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How Zero price Affects Demand?: Experimental Evidence from the Moroccan Telecommunication Market

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Abstract

To select one of several products (or to buy nothing) is a daily decision. Its foundations vary from one person to another and are based on perceptions, preferences, and other criteria. The standard theoretical perspective conveys that people choose options with the highest net benefit. However, the zero price model, proposed by Shampanier, Mazar, and Ariely (SMA) (2007), suggests that decisions about free (zero price) products do not simply subtract costs from benefits but instead perceive other gains and costs associated with free products.

This paper tests this second alternative by contrasting demand for telecommunication products in Morocco, mainly SMS and calls. The price difference is maintained between the cheaper and expensive options such that the cheaper product is priced at either a low positive price (cost condition) or zero price (free condition). The results suggest that more participants choose the cheaper option, whereas fewer participants choose the more expensive one. People act as if zero pricing is a special price, as suggested by the zero price model. The paper tests also the affect as an explanation to the zero price effect. The result suggests that the price effect cannot be fully attributed to this dimension.

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Key words: free; zero; price; affect; telecommunications; Morocco.

Introduction

The concept of zero has been used to understand many aspects of decision making. Kahneman and Tversky's (1979) indicate that when it comes to gambles, people perceive zero probability differently than they do for small positive ones. The concept of zero is not perceived differently only in probabilities but in other domains. Shampanier, Mazar, and Ariely (SMA), examine zero pricing as a positively perceived price. It demonstrates that when people are faced with a choice between two products, one of which is free, they overreact to the free product as if zero price means not only a low cost of buying the product, but also its increased valuation.

Nowadays, zero pricing has been increasingly developing in Morocco and related offers have been introduced in many sectors. One good example is the detergent sector in which competitors launch several promotions, offering additional amounts of detergents for free. Brands such as OMO, TIDE and ARIEL offer promotions starting from + 16% to +30% free additional amounts (Online advertising, 2009-2010). Another example of zero pricing in Morocco is from the automotive industry in which Renault offers maintenance and accessories for free (Online Advertising, 2010). In the same context, operators in the telecommunication sector use similar strategies. Via its website, the operator "Meditel" offers its clients the prospect of sending up to 10 SMS/day for free. Similarly, "IAM" offers the same promotion to its customers with the possibility of sending up to 20 SMS/day. Such zero-price offers are mainly devoted to boost sales of products and services. In traditional economics, decreasing prices to zero automatically lead to a huge boost in the sales of free products and services.

Arnold (2010) demonstrates that people tend to buy more products or services that maximize the marginal utility over price (MU/P). Relatively, as the price of a good or service goes down, demand for such product goes up and therefore sales go up. In the same context, Ariely (2008) demonstrates that free options induce higher demand. However, the question that arises is whether such findings can be expanded to other contexts and areas.

The objective of this paper is to investigate whether zero prices and free products lead to higher demand in the context of the Moroccan telecommunication sector. The paper tests also for potential antecedents of this zero price effects.

As such, the current study focuses on the telecommunication sector in Morocco. It does not deal with pricing of telecommunications as this can be found in the seminal papers of Artle and Averous (1973), Rohlfs, J. (1974) and Squire L. (1973). Furthermore, these contributions have been strengthened later by other authors with the increasing number of

competitors in each domestic market of telecommunication (Laffont J.J, Rey P. and Tirole J., 1998; Hausman, A.J, 1997; Peitz, M., 2003; Gruber H. and Verboven F., 2004). But, further papers have been concerned with marketing strategies in the telecommunications sector. These include the contributions of Danaher, P.J., (2002) and of Stremersch, S., and Tellis, G.J., (2002) that have started dealing with pricing of new subscriptions and bundling of services. The first author uses a sample of potential residential customers divided into four groups. The first group is not charged an access fee but has to pay a small per-minute usage. The second group also pays a small usage charge but in addition, has three access price increases over the trial. The third group pays no access fee but has usage charge increases, while the fourth group has both access fee and usage charge increases. Usage levels for each respondent are recorded, as is their month of dropout if they discontinue the services. The data shows that higher access fees result in higher customer attrition, and higher usage cost results in lower usage. Furthermore, usage and retention are related in that declining usage levels over time often signal impending customer attrition. The second author focuses mainly on bundling of telecommunication services and the likely promising marketing strategies.

The current paper looks at the likely bonuses that accompany the on-going telecommunication deals and that are most of the time, provided as free or at zero prices. This practice is becoming pervasive among the telecommunication operators that continuously provide limited or continuous access to series of free services that can be accessed through the phone system and through the Internet.

The paper is composed of four paragraphs. It starts with a literature review. This is followed with the theoretical framework. The empirical analysis and results are then introduced. The last paragraph focuses on the discussion of the attained results.

I. Literature Review

The concept of zero has played a major role in the understanding of several aspects of human behavior and decisions. Festinger and Carlsmith (1959) shows that getting a zero reward is perceived as highly positive compared to receiving a small positive reward. Other literature suggests that changing a reward from something to nothing (or to zero) has a positive impact on people's motivation, self-perception and feelings of competence and control (Deci and Ryan 1985). For instance, Gneezy and Rustichini (2000) suggest that in the case of money collection for charity, performance for the zero reward is much greater than when a small reward is mentioned. Accordingly, Heyman and Ariely (2004) demonstrate that

people use market norms when prices are mentioned, while they apply social norms when prices are not mentioned (zero price).

In traditional economics, "free" implies that there are no additional costs to an individual while transaction is, associated with accrued costs to purchasers. However, the free products represent operating costs for producers or even externalities for society. Hence, every transaction has costs associated with it, and while some consumers may appear to be benefitting from zero prices, someone else is paying these costs. As Milton Friedman (1990) indicates "there is no such thing as free lunch". In this context, Adam Smith conveys, in his book "wealth of nations", that when a voluntary exchange between two parties occurs, it automatically means that both parties are benefiting from it. So, many economic misconceptions and anomalies might be caused by the neglect of these simple insights. Accordingly, free products can be used to achieve a variety of objectives, including test a product, increase marketing awareness and competition.

Revealed preference theory[1], pioneered by Paul Samuelson (1938), is a method by which it is possible to distinguish the best possible option on the basis of consumer behavior. This suggests that the preferences of consumers can be understood via their purchasing habits. While utility maximization is not a controversial theory, the underlying utility functions could not be measured with great certainty. Revealed preference theory brings together with the demand theory via creating means to define utility functions by observing behavior.

Sippel, R. (1997) discusses whether consumer demand satisfies the axioms of revealed preference, and suggests further testing the empirical validity of the neoclassical theory of consumer behavior. The author recognizes that applying the axiom to actual consumer purchase data is difficult, if not impossible, since it poses serious problems of both a methodological and a practical nature. After commenting on the few existing empirical studies in this field, a summary of the results from an experimental approach to revealed preference theory is provided. Data are obtained from a controlled experiment involving real

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[1] A utility function $V(x)$ *rationalizes* the choice x if at the given prices; the chosen level of consumption induces satisfaction that is at least as high as any other available choice. More normally, if prices are given by $tp^i = (p_1^i, p_2^i, ..., p_n^i)$, and if the chosen consumption levels of goods 1, 2, ..., n are $x^i = (x_1^i, x_2^i, ..., x_n^i)$, then $u(x^i) \geq u(x)$ for any consumption level x such that $p^i x^i \geq p^i x$. When x^i is chosen and $p^i x^i \geq p^i x$ so that x is an available choice, it is said hat x^i is *directly revealed preferred* to x. This is written as $x^i R x$. Under these conditions, a variety of situations have been described in the literature of choice.

consumption. The author concludes that most subjects violated the basic axioms of revealed preferences.

This latter direction of theory can be used for a first economic model, or the standard cost-benefit model stating that zero is just another price, so reducing one of the prices to 0 is just like any other price reduction, and hence it should not create any exceptional advantage. The standard cost-benefit model suggests that when faced with selecting between two products (X and Y for example), the customer choose product X if and only if the value of product X is greater than the value of product Y, and the difference between the value and the price of product X is greater than the difference between the value and the price of product Y (as shown in equation 1). Similarly, the customer chooses product Y if and only if the value of product Y is greater than the value of X, and the difference between the value and the price of product Y is greater than the difference between the value and the price of product X (as shown in equation 2). The customers do not choose any product if the prices of both X and Y prices surpass the values of X and Y respectively (as indicated in equation 3).

$$V_X > P_X \quad \text{and} \quad V_X - P_X > V_Y - P_Y \tag{1}$$

$$V_Y > P_Y \quad \text{And} \quad V_Y - P_Y > V_X - P_X \tag{2}$$

$$V_X < P_X \quad \text{And} \quad V_Y < P_Y \tag{3}$$

The cost-benefit model suggests, as well, that even when prices are reduced to zero or to another small price, consumers choose X only if the value of X is greater than the new price of X, and the difference between the value and the price of product X is greater than the difference between the value and the price of product Y (as shown in equation 4). Likewise, customers choose Y only if the value of Y exceeds the new reduced price of Y, and the difference between the value and the price of product Y is greater than and the difference between the value and the price of product X (as shown in equation 5). Finally, customers choose to buy nothing if the prices of X and Y respectively are greater than the values of X and Y (as indicated in equation 6).

$$V_X > P_X - \varepsilon \quad \text{and} \quad V_X - P_X > V_Y - P_Y \tag{4}$$

$$V_Y > P_Y - \varepsilon \quad \text{and} \quad V_Y - P_Y > V_X - P_X \tag{5}$$

$$V_X < P_X - \varepsilon \quad \text{and} \quad V_Y < P_Y - \varepsilon \tag{6}$$

Hence, based on this last model, a reduction of a price to zero will have the same effect of reduction of another price by the same amount while the price is still positive.

Actually, the study of SMA (2007) suggests opposite findings. It demonstrates that under the zero price condition, people dramatically choose the cheaper option (zero price product), which it is not the case for reduced positive prices. Thus people are likely to treat the zero-price as an exceptional price that is associated with higher benefits.

This second model (the zero-price model), suggests that a price of zero is highly attractive. Hence, a price reduction from a positive price to a zero price creates a boost in the attractiveness of the free product and its relative demand. This proposes that zero prices are positively perceived by customers, and hence demand for such a product is higher. The paper tests this hypothesis by contrasting demand for two products across cost and free conditions in the context of the Moroccan telecommunication sector. Under each condition, prices for the products are different such that the cheaper good in the two conditions is priced at either a low positive or a zero price.

Zero pricing might also have a negative effect on demand in some cases. In this context, Ariely et al. (2006) show that students took 4 pieces of Starburst candy when priced at 1¢ per piece, while more students took the candy, but almost no one took more than one piece when priced at zero. Hence, zero prices in this case had negative effect on the demand for the Starburst candy. Indeed, such economic anomalies cannot be explained through traditional economic theory because they are related to individuals' behaviors. One good alternative to understand such behaviors is the use of experimental approach or simply randomized experiments. The main quality of randomized experiments is that they allow the estimation of parameters that would not otherwise be possible to evaluate. The experimental approach allows also close collaboration between researchers and implementers, and hence leads to more efficient results. Randomized experiments are experiments that allow a significant reliability and validity of statistical estimates (Banerjee & Duflo, 2009). Such approach has been widely used recently in development economics and has made valuable contributions in experimental work in economics. Randomized experiments can be a good alternative for multiple cases in which there is a lack of economic data or a lack of causality pattern among variables. One of the main advantages of the experimental approach is that it makes it possible for experimenters to vary one aspect at a time, and so results are more applicable. The experimental approach can be also useful for decision makers in cases where it is challenging to make decisions based on the observational approach or on prior-knowledge. Such approach allows the implementation of multiple experiments at the same time for the same population. In the same context, these experiments allow the

implementation of a dynamic learning in order to build a reliable set of data. They make it possible for researchers to reach an optimal learning, in a way that tests the global effect first then goes into the details of the single components. Randomized experiments are reliable instruments that allow researchers to test theories and strengthen them by strong and sufficient sets of data.

II. Theoretical Model

SMA (2007) suggests that the "zero price" is a special price because it is associated with higher levels of demand for the free product. They suggest also that decisions about free (zero price) products differ, in that people do not simply subtract costs from benefits (as in the cost-benefit analysis), but instead perceive the benefits associated with free products as higher. In order to test this hypothesis, the authors contrast demand for two products across cost conditions and free conditions throughout a set of experiments. The cost condition includes a higher and a cheaper cost such that the cheaper cost is a low positive price. Relatively, the free condition includes similarly two prices, but the cheaper product is priced at zero. The authors propose and test also several psychological antecedents of the effect, including social norms, mapping difficulty, and affect via questionnaires and experiments.

As stated earlier, SMA (2007) starts with two models, one that treats zero as just another price and one that presumes that free options are evaluated more positively by consumers. First, the authors test the validity of the zero price model via mainly, three experiments. Experiment 1 provides the initial evidence of the zero-price model via questionnaires that contradict the cost and free condition for two brands of chocolate. In experiment 2, the authors use a real buying scenario to support the zero-price effect. The results suggest that the effect is not due to decision making based on cost–benefit ratios. Experiment 3 is also a real buying scenario with results suggesting that the zero price effect could not be due to physical transaction costs.

After demonstrating the validity of the zero price model in the first three experiments, the authors propose and examine three psychological mechanisms that might be leading to the effect of zero pricing. These mechanisms include: social norms, mapping difficulty, and affect. The social norms explanation, on the basis of findings (Heyman and Ariely, 2004), suggests that when prices are mentioned, customers use market-based transaction norms for selection of products, whereas social norms are used when prices are not revealed. In order to test for social norms, the authors use negative prices that involve prices but no cost as a third

condition. The results suggest that, in contrast with the social exchange norms explanation, the zero-price effect remains even when money is mentioned in both options in the choice set. The other step is to test for the other two possible explanations: mapping difficulty and affect.

Mapping difficulty proposes that people have difficulty mapping their expected utility into monetary terms. Experiment 4 tests the mapping difficulty explanation via the exchange of a quantity of chocolate by another quantity of chocolate or by nothing (free condition). The results indicate that even when there is no use of monetary terms, people show higher interest in free products. This conveys that the zero price effect is not explained by the mapping difficulty. The last two experiments examine the "Affective" evaluation assumption. The affect explanation suggests that options with no cost invoke a more positive affective response. This affective reaction is used as the basis for decision making before choosing the free option. Experiment 5 includes a questionnaire that evaluates consumers' satisfaction with the four options under the cost and free conditions. The results suggest that subjects experience higher positive affect when facing a free offer compared with the other alternatives. In Experiment 6, SMA (2007) tests whether forcing customers to evaluate the options cognitively, and thereby making these evaluations available and accessible, eliminates the zero-price effect. For this purpose, two samples of questionnaires are used. The first sample controls for the affective valuation via two questions, so that respondents make their choices cognitively. The second sample of questionnaires does not include the above items so that the affect valuation is still present. The results suggest that when respondents have access to available inputs, they make their choices cognitively, and the attractiveness of zero price largely disappears. Based on these results, SMA (2007) proposes that the zero-price effect might be better explained by affective evaluations rather than by the social norms or mapping difficulty.

III. Empirical Methods and Related Results

In order to test whether people are attracted more by free products or zero pricing, this paper measures the reaction to zero prices through a series of experiments. The paper employs a method that contrasts two choice situations (cost and free condition). So, the basic structure of the two first experiments is as follows: All subjects may choose from four options: buy a low-value product (Meditel Call or SMS), buy a higher-value product (IAM call or SMS), buy a medium-value product (INWI call or SMS), or buy "nothing". The variation across conditions that enables us to measure their reaction to the price of zero relies on two basic conditions: "cost" and "free." In the cost condition, the prices of all products are

positive. Under the free condition, all prices are reduced by the same amount, so that the cheaper good becomes free.

All experiments are made on the Moroccan telecommunication sector, mainly on calls and SMS of the three telecom operators: IAM[2], Meditel[3], and WANA[4]. The first two experiments consist of questionnaires about SMS and calls.

III.1: Attractiveness of zero-price

This is conducted through experiments 1 and 2 as described below. The related results are also introduced and discussed.

1. Experiment 1:

109 participants made a theoretical choice among using an SMS service of Itissalat Almaghrib, Meditel, Inwi, or not using the SMS service offered (buying nothing). Across the three conditions, the prices of the SMS decrease by a constant amount (0.20 MAD). In the cost condition, the prices are 0.56 MAD per SMS for IAM, 0.20 MAD per SMS for Meditel, and 0.35 MAD per SMS for INWI. The fourth choice is to not choose any offer and check "nothing". In the free condition, the prices are reduced by 0.20 MAD so that they become 0.36 MAD per SMS for IAM, 0.00 MAD per SMS for Meditel (zero price), and 0.15 MAD per SMS for INWI. An additional condition is mentioned in order to contrast the 0.20 MAD reduction that includes zero price (free condition) to 0.20 MAD reduction that does not include a zero price. This third condition is also a cost condition in which prices are as follows: 0.76 MAD per SMS for IAM, 0.40 MAD per SMS for Meditel, and 0.55 MAD per SMS for INWI. In the three conditions, the option of buying "nothing" is included.

The participants are from both genders (as shown in figure 1 in appendix 1). They have different ages (as shown in figure 2 in appendix 1), and they are students and staff at Al

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[2] Morocco Telecom, or IAM, is the main telecommunications company in Morocco. It was privatized in 2001, and became a subsidiary of Vivendi, which owns 53% share of its capital. IAM is the historical leader in the telecommunications market in Morocco with more than 60% market share in mobile phone sector, and nearly 90% market share in terms of fixed line and Internet sectors (2010).

[3] Meditel obtained the second license of mobile telephony in Morocco in 1999. It began its commercial operations on March 29, 2000. With more than 23 million users (2010), Meditel is the second Moroccan mobile operator. The company offers also 3G internet services in the Moroccan market.

[4] Starting January 1, 2007, INWI, formerly Wana, became the third mobile operator in Morocco. It markets its products and services under the brand Inwi for GSM and 3G internet and under the brand Bayn for fixed for limited mobility telephony. INWI had over 5 million clients in the mobile segment, and more than 2 million clients in the fixed line sector in 2010.

Akhawayn University in Ifrane (as shown in figure 3 in appendix 1). Participants use also different mobile operators (as shown in the table 1).

Table 1: Telecom operators used by respondents (SMS)

SMS Questionnaire		
Respondents Operator	Number of respondents	Percentage from the total
IAM	57	52%
INWI	20	18%
MEDITEL	32	29%
Total	109	100%

As a first step, 20 surveys are distributed to test the applicability and the efficiency of the questionnaires. The first results suggest that the experiment could not be understood by respondents without a detailed explanation by the questionnaire distributors. Hence, the 109 questionnaires distributed later are filled by the distributors through asking questions and explaining the experiment to respondents in order to avoid any misunderstanding of the experiment.

2. Experiment 2:

132 participants made a theoretical choice among using a call from one of the three operators: Itissalat Almaghrib, Meditel, Inwi, or not using the SMS service offered (buying nothing). Across the three conditions, the prices of the calls decreased by a constant amount (0.50 MAD). In the cost condition, the prices are 1.5 MAD a call/minute for IAM, 0.5 MAD a call/min for Meditel, and 1 MAD a call/minute for INWI. The fourth choice is to not choose any offer and check "nothing". In the free condition, the prices are reduced by 0.50 MAD so that the prices become 1 MAD a call/minute for IAM, 0.00 MAD a call/min for Meditel, and 0.5 MAD a call/minute for INWI. An additional condition is added in order to contrast the 0.50 MAD price reduction that does not include a zero price to a 0.50 MAD reduction that includes zero pricing (free condition). In this third cost condition, prices are as follows: 2 MAD a call/minute for IAM, 1 MAD a call/min for Meditel, and 1.5 MAD a call/minute for INWI.

As for the first experiment, the participants are from both genders (as shown in figure 5 in appendix 2). They have different ages (as shown in figure 6 in appendix 2), and they are mainly students and staff at Alakhawayn University in Ifrane (as shown in figure 7 in appendix 1). Participants use different mobile operators as shown in table 2.

Table 2: Telecom operators used by respondents (Calls)

Call questionnaire		
Operator	Number of respondends	Percentage of the total
IAM	95	72%
INWI	8	6%
MEDITEL	29	22%
TOTAL	132	100%

As for the SMS questionnaires, the 132 Call questionnaires distributed were filled by the distributors through asking questions and explaining the experiment to respondents in order to avoid biases in the experiment.

3. Results

These two experiments compare the choices respondents make when the prices for both options are discounted by the same amount and are still positive relative to a case in which both options are discounted by the same amount, yet the cheaper option becomes free (zero-price). These experiments make it possible to examine the reaction to free offers and show both an increase in demand for the cheaper product and a decrease in demand for the more expensive product. Thus, they confirm the hypothesis of the zero price model.

Results of Experiment 1

As indicated in table 3, as the prices decrease from 0.4 MAD per SMS to 0.2 MAD for the SMS of meditel, the demand increases slightly from 47% to 51 %. While, when the price of the Meditel SMS is reduced to a zero price, there is a boost in the demand for Meditel SMS so that it moves from 51% of respondents to 73% (as shown figure 4, appendix 1). For the other operators, even with price reductions, there was a drop in the demand for their SMS (demand for IAM SMS moved from 17% of respondents to 16% and then to 12%, while demand for INWI moves 12% to 11% in the cost conditions, and finally to 8% in the free condition).

Thus, the (hypothetical) behavior of respondents in this paper is consistent with the zero-price model; participants react to the free product (the SMS of Meditel) as if it had additional value.

SMS				
Demands	Offer 1	Offer 2	Offer 3	Standard deviation
IAM	17%	16%	12%	2,80%
inwi	12%	11%	8%	1,91%
meditel	47%	51%	73%	14,22%
NOTHING	24%	22%	6%	9,58%

Results of Experiment 2

As shown in table 4 bellow, as prices are reduced from 1 MAD a call/minute to 0.5MAD a call/min for Meditel, the demand increases very slightly from 57% to 58 %. However, when the price of the call of Meditel decreases to zero, there was a higher increase in the demand for Meditel calls so that it moved from 58% of respondents to 62% (as shown in figure 8, appendix 1). Regarding the other operators, even with price reductions, there was a drop in the demand for INWI calls (demand moved from 9% to 4% as a result of the reduction in the cost conditions, and then it moved to 2% in the free condition). For IAM, there was an increase in the demand as a result of the reduction from the higher to the lower cost condition (demand moves from 27% to 30%), while it stays stable in the free condition (demand stayed at 30%). Thus, the (hypothetical) behavior of respondents is consistent with the zero-price model; participants react to the free product (the call of Meditel) as if it had additional value. Even though, the increase in demand in the free condition for calls is not as significant as in the SMS case (4% increase in demand for the Call free condition, compared to 22% increase in demand as the cheaper prices are reduced to 0).

Table 4: Demand changes across conditions

Calls				
Demands	Offer 1	Offer 2	Offer 3	Standard deviation
IAM	27%	30%	30%	1.58%
INWI	9%	4%	2%	3.58%
MEDITEL	57%	58%	62%	2.73%
Nothing	7%	8%	6%	0.76%

4. Discussion of Results

As shown in figure 9, the results of the questionnaire conducted in SMA (2007) suggest that as they move from cost condition 1 to cost condition 2 via a reduction of 1 cent without including a zero price, there was a slight decrease in the demand for the cheaper product (it moved from 45% to 40%), while there was a stability in the demand for the expensive product (it remained 40%). For the second reduction that includes a zero price (free

condition), the results suggest that there is a boost in the demand for the cheaper product that is priced at zero in the free condition (the demand for the cheaper product moved from 40% in the cost condition to 90% in the free condition). For the expensive product, the demand drops from 40% to 10%, as prices are reduced to reach the free condition.

The results of this paper experiments are to some extent similar to SMA (2007) results. However, moving from the cost condition to the free condition does not have the same effect in both papers. SMA (2007) shows that there is a boost (an increase of 50%) in the demand as the cheaper product was priced at zero, and simultaneously a decline in the demand for the expensive product by about 30%. This is not the case for either of the two experiments in this paper. The results of the SMS questionnaire suggest that as prices move from the cost condition to the free condition, the demand for zero product increases by about 22%. While for the call questionnaire, the demand for the cheaper product increases by just 4%, as the price is reduced to 0. These results suggest that though the higher attitudes toward free options, a considerable portion of respondents choose other options rather than the free products. Such customers might be using other evaluation criteria when making their choices. Such difference between this study and the study SMA (2007) might be also caused by the difference between the testing products used. Choosing a chocolate is a much simpler decision than choosing an SMS or a call, and this might explain the higher attitude toward free options in the study of SMA (2007).

III. 2: Why the zero price is attractive?

After demonstrating that zero price has a major role in consumers cost-benefit analysis and in their decision making relative to product selection, SMA (2007) explores the psychology behind the zero-price effect. It suggests three possible psychological explanations: Social norms, mapping difficulty, and Affect. On the basis of prior research and some additional experiments, SMA (2007) argues that social norms and mapping difficulty do not fully account for the zero price effect. It reveals also that the affect mechanism is a main cause of the zero price effect. The affect account consists of mainly two components. The first is that free offers evoke higher positive affect, and the second is that people use this affect as an input for their decision-making process. In order to test for the affect explanation, the authors mainly use two experiments. The first experiment tests the hypothesis that free offers elicit higher positive effect. In the second experiment, the SMA (2007) eliminates the zero price effect by removing the affect mechanism. To do so, they force people to evaluate the options cognitively and thereby making the evaluations available and accessible.

In order to test whether the affect explanation is really responsible for the zero price effect in the case of the Moroccan Telecom sector, experiments 3, 4, and 5 are conducted to examine whether the affective evaluation is a potential antecedent of the zero price effect. Results and their discussion are introduced below.

1. Experiment 3 (SMS)

50 participants are asked to evaluate how attractive they found an SMS offer at a certain price. The offer is manipulated on four levels among participants: an SMS of INWI for 0 MAD (IN 0), an SMS of INWI for 0.5 (IN 0.5), an SMS of IAM or Meditel for 0.5 MAD (M 0.5), and an SMS of IAM or Meditel for 1 MAD (M 1). Participants are asked to choose their level of satisfaction about each offer on a scale from 1 to 5.

If participants' attitudes toward the offers are based on cost-benefit analysis, the attitudes toward M1 and IN0.5 should be slightly lower than those toward M0.5 and IN0, respectively; and the difference between the attitudes toward IN0.5 and IN0 should be similar to the difference between M1 and M0.5. However, the affect explanation suggests that the attitude toward IN0 should be much higher than that toward any other offer.

2. Experiment 4 (calls)

This questionnaire is quite similar to the questionnaire of experiment 3, except that it deals with "calls" instead of SMS. So, 50 participants are asked to evaluate the attractiveness of a call at a certain price. There are four offers: a call of INWI for 0 MAD/min (IN0), a call of INWI for 0.5 MAD/minute (IN0.5), a call of IAM or Meditel for 0.5 MAD/minute (M0.5), and a call of IAM or Meditel for 1 MAD/minute (M1). Participants are asked to choose their level of satisfaction about each offer on a scale from 1 to 5.

Similarly, if respondents' choices are based on a cost-benefit analysis, the attitudes toward M1 and IN0.5 should be slightly lower than those toward M0.5 and IN0, respectively; and the difference between the attitudes toward IN0.5 and IN0 should be similar to the difference between M1 and M0.5. However, if attitudes are based on the affect explanation, the attitude toward IN0 should be much greater than that toward the other offers.

3. Results and discussion

As shown in figure 10 and figure 11, the results of the two experiments confirm the affect hypothesis, so attitude toward the IN0 offer is higher than attitude toward the other offers. This supports the idea that the zero price offers provoke a larger positive affect than the standard cost–benefit analysis suggests. In fact, when people carefully consider the pros and cons of these offers, they might choose the expensive products even if they are associated with higher prices (Shampanier, Mazar, and Ariely, 2007).

Based on a t-test analysis (as shown in table 5), the results of experiment 3 suggest that the level of satisfaction of IN0 is significantly higher than any other offer (P-value < 0.05 in all cases). Similarly, the results of experiment 4 (as shown in table 6) suggest that even for calls, people have higher attitudes toward IN0. These results convey that zero prices create a positive affective reaction within customers. One explanation to this positive affect is that the decision to take a free product is a much simpler decision. Experiment 5, tests whether this positive affect is used as a cue in decision making when buying products.

Table 5: t--test Output (SMS)

	Observations	Means	Difference of means	T-test	P-value
IN0	50	4.76			
H0: IN0=IN05			0.34	1.80	0.0374
IN05	50	4.42			
IN0	50	4.76	2.7		
H0: IN0=M1				12.98	0.00
M1	50	2.06			
IN0	50	4.76			
H0: IN0=M05			2.96	14.29	0.00
M05	50	1.8			

Table 6: t-test Output (calls)

	Observations	Means	Difference of means	T-test	P-value
IN0	50	4.18			
H0: IN0=IN05			0.64	2.23	0.0140
IN05	50	3.54			
IN0	50	4.18			
H0: IN0=M1			0.96	3.46	0.0004
M1	50	3.22			
IN0	50	4.18			
H0: IN0=M05			0.76	2.82	0.0029
M05	50	3.42			

III. 3: Forced analysis

As mentioned earlier, the affect mechanism is constituted of two parts. The first part is that free offers evoke higher positive affect, and the second is that people use this affect as an input for their decision-making process. In experiment 5, the paper tests whether consumers use this increased affect as a hint for later use in decision making, and so whether it leads to the zero price effect. The results of experiments 3 and 4 show a higher attitude toward the free products than toward any other product. This is consistent with the affect explanation of the zero price effect.

1. **Experiment 5**

Experiment 5 tests whether people use the affect as an input for decision making. To do so, participants are forced to non-affective decisions about the choice of products, so products are evaluated more cognitively. Two hundred participants take part of the experiment, and fill out a questionnaire in which they make a hypothetical choice among calls (100 questionnaires) and SMS (100 questionnaires). For each set of questionnaires, half of the respondents (50 for Call questionnaires; and 50 for SMS questionnaires) are asked three questions before making their choices in order to control for affective evaluations. By doing so, participants are assumed to base their evaluations on cognitively available inputs and therefore they are expected to place lower weight on the affect mechanism. Such non-reliance on the affective evaluation might reduce the zero price effect.

Two sets of questionnaires are filled by two hundred students and staff at Al Akhawayn University in Ifrane. The first set of questionnaires, composed of 100 questionnaires, examines calls in the Moroccan telecommunication sector. Before making their hypothetical choices, half of the participants are asked three questions to control for the affective evaluation of the telecom offers. Participants are asked the following questions: "On a scale from 1 (not at all) to 7 (much more), how much more do you like making a call from INWI compared to making a call from IAM/ Meditel?", "On a scale from 1 (not at all) to 7 (much more) how much more would you hate paying 1 MAD in comparison with paying 0.5 MAD?", and "On a scale from 1 (not at all) to 7 (much more) how much more would you hate paying 0.5 MAD in comparison with paying 0 MAD (nothing)?". Respondents circled a number from 1 to 7. After answering these questions, participants are asked to make hypothetical choice between three choices: INWI (calls are priced at 0.5 MAD/minute, then at 0MAD/ minute), IAM/ Meditel (calls are priced at 1 MAD/minute, then at 0.5 MAD/ minute), or NOTHING. In the other half of the call questionnaires, there is no control of the affective valuation. So participants make their choices directly without answering the controlling questions.

The second set of questionnaires, which is also composed of 100 questionnaires, examines SMS offers in the Moroccan telecommunication sector. Before making their hypothetical choices, half of the participants are asked the same three questions to control for the affective evaluation of the telecom offers. Respondents choose a number from 1 two 7. After answering these questions, participants are asked to make hypothetical choice between three choices: INWI (SMS are priced at 0.5 MAD/minute, then at 0MAD/ minute), IAM/ Meditel (SMS were priced at 1 MAD/minute, then at 0.5 MAD/ minute), or NOTHING. The

other half of the SMS questionnaires does not control for the affective valuation. So participants make their choices directly without answering the controlling questions.

Results and Discussion: Two logistic regressions are performed with the proportions of subjects buying INWI and IAM/ Meditel as the dependent variables and the answers to the three questions as independent variables (forced-analysis conditions only). The results are surprising for both calls and SMS. For calls, as shown in table 7, the results suggest that there is no relationship between choosing INWI and preferring INWI to IAM/ Meditel. Similarly, preferring INWI to IAM is not related to choosing IAM / Meditel. Finally, Disliking paying more (in the two cases 0.5 MAD vs. 1MAD and 0MAD vs. 0.5MAD) is not related to choosing INWI or to choosing IAM/ Meditel offers (P-value=0.105 and 0.084 for the controlling question 2, and P-value=0.458 and 0.783 for the controlling question 3).

For SMS, as shown in table 8, the results suggest also that there is no relationship between choosing INWI and preferring INWI to IAM/ Meditel (P-value = 0.214 for offer 1, and P-value =0.822 for offer 2). The regression analysis shows that disliking paying more (in the two cases 0.5 MAD vs. 1MAD and 0 MAD vs. 0.5 MAD) is not related to choosing INWI or to choosing IAM/ Meditel offers (P-value=0.117 and 0.131 for controlling question 2, and P-value = 0.151 and 0.380 for controlling question 3).

Table 7: Logistic Regression Output (Calls)

CALLS	Offer 1			Offer 2		
	Coefficient	Z	P-Value	Coefficient	Z	P-Value
Controlling Question 1 (INWI vs IAM/Meditel)	0.26	1.56	0.12	0.23	1.66	0.10
Controlling Question 2 (1MAD vs 0,5 MAD)	0.50	1.62	0.11	0.05	0.20	0.08
Controlling Question 3 (0,5 MAD vs 0 MAD)	-0.24	-0.74	0.46	-0.09	-0.27	0.78
Constant	-0.40	-0.18	0.86	1.30	0.79	0.43

SMS	Offer 1			Offer 2		
	Coefficient	Z	P-Value	Coefficient	Z	P-Value
Controlling Question 1 (INWI vs IAM/Meditel)	0.26	1.24	0.21	0.04	0.22	0.82
Controlling Question 2 (1MAD vs 0,5 MAD)	-0.75	-1.57	0.12	-0.56	-1.51	0.13
Controlling Question 3 (0,5 MAD vs 0 MAD)	0.46	1.43	0.15	0.66	2.07	0.38
Constant	2.06	0.82	0.41	0.41	0.18	0.86

The results (as shown in Figure 11 and 12) do not support the basic affect mechanism, according to which the positive affect provoked by the free option drives the zero-price effect, but when people have access to available cognitive inputs, the zero effect disappears and people base their choices on a cost-benefit analysis. These results suggest that for SMS, when controlling for the affective evaluations, the demand for the cheaper products becomes lower in both conditions (cost and free condition). On the contrary, in the case of calls, after controlling for the affective evaluations, the demand for the cheaper products becomes higher in both conditions (cost and free condition).

These results reveal that the higher attitude toward free products could not be fully attributed to the affect mechanism. The results of experiment 5 suggest that there is a difference in the attitudes toward free products between Calls and SMS even when controlling for the affect mechanism. A potential interpretation of these results is that the zero price affect might be explained by other factors rather than the affect mechanism. These factors might include social norms, mapping difficulty, or others. Another interpretation is that customers' choices in the telecommunication sector are highly related to how telecom operators are perceived. So the decision to choose one operator is not as simple as choosing a chocolate as in the case of SMA (2007). This might explain the differences in results between this study and the study of SMA (2007). Finally, when controlling for the affect mechanism, there is an upward movement in the demand for cheaper products in the case of calls, while the demand for cheaper products declines as prices go down in the case of SMS. These results might be explained by the fact that customers might use a cost-benefit analysis in the selection of products, after controlling for affect. So, even when the SMS of INWI becomes for free, the demand for the free SMS decreases by the same amount by which the demand for the cheaper positive SMS decreased, which is not consistent with the zero price effect assumption. This

suggests that customers use different criteria to analyze different products, so the zero price model might have been used for chocolate while the cost-benefit analysis might be used in the selection process of SMS and Calls.

IV. Overall Discussion and Conclusion:

This paper starts with two models, a cost-benefit analysis model that treats zero just as another price and the zero price effect model which presumes that free options are evaluated more positively. In order to distinguish between these two approaches, experiments 1 and 2 test for the zero price model. The results provide evidence of the validity of the zero price model as demand for zero price products is relatively higher. However, these results are somewhat different than the results of SMA (2007). SMA (2007) shows that there is a boost (an increase of 50%) in the demand as the cheaper product is priced at zero, and simultaneously a decline in the demand for the expensive product by about 30%. Nevertheless, this is not the case in the first two experiments in this paper. The results suggest that demand for the zero product increase by 22% for SMS, and just 4% for calls, as prices are reduced to zero. Therefore, even with the higher attitudes toward free options, a considerable portion of respondents choose other options rather than the zero price products. Such customers might be using other evaluation criteria when making their choices. Another potential explanation for these results is the difference between the testing products used. Choosing a chocolate is a much simple decision than choosing an SMS or a call, and this might explain the higher attitude toward free options in the study of SMA (2007).

After demonstrating the exceptional properties of zero pricing, the paper examined a possible psychological cause for the zero price effect, which is the affect mechanism. SMA (2007) demonstrates that the zero-price effect might be better accounted for by affective evaluations than by social norms or mapping difficulty. So this paper tests for the affective evaluation as an explanation of the zero price effect. The affect mechanism consists of two parts. The first part suggests that free offers evoke higher positive affect, and the second conveys that people use this affect as an input for their decision-making process. In experiment 3 and 4, the paper tests for the higher positive affect evoked by free products. The results suggest that zero prices induce higher positive affect within customers. Experiment 5 tests whether this positive affect is used by respondents as a cue to their decisions when selecting products. The results of experiment 5 do not support the affective evaluation hypothesis. Therefore, the zero price effect is not mainly attributed to the affective evaluation as suggested by SMA (2007). These results might be explained by the fact that customers

might use a cost-benefit analysis in the selection of products, after controlling for affect. So, even when the SMS of INWI became for free, the demand for these products decreased by the same amount in which the demand for the cheaper positive SMS decreased, which is not consistent with the zero price effect hypothesis. This suggests that customers use different criteria to analyze different products, so the zero price model might be used in buying chocolate while cost-benefit analysis can be used for SMS and Calls. Decisions about telecom operators might be associated with different perceptions and preferences. A final explanation of these results is that other factors might account for the zero-price effect including mapping difficulty, social norms, inferences about quality, and so on.

The results of this paper suggest that zero prices lead to higher demand within free products. These results suggest also that the zero price affect cannot be attributed to affective evaluation. This work is still exposed to some limitations such as cultural biases and the applicability of these results to other sectors. Therefore, the zero-price model remains a complex model, and much additional work is needed to understand the complexities of this model in the marketplace.

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Figure 1

Gender of respondants
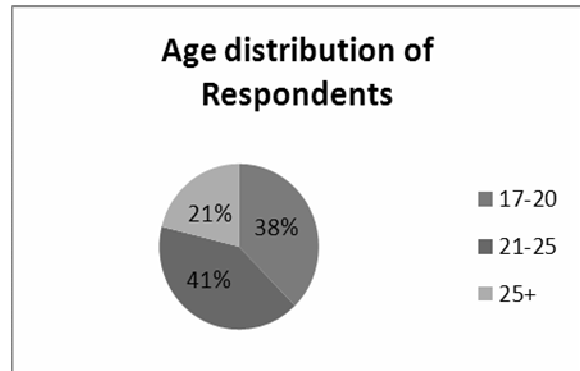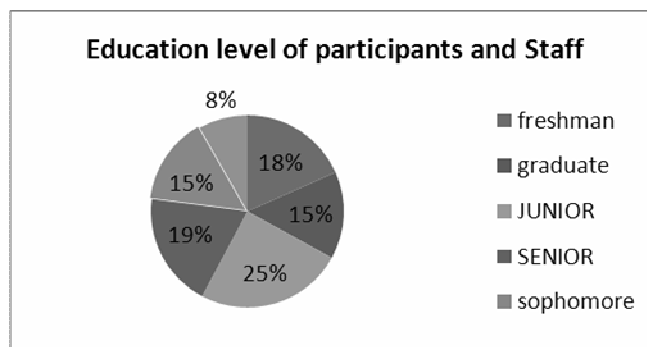
37%

63%

- Female
- male

Figure 2

Age distribution of Respondents

21% 38%

41%

- 17-20
- 21-25
- 25+

Figure 3

Education level of participants and Staff

8%

18%

15%

15%

19%

25%

- freshman
- graduate
- JUNIOR
- SENIOR
- sophomore
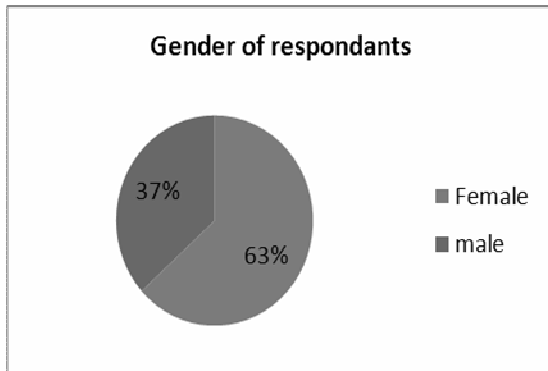
Figure 4: SMS Questionnaire results

80%
73%
70%
60%
51%
50%   47%
40%
30%   24%
20%   17%   16%   22%
      12%   11% 12%
10%   8% 6%
0%
Cost Condition 1   Cost Condition 2   Free Condition
(0.76 & 0.4 &   (0.56 & 0.2 &   (0.36 & 0 & 0.15
0.55 MAD)   0.35 MAD)   MAD)

- IAM
- INWI
- MEDITEL
- NOTHING
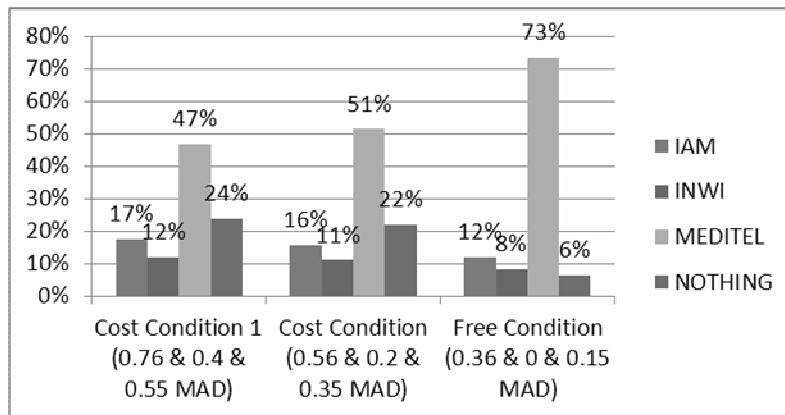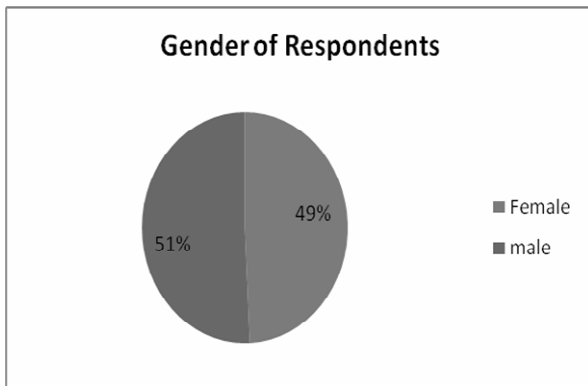
Figure 5   *Figure 6*
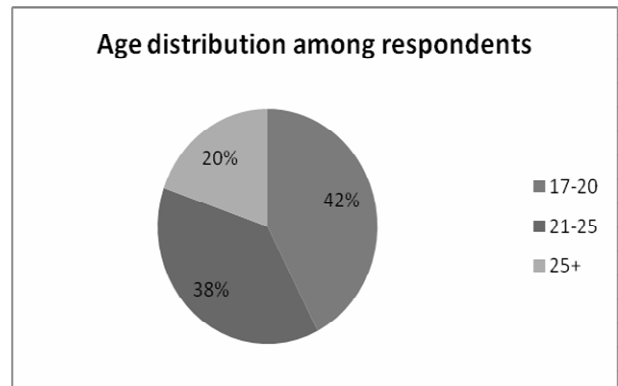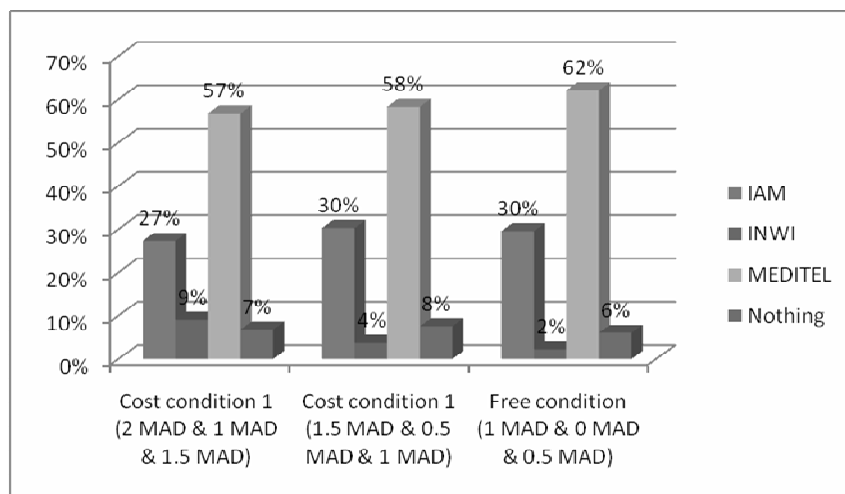

Figure 7: Call Questionnaire results

Figure 8

Proportions of Consumers Choosing Hershey's and Ferrero Rocher Chocolate Across the Three Experimental Conditions in Experiment 1
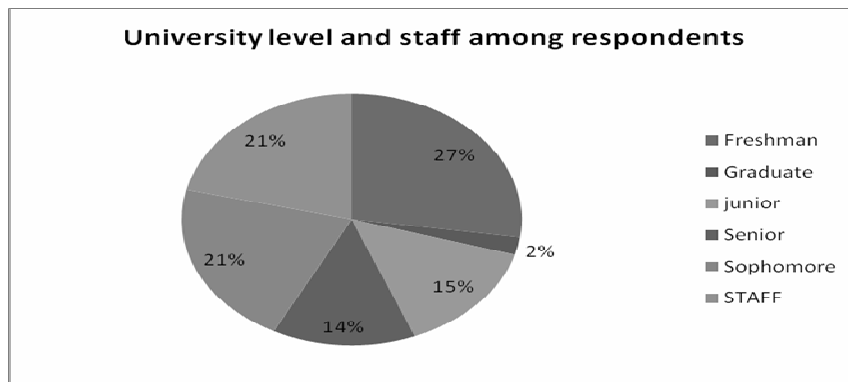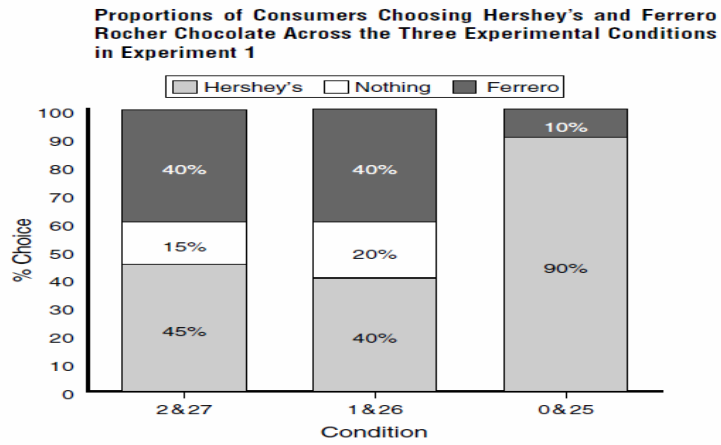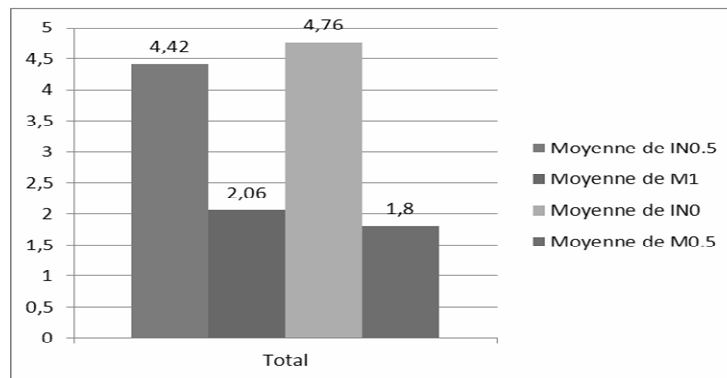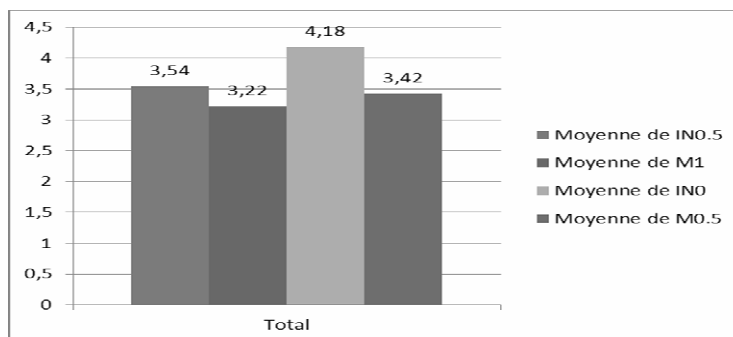
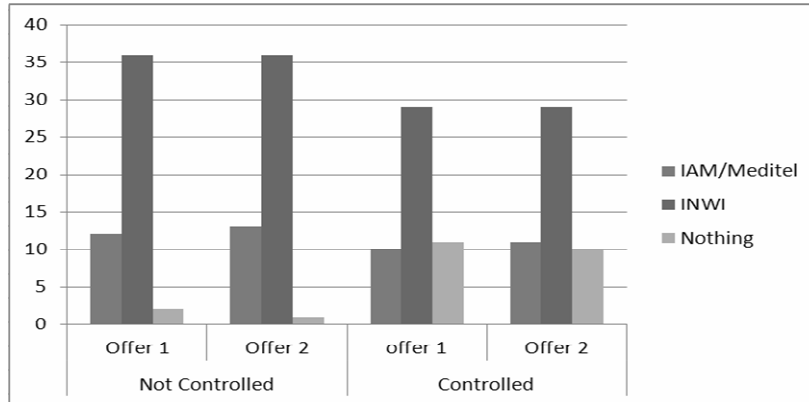*Figure 10: Experiment 3 results*

Figure 11: Experiment 4 results

Figure 12: Experiment 5

SMS results

Calls Results