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# Transparency in Consumer Credit. The usage of the APR

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## Abstract

The role of Annual Percentage Rate (APR) in installment plan selection was investigated. The choice of analyzing APR was motivated by its wide diffusion due to the mandatory disclosure acts. There have been doubts towards consumer understanding of APR.

A sample of 299 consumers were given five series of credit alternatives. The descriptions of the loans were homogeneous and regarded amount borrowed, duration, monthly installment, APR, total repayments, and opportunity cost of capital. Consumers were asked to select a credit option for each series clarifying the motivations of their choice.

The ability to select the loan with the highest Net Present Value (NPV) was ascertained. It depends on the awareness of (i) opting for the lowest APR, that is also less than the opportunity cost of capital; and (ii) demanding the extension of the repayment period to improve the convenience of the identified competitive rate.

The analysis attested consumer failure to single out the loan with the highest NPV. The reason should be a considerable lack of information about the usage of APR: participants selected the lowest rate but they neglected to consider the opportunity cost of capital and the extension of the repayment period. Furthermore, they sometimes chose the loan contrasting duration and monthly borrowing costs. APR usage may therefore be inapt since employed as a substitute for the monthly installment payment. An overlap between economic convenience and financial sustainability could explain this phenomenon. To improve disclosure, further (or different) borrowing cost measures should be placed in credit advertisements.

This is one of the few studies that measure ability to select installments plans considering effects of information availability.

*JEL classification:* G21, G28, D82

*Keywords:* Borrowing, Decision making, Consumer behavior, Disclosure, Information, Loans

## 1. Introduction

Several studies have addressed the issue of consumer credit. Its influence upon banks' profits, factors that inspired borrowing decisions, and the over-borrowing have been investigated. More recently, a part of applications have dealt with the theme of transparency of loan conditions. These applications have examined the relationship that exists between asymmetries and competition. They have also explored the effect of information disclosure on loan comparisons. There are two preeminent reasons why more attention is being paid to these topics: firstly, the weakening of the oligopolistic structure of the credit market, which has induced credit providers to avail themselves of new competitive levers; secondly, the renewed guidelines on supervisory, which are now more focused on promoting individual comparative skills and obstructing events of information overload.

The present work examines the effects of information availability on installment plan selection with the intent of adding to studies on transparency. Particularly, the role of Annual Percentage Rate (APR) was investigated. The choice of APR was motivated by its wide diffusion due to the mandatory disclosure acts. There have been doubts towards how effectively this measure of loan prices has been understood and used by consumers.

The paper proceeds as follow: section two considers the existing literature and

crystallizes features typical of methods adopted to analyze installment plan selection. Section three introduces a measure of loan economic convenience, whereas section four presents the empirical analysis. In section five results are discussed. Finally, section six summarizes findings and proposes improvements of the study.

## **2. Literature review**

With regards to the comparison between alternatives, much has been written about the purchasing of durable goods. For details, see Beatty and Smith (1987). Unfortunately, the field of financial services has not been explored to any great extent. Consumer credit has received even less attention. The most elaborate investigations have dealt with mortgages. The analyses suggest choice represents the final act of a more articulated process, that usually consists of five phases. The first phase corresponds to the perception of the need to borrow: a new expense or a real estate investment which is not considered as being covered by current endowments. In the second phase, consumers search for information about credit alternatives. In particular, lenders and installment plans are identified. In the next two phases, the data collected is, respectively, contrasted to rate the alternatives (Kamleitner and Kirchler, 2007; Caratelli, 2008).

Consumers (more or less consciously) make use of a repertoire of decision strategies in order to formulate judgements and compare the options available (Bettman *et al.*, 1998). The majority of applications have focused on the comparisons of lenders (Devlin, 2002; Devlin and McKechnie, 2008). Differently, the repertoires applied to select installment plans have been practically unexplored. The little evidence suggests the proposals from two, or a maximum of three, intermediaries are usually examined. Those more active in their research are younger buyers and graduates. The borrowing costs are the feature most often indicated by credit applicants as utilized to select an installment plan. In particular, the Annual Percentage Rate is the term most cited (FSA, 2001; Leece, 1995). The employment of APR should be motivated by its wide diffusion due to the mandatory disclosure acts. Indeed, under many legislative regimes, lenders are required to quote the APR. This metric first was introduced by the United States Congress in 1968 to provide consumers with a standardized measure of loan prices. The new metric may have made comparisons easier. APR was then adopted by the United Kingdom in 1974, and by Italy in 1992. For more details, see Finlay (2009). There have been doubts towards how effectively APR has been understood and used by consumers (Lee and Hogarth, 1999).

Some features characterize methods adopted to analyze installment plan selection. They concern: samples, procedures of interviews, and analyses of responses.

With rare exceptions, samples are composed of few members, and geographically localized. The reason is the explorative nature of the investigations upon loan comparisons (Lino, 1992).

Members of the samples present two profiles. They are students or experienced individuals. Investigations which consider only the first profile are not concerned with the effect of lack of knowledge on choices (Talaga and Buch, 1998).

The data used in the analyses is typically collected by means of questionnaire completed during a face-to-face interview. Questions deal with recollections of past events, behaviors which consumers believe to adopt, and information they judge to be useful in selections. Exercises sometimes support the investigations. They consist of providing consumers with short lists of credit offers asking them to express their preferences. These exercises allow direct evidence of comparisons and reveal abilities with which households apply the declared knowledge (Ranyard *et al.*, 2006).

Responses are usually noted on forms by trained researchers. This practice guarantees data quality (Devlin, 2002).

Descriptive statistics of responses are frequent. In particular, the split-plot analysis of variance is common; this allows the appreciation of factors – especially information availability – which influence choices without recurring to an econometric model (Ranyard and Craig, 1993). The latter is more adapted to larger surveys. Contemporaneously, the analysis of variance is advocated by the absence of an explicit link between consumer

decisions and outcomes (Lee and Hogarth, 2000b). Without a link, performances can be measured at most in terms of choice stability varying the information at disposal. To correct this drawback, the next paragraph admits a measure to estimate the worth of repayment plans.

### **3. Assessment of loan economic convenience**

By financial proposal, one refers to a time series of receipts and expenses. Proposal are said 'financing' when positive cash flows anticipate expenses. A proposal is said to be 'simple' if the time series presents only a single change in sign. A consumer credit is a simple financing proposal: it provides a transfer of money at the beginning of the relationship and its progressive repayment by an amortization schedule.

Proposals are normally subject to assessment of economic convenience, sustainability, and financial flexibility. By economic convenience, one refers to a condition of balance between absorbed resources and those which are generated by the project. Sustainability represents compatibility of proposal cash flows with the profile of receipts and expenses relative to the decision-maker. Flexibility, on the other hand, concerns the risk that the project could alter the leeway to invest or raise funds.

The present analysis concentrates on personal loan economic convenience. The notions of sustainability and financial flexibility – only mentioned here – will be deepened in future developments of this investigation.

Studies of corporate finance have applied economic convenience to financial proposals (in the context of firms). They have produced indicators for measuring the intensity of the relationship between absorbed and generated resources. The Net Present Value (NPV) and the Internal Rate of Return (IRR) are the measures that have obtained the most consensus. The NPV is the sum of the different present values of the project cash flows. The IRR is the (unique) discount rate that sets the NPV equal to zero. Not all proposals are provided with an IRR. Norström's theorem (1972) allows the statement that all simple financing alternatives possess it.

Household finance has taken in these corporate finance indicators extending them to the consumer choices. The most frequent applications have dealt with refinancing decisions, evaluation of lease contracts, and comparison between fixed and adjustable rate mortgages. For further details (describing also difficulties in the translation), see Campbell (2006).

The NPV allows to estimate the worth of financing choices: a negative value points out an excess of absorbed resources; the examined loan must be rejected. Moreover, its calculation enables discrimination between credit alternatives, giving preference to those that present greater NPV.

The limit of NPV resides primarily in the discretionary selection of the return on capital that determines its value. The return on capital is the reward attained by households having a profile similar to the owner of the project; it corresponds to the rate at which consumers are able to generate free cash flows by working and investing. Some authors suggest to adopt the rate of return on an investment account (Storms, 2001). Households have important nontraded assets, notably their human capital. At the same time, they hold illiquid properties, markedly housing. An imperfect correlation between securities, labor income and residence prices advises against accepting financial earnings to estimate the households' return on capital (Bodie *et al.*, 1992). A good alternative could be using the average APR applied by credit providers. A far-sighted lender charges an APR that is not greater than the capacity of the applicant to produce free cash flows; such practice allows to avoid difficulties in debt repayment. Approximating return on capital with the average APR compensates from estimation errors computed by single intermediaries during the credit investigation. Moreover, it sterilizes the influence of commercial policies. Literature uses the term 'opportunity cost of capital' to indicate this discount rate: indeed, it corresponds to the "standard" cost of funding that one gives up when opting for a credit alternative.

The solution adopted in the present work is equating the discount rate with the average annual percentage charges calculated by authorities to identify the usury threshold rates. This procedure is a good compromise between a rigorous esteem of the opportunity cost and the wish of disregarding precepts too complex for practical use by consumers or requiring

information typically unavailable to them. Bank of Italy calculates average rates, which calls 'TEGM' (Tasso Medio Effettivo Globale). These measures correspond to weighted means of all market charges grouped by homogeneous financing products and type of providers. Each charge weighs upon TEGM on the basis of the number of transactions carried out by informer lenders. Consequently, category TEGM is the most probably rate charged to an applicant. By law, it is provided to households with the information leaflets. Personal loan conditions do not compose a separated category. Substantially, charges required by non-bank intermediaries are the unique exception. Appropriately, these are the only intermediaries considered later on, which control the 51% of the Italian market, for an equivalent of 7,6 millions euros financed in the first nine months of the 2008 (ASSOFIN, 2009). For more details on TEGM, see Bank of Italy Instructions ([www.bancaditalia.it](http://www.bancaditalia.it)).

Another limit of the NPV resides in its relative applicability: indeed, it could be employed only to compare proposals homogeneous as regards amounts borrowed and maturities. Consequently, the present investigation contrasts installment plans with an equal magnitude, and substitutes final payments of longer loans with their outstanding balances. This latter practice is common approaching fixed and adjustable rate mortgages, which could differ for lifetime (Templeton *et al.*, 1996).

Interesting links exist between NPV, APR and the opportunity cost of capital, as the formulas cue.

$$\text{Amount borrowed} = \sum_{k=1}^N Mo \times (1 + APR)^{-k}$$

$$\text{NPV} = \text{Amount borrowed} - \sum_{k=1}^h Mo \times (1 + Op)^{-k} - Ou \times (1 + Op)^{-h}$$

Mo = monthly installment

Op = opportunity cost

Ou = outstanding balance at the end of the month *h*

N = lifetime of the loan

h = lifetime of the shortest loan contrasted

The links point out that the ability to select the loan with the highest NPV depends on the awareness of opting for the lowest APR, that is also less than the opportunity cost of capital. The links also reveal that an extension of the repayment period improves the convenience of an identified competitive rate. The first suggestion relies on the capacity of lower APR to disclose the loan with the highest NPV when amount borrowed and maturity are equal between the alternatives. The second precept is based upon the positive effects of a term enlargement on the NPV curve. Extending the repayment period, a competitive financing requires an interests increase less significant than what is expected by the market (depicted by the opportunity cost of capital). The benefits are surely gained when the yield curve is supposed flat. While not always factual, this assumption makes incisive the present analysis. Indeed, it permits to disregard influences of forecast skill on credit choices.

#### 4. Empirical analysis

With the aim of clarifying installment plan selections, a sample of 299 consumers were recruited by word-of-mouth in late 2009: 148 were students of a Faculty of Economics (graduate and undergraduate); 151 were individuals with different profiles, consisting of employed workers (some hired by credit providers), self-employed professionals, and pensioners. Descriptive statistics are presented in Tables 1 and 2.

After a brief introduction to the aims of the study, participants were acquainted with the procedure of interview which was conducted in small groups by means of questionnaire. Questions were posed verbally by trained researchers. They verified responses were correctly noted on forms. Respondents were informed that its completion would take no more than 30 minutes.

The interviews consisted of providing consumers with five series of loan alternatives. For each series, respondents were asked to express their preference justifying the choice. They also had to report difficulties they experienced selecting an option. To point out the effort, participants were equipped with an Osgood Scale question range from 1 (easy task) to 5 (arduous task).

The loan alternatives were represented as rows of a matrix and described through a set of features. Features regarded amount financed, lifetime of repayment agreements, and borrowing costs. To encompass a broad range of opinions, each matrix included options of rejecting proposed loans or being indifferent. Conversely, the alternative “no response” was excluded to force to take a stand.

To assess the effect of information availability on comparisons, four dimensions of borrowing costs were randomly supplied in questionnaires. Participants were classified in three groups according to information available. Group A was provided with the basic information: the monthly installment amount. Contract interest rate and APR were at disposal of groups B and C, whereas total repayments and average charges were only usable by group C.

After the interview, consumers were asked to report their demographic data, education level, and financial experience. Respondents were classified as ‘low’, ‘medium’, or ‘high’ according to their highest level of educational attainment. Low represents no formal qualifications, whereas high concerns attainment of a first degree or higher. Financial maturity was determined according to the measurement introduced by Devlin (2002). Each respondent was asked whether they owned eight distinct types of services: current account, savings account, loans and mortgages, protection policies, administration of securities, investment management, self-directed investing, and life insurance schemes. A financial maturity quotient was then calculated by the sum of the positive responses. The use of plastic cards was also investigated.

**Table 1.** Composition of the sample

Status	A	B	C	Total
Students	47	52	49	148
Graduate	19	24	22	65
Undergraduate	28	28	27	83
Non-students	50	50	51	151
Employed worker	33	37	34	104
Self-employed professional	14	10	8	32
Pensioner	2	1	1	4
Other not working	1	2	8	11
Total	97	102	100	299

**Table 2.** Profile of participants

Characteristic	Prevalent mode (%)			
	Students (148 respondents)		Non-students (151 respondents)	
Age	Less than 25	87.16%	Between 25 and 30	39.74%
Gender	Male	56.08%	Male	52.98%
Marital status	Single	99.32%	Single	60.93%
Region	Lazio	90.54%	Lazio	67.55%
Educational attainment	Medium	55.41%	High	69.54%
Financial maturity	Quotient	0.1950	Quotient	0.3132
Debit card	Availability	67.57%	Availability	96.69%
Credit card	Availability	25.00%	Availability	68.87%

## 5. Results

Results are discussed according to the sequence with which the five questions appeared in questionnaires. Student responses are first investigated; then, preferences expressed are contrasted with those manifested by the rest of the sample. The intent is identifying differences in behaviors adopted by older individuals with greater levels of education and financial maturity (cf. Table 2).

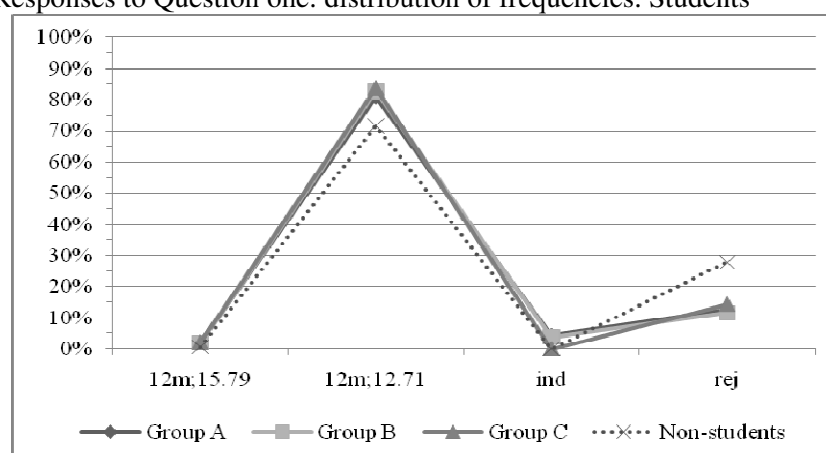
**Question one**

Non-bank intermediary	Amount borrowed	Term	Monthly instalment	Total repayments	CIR	APR	NPV
$\alpha$	10,000	12	901.40	10,816.85	14.75	15.79	-264.34
$\beta$	10,000	12	888.61	10,663.30	12.03	12.71	-119.78

The two credit alternatives presented equal amounts and durations. Students did not experience any particular difficulties in expressing their preferences: 122 individuals (nearly 83%) – out of the 148 students who composed the sample – pointed out the credit option  $\beta$  as their choice. Students were put at ease during the delicate initial phase of the interview. Coherently, they indicated a mean difficulty level of 2.0 for the task – on the graduated scale of 1 (ease effort) to 5 (arduous effort).

To select the option, students seemed to adopt the first comparison criterion introduced in paragraph 3: indeed, they opted for the lowest APR. Their preferences were not affected by information available, as the graph below demonstrates. Moreover, choices were similar to those exhibited by experienced individuals, as the broken line reveals.

**Figure 1.** Responses to Question one: distribution of frequencies. Students



Selection might have been affected by data upon the average annual percentage charges applied by credit providers. Bank of Italy indicated two rates for non-bank intermediaries in the period of the investigation: 10.20% for loans above 6,000 euros; 14% for financings of a smaller amount. In light of such information, the two credit alternatives should have been discarded. Of the 49 students who belonged to the group C and had access to the average data, only 7 declared alternatives to be not economically convenient. This low number suggests a modest regard for market interest rates, or the inability to extract the opportunity cost from the average charges.

Comments noted by students on questionnaires supplied further information upon familiarity with the first criterion. Frequencies with which some keywords appeared in comments were investigated. Citing just the installment amount as the reason behind the selection brings to doubt the correct understanding of the precept. The list of keywords – provided within the appendix – were manually composed reporting the terms cited (cf. Carretta *et al.*, 2009). 101 students were equipped with the APR value. They reported 194 terms to explain their choice (68 referred to borrowing rates). 48 students attributed the decision to interest rate and APR, which were often cited together with installment amount or total repayments. Finally, indications upon the use of APR are evident. However, the support to the selection was anything but confident; the desire to combine APR with other borrowing costs revealed it.

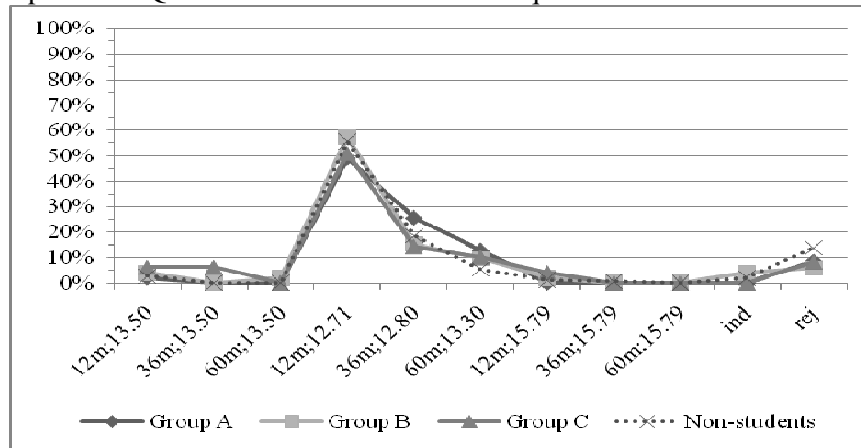
**Question two**

Non-bank intermediary	Amount borrowed	Term	Monthly instalment	Total repayments	CIR	APR	NPV
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$\alpha$	5,000	12	445.95	5,351.45	12.73	13.50	+11.53
$\alpha$	5,000	36	167.82	6,041.56	12.73	13.50	+17.87
$\alpha$	5,000	60	113.08	6,784.58	12.73	13.50	+19.12
$\beta$	5,000	12	444.30	5,331.62	12.02	12.71	+29.81
$\beta$	5,000	36	166.32	5,987.63	12.11	12.80	+42.95
$\beta$	5,000	60	112.62	6,757.33	12.55	13.30	+26.77
$\gamma$	5,000	12	450.70	5,408.44	14.75	15.79	-41.02
$\gamma$	5,000	36	172.12	6,217.81	14.75	15.79	-63.62
$\gamma$	5,000	60	118.30	7,097.79	14.75	15.79	-68.04

The second question examined familiarity with which comparison criteria were adopted in complex decisions. Students had to contrast a significant number of repayment plans. They revealed their effort indicating a mean difficulty score of 2.7. 121 students (82%) appropriately compared the lifetime of the repayment agreements and rejected the alternatives offered by non-bank intermediaries  $\alpha$  and  $\gamma$ . This behavior is consistent with the adoption of the first comparison criterion. The assessment then passed to the “survivors” loans: 78 students selected the option with the short duration; 27 individuals chose the credit repaid in 36 months; whereas 16 respondents opted for the long solution. This distribution of frequencies claims further investigations which could be achieved by analysing questions three and four; these deepened the diffusion of the second comparison criterion.

**Figure 2.** Responses to Question two: distribution of frequencies. Students



**Question three**

Non-bank intermediary	Amount borrowed	Term	Monthly instalment	Total repayments	CIR	APR	NPV
$\epsilon$	3,500	6	600.82	3,604.95	10.21	10.70	+29.30
$\epsilon$	3,500	18	210.54	3,788.65	10.21	10.70	+43.05
$\epsilon$	3,500	42	99.46	4,177.14	10.21	10.70	+46.97

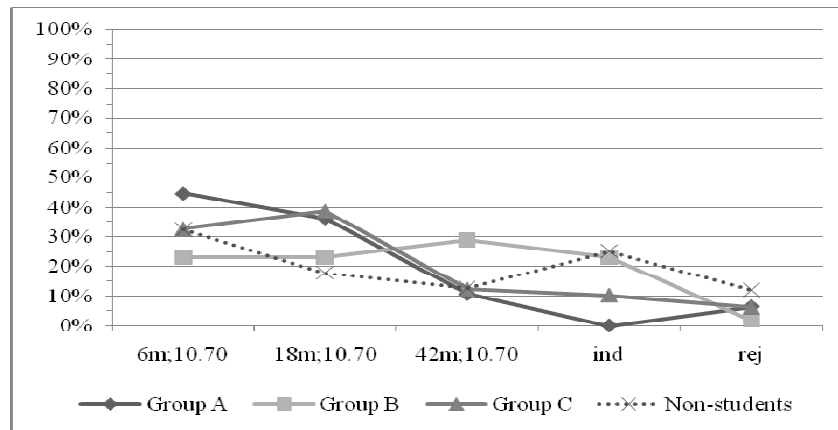
Some uneasiness in evaluation of alternatives with the same APR transpired: the mean level of difficulty assigned by students to the task was 2.3.

If the second comparison criterion had been applied, students would have opted for the long loan. Instead, just 26 individuals selected the credit repaid in 42 months. 49 respondents preferred the alternative with 6 repayments; whereas 48 chose the intermediate solution.

The analysis of keywords confirmed that the second comparison criterion was disregarded: students who opted for the long loan motivated their choice according to an interest in affordable installments. At the same time, only a single explicit reference to average conditions was reported; no hint to the competitiveness of loans was made.

**Figure 3.** Responses to Question three: distribution of frequencies. Students





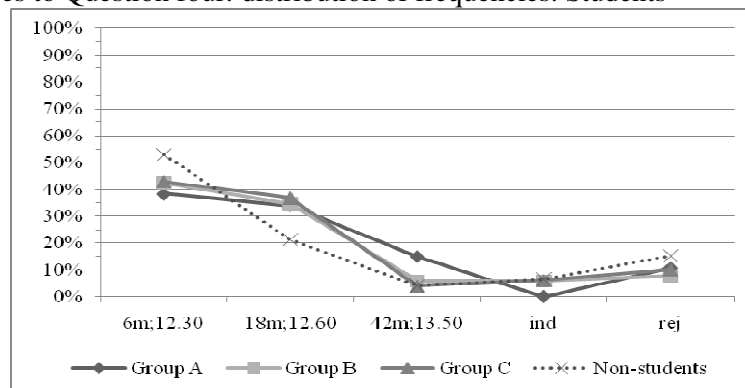
#### Question four

Non-bank intermediary	Amount borrowed	Term	Monthly instalment	Total repayments	CIR	APR	NPV
κ	3,500	6	603.33	3,619.95	11.66	12.30	+15.01
κ	3,500	18	213.32	3,839.70	11.93	12.60	+18.15
κ	3,500	42	103.71	4,355.67	12.73	13.50	+7.05

Trade-offs between interest rates and loan durations were included in this question: the first two alternatives presented almost equivalent APR but different lifetimes, whereas the third solution showed higher APR and duration.

61 students selected the short term. They preferred a marginally lower APR to an extension of the repayment period contravening the second comparison criterion. At the same time, 52 respondents chose the intermediate solution; of these, 29 cited comfortable installments as explanation of their decision. Citing just payments as the reason behind the selection brings doubt towards how effectively borrowing costs have been used. The question posed to participants was quite clear: “Which of these loans do you consider as being the cheapest?”. Indications of an overlap between economic convenience and financial sustainability are, by now, apparent.

**Figure 4.** Responses to Question four: distribution of frequencies. Students



#### Question five

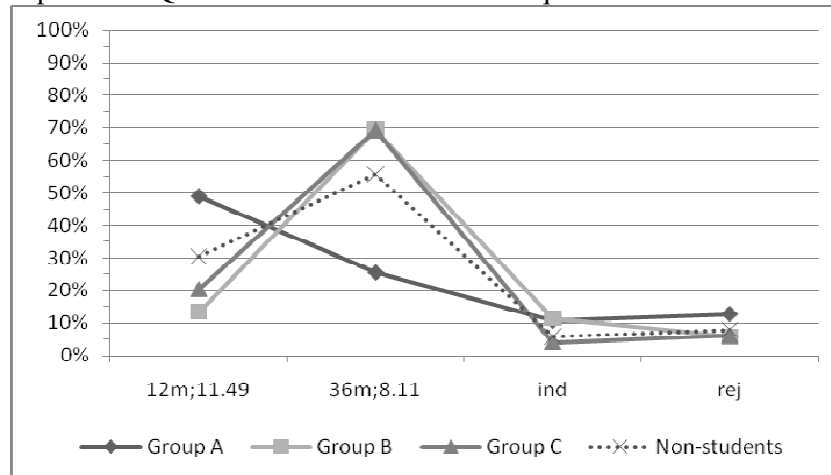
Non-bank intermediary	Amount borrowed	Term	Monthly instalment	Total repayments	CIR	APR	NPV
π	3,500	12	309.21	3,710.58	10.93	11.49	+40.74
π	3,500	36	109.39	3,938.12	7.82	8.11	+149.25

Question five represented an experimental investigation to clarify the role in credit decisions of two key aspects of borrowing costs. Respondents had to choose from a pair of options conflicting in total repayments (TR) and APR: in view of just 200 euros of a greater total cost, the option at 36 months presented a three-fold dilution of the repayment plan due to a well-

lower interest rate. The second comparison criterion advises consumers to prefer the 36 month loan, according to: the lower APR and the protracted repayment period.

Apparently, the combination of low interest rate and long duration influenced participants: 82 students opted for the solution with 36 repayments. Instead, just 26 of these correctly attributed their choice to interest rates. The remaining respondents ascribed their preference to installments which frequently contrasted with TR information. The latter supported the impression that differences in cost were acceptable if compared with a suitable amount of monthly expenses. The analysis of comments therefore suggested a substitute function of total repayments for APR.

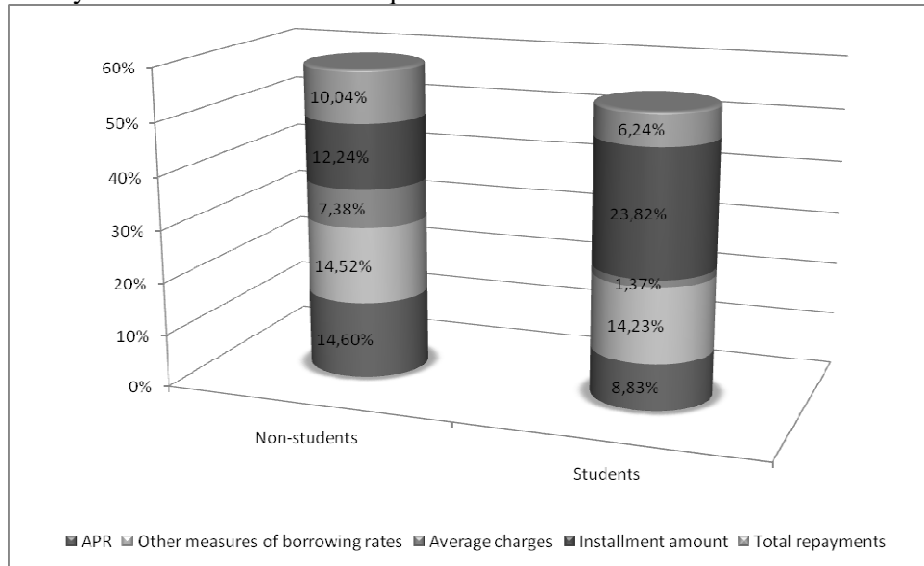
**Figure 5.** Responses to Question five: distribution of frequencies. Students



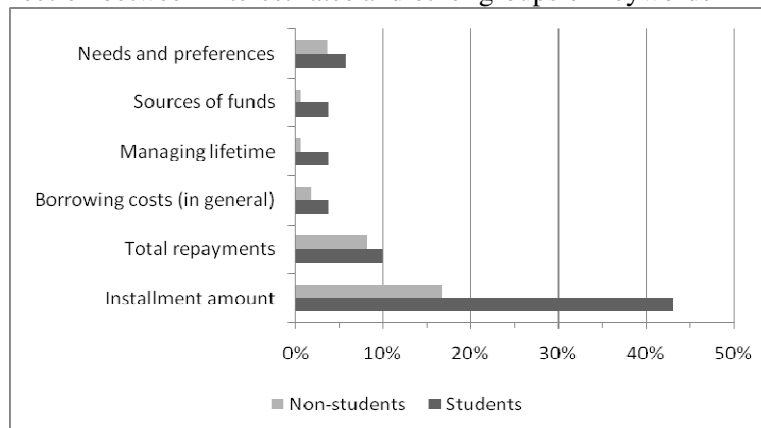
Choices assigned by non-student participants were more polarized: 4 out of 10 preferred the loan with the lowest APR rejecting options when conditions were excessively onerous; 1 opted for a compromise between interest rates and installments. These numbers differ in part from those revealed by the rest of the sample: 2 out of 10 students were only guided by interest rates; 2 opted for loans with low installments; 2 contrasted interest rates and repayments; almost no-one rejected alternatives. Evidently, maturity manifests itself in terms of a more robust awareness of APR, and a strong focus on market conditions. A mean difficulty level of 1.6 attributed to the tasks by non-students supported this opinion when associated with the value of 2.3 exhibited by the remaining participants.

Revealed keywords were consistent with the hypothesis of a greater confidence with APR of non-student consumers (Figure 6). These employed 1,315 words to explain their selections. Of them, 480 (36%) regarded interest rates, against 24% recorded by students. The latter, on the other hand, referred more often to installment amounts (reported 313 times) indicating that much attention was paid to financial sustainability – understandable considering their low level of economic independence. Not only frequencies of cited terms suggested a greater confidence, also their connection: 4 out of 10 students who were affected by interest rates, needed to combine this information with the installments. This number decreased to less than 2 in the rest of the sample (Figure 7).

**Figure 6.** Keywords: distribution of frequencies. Non-students and Students



**Figure 7.** Connection between interest rates and other groups of keywords



Finally, indications upon the diffusion of the first criterion are evident, and concerned both students and non-student participants. At the same time, analyses attested a generalized poor diffusion of the second comparison criterion. This lack of awareness could guide consumers to search for the lowest APR without contrasting lifetimes of repayment agreements. The effect may be the failure to choose installment plans with high NPV.

Monetary effects of selections are given in Table 3. This table was drawn up associating NPV values with answers of the sample. The rejecting options were made equal to zero according to households desire to decline proposals. The average NPV calculated on alternative financings was assigned to the condition of neutrality. This practice is consistent with the absence of a preminent interest in a distinct loan.

**Table 3.** Monetary effect of choices

	Obs.	Mean	Std. Dev.	Min	Max	Groups	Diff. in Mean	P value
Students (Group A)	47	36.70	72.53	-167.35	253.42	Stu (A) - Stu (B)	-51.87	0.018
Students (Group B)	50	88.57	76.01	-139.00	253.42	Stu (B) - Stu (C)	3.95	1.000
Students (Group C)	51	84.62	80.30	-74.40	240.27	Stu (A) - Stu (C)	-47.92	0.004
Non-students (A)	50	50.68	80.19	-119.78	232.24	N-s (A) - N-s (B)	-47.35	0.003
Non-students (B)	50	98.03	73.69	-27.99	233.85	N-s (B) - N-s (C)	-7.93	1.000
Non-students (C)	51	105.96	98.14	-81.44	257.33	N-s (A) - N-s (C)	-55.28	0.008
Questionnaire A	97	43.98	76.54	-167.36	253.42	Qu (A) - Qu (B)	-49.32	0.000
Questionnaire B	100	93.30	74.63	-139.00	253.42	Qu (B) - Qu (C)	-2.20	1.000
Questionnaire C	102	95.51	90.03	-81.44	257.33	Qu (A) - Qu (C)	-51.53	0.000

*Mean* concerns realized earnings in terms of present value. It is evident how group A – who was provided with the narrower information set – made a substantial loss: participants earned an extra amount borrowed of 43.98 euros paying the installments reclaimed on average by the market. If they had been more watchful and qualified, they could have earned up to 257.33 euros. Consequently, they achieved 17% of the maximum NPV reachable. Providing information on CIR and APR created value: percentage of realized earnings arrived at 36% in group B. Interestingly, the addition of further cost items (such as TR and average charges) destroyed NPV for the less mature participants and benefited the higher knowledge group. This finding is consistent with the presence of information overload, according to which little evidence has been offered to present. Probably, a more robust structure of knowledge allowed the mature group to more readily combine new data with their prior belief, improving participants' performance in choosing. Nevertheless, added information gave an advantage to the sample: incremental missed earnings were compensated by extra returns of non-students. Coherently, percentage of realized NPV reached a slightly higher level of 37% in group C. Analysis for differences confirmed the relationships are statistically significant.

## **6. Conclusions**

The role of Annual Percentage Rate in installment plan selection was investigated. The choice of APR was motivated by its wide diffusion due to the mandatory disclosure acts. There have been doubts towards how effectively this measure of loan prices has been understood and used by households.

A sample of 299 consumers were given five series of credit alternatives. For each series, respondents were asked to express their preference justifying the choice. The alternatives were represented as rows of a matrix and described through a set of features. Features regarded amount financed, lifetime of repayment agreements, and borrowing costs.

Providing information on interest rates created value: respondents earned an extra amount borrowed when equipped with APR information. However, they were unable to select loans with high NPV. The reason should be a considerable lack of information about the usage of APR: participants frequently opted for the lowest rate but they neglected to consider the opportunity cost of capital and the extension of the repayment period. Furthermore, they sometimes chose the loan contrasting duration and monthly borrowing costs. The analysis of keywords supported this statement. APR usage may therefore be inapt since employed as a substitute for the monthly installment payment. An overlap between economic convenience and financial sustainability could explain this phenomenon.

If consumers had have been more watchful and qualified, they could have earned much more. Regulators should intervene activating programs of financial education and changes in mandatory disclosure acts. Financial education has to improve the awareness of comparison criteria. Differently, the mandatory disclosure has to verify if further (or different) borrowing cost measures could be placed in credit advertisements. On the other hand, managers should help households make effective credit decisions working on the efficacy of counseling. To improve choices, the latter has to admit the consumer drift to financial sustainability and trade-offs among borrowing costs. Alternatively, households could experience difficulties in combining new data with their prior belief.

Before concluding, a number of limitations of the analysis should be acknowledge. A more detailed interpretation of effects of information availability on comparisons would require: a more complete and representative sample of participants; examination of the extraction processes of the opportunity cost from the average data; an investigation of financial sustainability. These topics could be examined in future works.

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## **Appendix – Keyword list**

### *Amount borrowed:*

Amount borrowed  
Amount financed  
Amount of the loan  
Present Value  
Sum received

### *Interest rate (of the loan):*

Annual Percentage Rate (APR)  
Contract Interest Rate (CIR)  
Internal Rate of Return (IRR)  
Interest rate  
Risk profile

### *Average charges:*

Average charges  
Average rates

### *Duration:*

Deadline  
Duration  
Frequency of payments  
Lifetime  
Number of installments  
Number of repayments  
Period  
Span  
Time

### *Installment amount:*

Amount of installments  
Installment payment  
Monthly cost  
Monthly payment  
Repayment

### *Total repayments:*

Total amount  
Total costs  
Total repayments  
Sum to pay back

### *Borrowing costs (in general):*

Borrowing costs  
Costs of the transaction  
Interests

### *Sources of funds:*

Income  
Liquidity  
Resources  
Salary  
Self-financing  
Wage

### *Needs and preferences:*

Affordable  
Available  
Comfortable  
Flexible  
Needs  
Preferences  
Suitable for me

### *Managing lifetime:*

Extend

Extinguish the debt quickly  
Pay back early  
Thin out  
*Other:*  
Consumer choices  
Investors  
No motivations  
Reinvesting