currencies (Euro and dollar) having different evolutions. The idea is to obtain a NPV in the same currency to have the possibility to compare. The following methods could be used in this case:

- *Method 1: To estimate the discount rate for Euro and discount rate for USD and use the initial exchange rate (Euro / USD) to convert NPVs in the same currency:* in this case the only thing that should be done is to obtain your own estimation about interest rates in the future and to calculate discounted annuities for each credit in their own currency and after that to transform the NPV of credit denominated in Euro into dollars or vice versa, in order to be compared using current exchange rate (this solution is logical one by considering that all annuities are transformed into current value of money using discounting method). The financial manager will select the financing alternative having higher NPV (for example, a NPV of – 2000 Euro is better than NPV of – 5000 Euro suggesting the fact that in first case we will pay less in Euro than in the second one, in current value of Euro).
- *Method 2: To estimate one discount rate (for instance for Euro) and the evolution of exchange rare (Euro / USD) to convert the annuities of the credit in USD into Euro and after that to discount them with estimated discount rate*: in this case, the financial manager will not estimate two interest rates, but will try to estimate only one of them (is recommended to use the local interest rate that is more understandable than foreign interest rates) and exchange rate (is recommended to forecast the exchange rate of the local currency against foreign currencies). The comparative analysis between different financing alternatives will suppose the estimation of annuities, the transformation of them in a common currency using predicted exchange rate and discounting of them using the predicted discount rate. Therefore, financial manager will have the possibility to compare between two financing alternatives,

the NPVs being expressed in the same currency and in present values. The highest value will indicate the best solution. These results should be closed to the previous method due to the strong relationship between exchange rate and interest rates differential (interest power parity theory; Harvey, 2006).

- *Method 3: To estimate two discount rates (in fact, two prediction regarding interest rate from the perspective of the debtor) and the exchange rate*. This proposed method is a combination between the first methods and it is more complex due to the estimations of three macroeconomic variables: two interest rates and one exchange rate (for an analysis involving only two different currencies). This method is recommended when the exchange rate does not reflect the interest rate differential (those countries with high restrictions on capital account for instance). In this case, the financial manager will estimate the annuities from the amortization tables, will use the discount rates to discount those annuities and will transform NPVs in the same currency by using not initial exchange rate (like in the first method) but an average calculated value. The financing alternative with highest NPV will be the best solution in this case.

The NPV criterion is very sensitive to the discount rate estimation. From the perspective of debtors, this discount rate is difficult to be different from the interest rate provided by the bank after the debtor's analysis (the asymmetry of information between lenders and borrowers). An easy solution is to use as discount rate the interest rate provided by the bank, simply considering that a debtor couldn't have a different expectation in terms of interest rate. The results based on NPV criterion will be inconclusive (Osborne, 2010).

The internal rate of return criterion: is the second criterion that could be used to compare two international financing alternatives. This indicator is important for financing decision from two perspectives: 1. It gives the possibility to compare between different financing alternatives and to select the best alternative from them; 2. It provides the best measure for the cost of capital for each financing alternative that finally will be integrated into weighted average cost of capital formula (that will be used to evaluate the whole investment project). Any measure of cost of capital is based on this IRR indicator (excepting the case of equities that are based on other kind of models, mainly due to the absence of maturity in that case – like CAPM models are). The problem with IRR criterion is related to the difficulty of estimating it. The estimation of IRR is based on NPV equation, IRR being the solution of NPV = 0. For a credit or bond issue with 10 years maturity will be very difficult to calculate such solution. For this reason, the IRR value is always approximated by using a trial based procedure: for a high value of discount rate is obtained a positive value of NPV associated to a financing alternative and for a small value it is obtained a negative value for NPV. Based on these estimations, it is assumed a linear connection between those values and it is approximated an IRR value by using the following formula:

$$\text{NPV} = 0 \Leftrightarrow NPV_{financing} = +C_0 \times s_0 - \sum_{n=1}^{Maturity} \frac{A_n \times s_n}{(1+k_s)^n} = 0 \qquad (2)$$

$$\text{IRR}_{\text{financing(cost)}} \approx \frac{\text{NPV}^- \times k^+ + \text{NPV}^+ \times k^-}{\text{NPV}^- + \text{NPV}^+} \qquad (3)$$

Internal rate of return in this case is not an expression of a return. It is a measure of the cost of capital associated to an international financing alternative. In this case, the financial manager will select that financing alternative providing the lower cost of capital (lower IRR).

Credit in Euro **Credit in USD**

$$\text{Cost}_{\text{Credit Euro}} \approx \frac{\text{NPV}^- \times \text{k}^+ + \text{NPV}^+ \times \text{k}^-}{\text{NPV}^- + \text{NPV}^+} \qquad \text{Cost}_{\text{Credit USD}} \approx \frac{\text{NPV}^- \times \text{k}^+ + \text{NPV}^+ \times \text{k}^-}{\text{NPV}^- + \text{NPV}^+}$$

Looking the formula of the cost of capital we can observe that exchange rate is not relevant in this case. The fact that the credits are denominated in different currencies seems to have no influence on the cost of credit. But the results are totally different if we will denominate the annuities used in NPV formula in the same currency or we are ignoring the problem of exchange rate in this case. Because cost of capital calculated in such manner is only a mathematical compromise to obtain a result for very complex equations, the way of calculating NPV^+ and NPV^- remain sensitive to this problem of exchange rate.

Instead of ignoring this problem, it is better to estimate an exchange rate and to transform, from the beginning, all the annuities of different international financing alternatives into a single currency (it is recommended that this currency to be the local currency of the debtor). The cost of capital obtained by doing this is more accurate than in the case of computing cost of capital without taking into consideration the volatility of exchange rate in time. So, in case of cost of capital estimation, the annuities will be transformed into a selected currency (before doing this we should estimate the exchange rate) and the same values for discount rate (k^+ and k^-) will be used to approximate the cost of capital using the proposed formula. Only by doing this the results become comparable and the solution will be not inconclusive or subject to error.

In financing and decision theory there is also a strong debate regarding the supremacy of NPV or IRR criterion in investment decision (and why not, in financing decision). Beside the difficulties in estimating discount rate (for NPV criterion) and IRR computing problems (including multiple IRR problem), there is other problem related to the fact that both criteria are sensitive to the dimension of the investment project of financing alternative (NPV is favourable to big scale investment project that will return a higher value for this indicator and favourable with lower financing values). The inconsistences in this case will be solved by starting the entire analysis from the same and comparable initial conditions.

3. Empirical illustration of international financing decision

For the sake of clarifying more the theoretical aspects discussed in this paper, it is proposed an empirical illustration of the problems associated to international financing decision. Let suppose that a Romanian company is interested to develop a business idea and started a feasibility study about a new production facility. The value returned by this study as total investment is 1.000.000 Euro (including all costs with construction, machineries, permits, infrastructure etc.). Starting from this total investment value, the financial manager will propose an optimal capital structure in accordance with different factors (taxation, tangibility of assets, non-tax shield etc.). Let suppose that the solution is to finance the project in the following manner: 30% credit from the banks with 5 years maturity (300.000 Euro); 50% bond issue with 5 years maturity (500.000 Euro) and 20% equities with no maturity (200.000 Euro). This is also a very sensitive problem that should be solved in different ways (one solution could to study the experience of competitors in similar projects).

The next step in international capital budgeting efforts is to obtain different offers from different banks. Let suppose that the company obtained the following three offers (1 from a local bank and 2 from foreign banks from Europe and USA):

Table 1. Empirical illustration: international credit offers

Bank A (local)	Bank B (from EU)	Bank C (from USA)
1.350.000 ROL 5 years maturity 14% interest rate annually paid no grace period Reimbursement: final instalment	300.000 Euro 5 years maturity 10% interest rate annually paid 2 years of grace period Reimbursement: equal tranches	450.000 USD 5 years maturity 12% interest rate annually paid no grace period Reimbursement: equal annuities
No initial exchange rate	Initial exchange rate: 4.5 ROL / Euro	Initial exchange rate: 3 ROL / Euro

The first step in our analysis is to fulfil the table of amortization for all three credits and to obtain the annuities for each of them (expressed in different currencies in this case – See Appendix 1).

The annuities associated to each financing alternatives are the following (expressed in different currency at this moment of our analysis):

Table 2. Annuities of selected international credits

Years	Credit A (ROL)	Credit B (Euro)	Credit C (USD)
1	189000	0	124834
2	189000	0	124834
3	189000	157300	124834
4	189000	145200	124834
5	1539000	133100	124834

The first criterion that should be applied is NPV criterion. In this case we need to decide which method we use. For this case study is proposed the second method in which all annuities are expressed in the local currency. Therefore, for decide between international financing alternatives we need to have the following information:

- A prediction of interest rate for next five years for ROL (that is the local market for the debtor in this case)
- A prediction of exchange rate for the next five years against Euro and against USD.

Without knowing these two variables the international financing decision will be significantly confused and the entrepreneurial error in this case could be very high.

Using specific explanatory factors for both variables and different econometric tools (trends, autoregressive models, multiple regressions) it is possible to obtain such forecasts (the assumptions in this case are presented in Table 3).

Table 3. Assumptions regarding exchange rate and discount rate (expected interest rate)

Discount rate for ROL (5 years average): ▪ 11% per year. This value will be used to discount all annuities expressed in ROL.
Expected exchange rate volatility (5 years average): ▪ ROL / Euro: depreciation of ROL with 4% per year ▪ ROL / USD: depreciation of ROL with 2% per year

According with these assumptions it is possible now: [1] to estimate the exchange rate for each year; [2] to discount the annuities using the discount rate for local currency; [3] to compute present value and net present value for the three credit alternatives (two of them being from abroad). The results are presented in Table 4.

Table 4. NPV analysis for international financing alternatives

Annuities in ROL (local currency)

Years	Credit A (ROL)	Credit B (Euro)	Credit C (USD)	Discounting Factor
1	189000	0	381993	0.901
2	189000	0	397273	0.812
3	189000	796235	413164	0.731
4	189000	764386	429690	0.659
5	1539000	728714	446878	0.593

Discounted annuities in local currency

Years	Credit A (ROL)	Credit B (Euro)	Credit C (USD)
1	170270	0	344138
2	153397	0	322436
3	138195	582200	302102
4	124500	503524	283050
5	913322	432456	265200
Present value	**1499684**	**1518181**	**1516926**
Initial credit	**1350000**	**1350000**	**1350000**
NPV	**-149684**	**-168181**	**-166926**

According with these results, we can find a very interesting result the best financing alternative will be the credit in ROL (that have the highest interest rate in the offer of the bank). The credit with lower interest rate (Credit B in Euro) is the worst solution in this case for the Romanian company (a lot of Romanian companies were attracted in 2006 and 2007 to use credits denominated in foreign currency from local or international financial markets by simply taking into consideration only the interest rate from the offer of the banks and not running such complex analysis to improve their decisions). Net present value criterion is very effective because could include the exchange rate volatility and already includes the time value of money (the flows are discounted).

The other international financing decision criterion is the measure of cost of capital performed on the annuities expressed in the same currency (in accordance with the proposed methodology). These annuities should not be discounted and should indicate if there is a negative or positive financial flow (this is indicated by the sign, initial credit obtained by the company being positive inflow of capital and all annuities paid in the future being negative outflows). Ignoring the sign will create a confusion and will return an error if we will try to determine such indicator. The results obtained in this case for all three credits are presented in Table 5.

Table 5. Cost of capital analysis for international financing alternatives

Not discounted but expressed in ROL

Years	Credit A (ROL)	Credit B (Euro)	Credit C (USD)
Initial	1350000	1350000	1350000
1	-189000	0	-381993
2	-189000	0	-397273
3	-189000	-796235	-413164
4	-189000	-764386	-429690
5	-1539000	-728714	-446878
Cost of capital	**14.0%**	**14.4%**	**15.7%**
Interest rate	**14%**	**10%**	**12%**
Gap	**0.0%**	**4.4%**	**3.7%**

As we can observe, the cost of capital analysis returned that the best alternative is to use local financing instead of international financing. The gap between computed cost of capital and interest rate from the offer of the bank is determined by the volatility of exchange rate. In case of the credit in ROL (local currency) this is zero but in fact is different than zero due to the fact that cost of capital is only approximated by using a mathematical reduction for complex equation and assuming a linear shape for this variable.

These results reflect another very important observation: cost of capital is inconclusive to be used for deciding which financing alternative is better. For instance, a credit in local currency with different conditions (grace period, different reimbursement methods) will provide the same cost of capital but a different NPV. Consequently, the analysis based only on cost of capital could be a mistake for financing decision. NPV seems to provide better accuracy. The suggestion is to use NPV criterion only for selection among different international financing alternatives and, therefore, to determine the cost of capital associated to selected financing alternative by solving the equation NPV=0 (similar with IRR analysis).

Conclusions

International financing decision is not simple and requires specific tools to be well founded. The main tools are derived from general theory of finance and should include the time value of money assumptions (discounting of future flows). When we want to compare among different international financing alternatives we have a problem with the comparability of data and indicators calculated on financial flows expressed in different currencies. Even the discounting methodology involves few problems if we take into consideration that the discount rates are different for different currencies, that there is a possible relationship between these discount rates (derived from international CAPM models) and that there is a possible relationship between discount rates and exchange rates (assuming that discount rate is assimilated to the expectations in terms of interest rates). There are few solutions that could be used to improve the methodology and to ensure a better accuracy to such analysis (that are presented in this paper). International approach of financing operations generates more doubts about the effectiveness and appropriateness of NPV and IRR indicators (in this case is not a problem of "return" but a problem of "cost").

This study emphasizes also the massive entrepreneurial error that could be induced by uncontrolled monetary policies run by different countries. This massive monetary chaos induces a huge uncertainty in forecasts regarding interest rates (that provide the discount rate) and exchange rates. Initially, the volatility of exchange rate was inexistent for currencies denominated 100% in gold and without money produced from nothing. Moreover, without the production of money induced as "capital" in the financial system, the volatility of interest rate was lower (the prediction about future chances were made with higher accuracy). Today, any attempt to assess such variables is subject to fail. A higher maturity (10 years

instead of 5 years or 3 years) will complicate more the decision and the forecasts. This study revealed the importance of macroeconomic variables on microeconomic field and the fact that an important source of entrepreneurial error is induced by the monetary decisions and actions performed by central banks together with commercial banks (all of them being involved in the money production process). This more and more volatile world in terms of interest rates and exchange rates will finally destroy real business and will reduce the capacity of entrepreneurs to search for profitable opportunities. The economic calculus is significantly altered and more and more crisis will occur.

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Appendix 1

Amortisation tables for the three financing alternatives included in the case study

Credit 1350000 ROL

Interest r. 14%

Years	Principal	Interest	Annuities	K reimb.
1	0	189000	**189000**	1350000
2	0	189000	**189000**	1350000
3	0	189000	**189000**	1350000
4	0	189000	**189000**	1350000
5	1350000	189000	**1539000**	0

Credit 300000 Euro

Interest r. 10%

Years	Principal	Interest	Annuities	K reimb.
1	0	0	**0**	330000
2	0	0	**0**	363000
3	121000	36300	**157300**	242000
4	121000	24200	**145200**	121000
5	121000	12100	**133100**	0

Credit 450000 USD 124834.4 = Const. annuity

Interest r. 12%

Years	Principal	Interest	Annuities	K reimb.
1	70834	54000	**124834**	379166
2	79335	45500	**124834**	299831
3	88855	35980	**124834**	210976
4	99517	25317	**124834**	111459
5	111459	13375	**124834**	0

Note: For the credit in Euro with grace period we considered that in this period there are no any payments to be made (no interest paid, no principal reimbursed)