Is Credit Associated with a Higher Quality of Life? A Capability Approach

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Abstract

There has been an increasing amount of research going beyond income-based approaches to social and economic development. Drawing closely on Sen's capability approach to welfare economics, this paper investigates whether the access to, and use of, informal and formal credit is associated with a higher quality of life amongst the poor in Hong Kong. Specifically, a new survey is constructed, reflecting key theoretical concepts from Sen and Nussbaum's framework and regression models are used to estimate relationships between life quality and financial services. Key empirical findings of the paper include the existence of the unhappy borrower, the lower level of capability that borrowers have at home relative to those that do not borrow money and how credit is used has an affect on objective wellbeing.

Keywords credit; wellbeing; capabilities; personal finance; inequality and Hong Kong.

1. Introduction

In 2006, Muhammad Yunus and Grameen Bank were jointly awarded the Nobel Peace Prize "for their efforts through microcredit to create economic and social development from below". Increasing individuals' access to formal credit, was viewed as having transformational affects on the World's poor. The empirical evidence supporting the microcredit miracle was largely based on the influential paper by Pitt and Khandker (1998, pp. 958-996), which showed substantial effects on individual consumption from formal credit interventions. This evidence has, however, been questioned amongst others by Roodman and Morduch (2009, p. 41) who not only criticized the statistical methods used, but in a replication of the original studies, generated results which were at odds with Pitt and Khandker's 1998 work.[1]

Probably as a result of the continued discourse in the literature regarding the stand-alone effects of formal credit interventions, the debate has widened (see Odell, 2015, p.5), increasingly focused on how the access to and use of personal financial services (including savings, insurance, credit and payment systems) impact individual aggregates such as consumption, savings and investment, as well as select social outcomes. It is also fair to say that the evaluation of formal credit treatments in the literature has largely been seen through the lens of income-based measures. Simply put, the protagonists have argued that improved access to formal credit allowed capital constrained individuals to become entrepreneurs or take riskier jobs, sustainably expanding their income and escape from poverty. There was, however, an implicit assumption in many of these studies that borrowers actually used these loans for investment purposes. In fact, and as Karlan, Osman and Zinman (2013, p. 14) observe, borrowers frequently often using credit for non-business purposes, even though their loan applications said otherwise.

If, as we maintain here, the main purpose of economic activity is the production of human wellbeing, then measuring economic activity through income-based indicators, is unlikely to fully capture the benefits of economic progress for quality of life and human development purposes. Sen (1999, p. 86), for example, has pointed out that income itself should not be a goal in its own right, as income is merely instrumental in achieving what is intrinsically important to humans, namely wellbeing or in Senian terms what people actually do and what they are able to do. As a result, in evaluating whether credit treatments lead to an improvement in quality of life, it is necessary, to go beyond GDP and measure progress in terms of the outcomes for human wellbeing. We also suggest here that credit interventions should be evaluated both in terms of an individual's access to and use of both formal *and* informal credit. The assumption that individuals were credit constrained was likely an oversimplification, given the potential to borrow from family and friends and not just from formal banking channels (Karaivanov and Kessler, 2016, pp. 1-3).

Specifically, in order to investigate whether the access to and use of informal and formal credit is associated with a higher quality of life amongst the

[1] More recently, a series of randomized studies (Angelucci et al 2015, pp. 151-182; Crepon et al 2015, pp. 123-150; Augsburg et al 2015, pp. 202-203; Attanasio et al 2015, pp. 90-122; Tarozzi et al 2015, pp. 54-89; Banerjee et al 2015, pp. 51-52) have generated substantial evidence suggesting that on average there were in fact no transformative socio-economic effects.

poor in Hong Kong, a new survey is constructed, reflecting key theoretical concepts of the capability approach. We use this survey instrument to collect data from a poor neighborhood in Hong Kong, operationalizing Sen's framework in a novel way. Specifically, we conduct a number of analyses and note three key findings: (i) borrowers in our sample have lower capabilities at home than non-borrowers and importantly, informal borrowers have lower capabilities at home than formal borrowers. *This is important given most borrowers in Hong Kong use informal sources*; (ii) borrowers are less happy than non-borrowers according to the self-reports from our sample, and (iii) the way in which credit is used may have an effect on individual objective wellbeing, and the concept of 'good debt' and 'bad debt'. Beyond this, and more generally, the paper seeks to demonstrate that Sen's capability approach can be a useful framework for evaluating the efficacy of credit interventions, as it has a wider *informational base* than approaches based solely on income and allows researchers to assess how credit policy initiatives might affect a range of life quality outcomes directly, and not just through the slightly less direct lens of income.

2. Theoretical Framework

The capability approach, which emerged during the 1980's and 1990's, did so due to concerns regarding the informational base of traditional welfare economics. The Benthamite form of utilitarianism, which focused on maximizing aggregate utility in society was criticized by Sen (1999, pp. 62-63) as being distributionally indifferent and neglecting the rights and freedoms of individuals. Accordingly, this paper introduces a framework and some notation for evaluating human wellbeing based on Sen's principal equations (Sen, 1985, pp. 7-9).

There are three core concepts of human wellbeing in this theoretical approach, which are grouped into objective and subjective measures of wellbeing. Objective wellbeing comprises both (i) the beings and doings that a person actually achieves, known as functionings and (ii) the opportunities that an individual has to achieve various being and doings, which are understood as capabilities, whilst a person's functionings, and perhaps even sometimes capabilities not realized, are to different degrees mediated by phenomena such as adaptation, reflected in subjective wellbeing. (This latter point is sometimes misunderstood as suggesting Sen does not believe in subjective wellbeing or happiness but that is far from the case. Rather his key insight is that because people do adapt, subjective wellbeing cannot be viewed as a gold standard metric of value). In turn, these capabilities and functionings of an individual are a function of the resources and personal characteristics with which that individual is endowed.

Borrowers, i, are defined in our study as individuals who chose to borrow money, formally or informally, in the last twelve months, whereas non-borrowers, j, are individuals that had the ability to borrow money, but chose not to. These two social groups each possess a set of resources X_i and Y_j from which i or j can choose a vector of resources, x_i or y_j, which i or j can convert by function, $c(\cdot)$, into a vector of characteristics of those selected resources. Individuals i and j also have a set of conversion functions or personal characteristics, F_i and G_j from which i or j can select a conversion function, $f_i(\cdot)$ and $g_j(\cdot)$, reflecting one

pattern of use of the vector of resources that *i* and *j* have available. If individuals *i* and *j* choose conversion function, $f_i(\cdot)$ and $g_j(\cdot)$, then with *i* or *j's* vector of resources, the achieved functionings are given by vectors b_i and l_j respectively:

$$b_i = f_i\left(c\left(x_i\right)\right) \tag{1}$$

$$l_j = g_j\left(c\left(y_j\right)\right) \tag{2}$$

The set of resources X_i, from which *i* can choose a vector of resources x_i, comprises goods and services, and credit ($X_i = \{g_i, s_i, cr_i\}$). Likewise the set of resources Y_j, from which *j* can choose a vector of resources y_j, also includes goods, services and credit, ($Y_j = \{g_j, s_j, cr_j\}$). However, despite having credit in his or her resource set, *j* decides to choose a vector of resources comprising only goods and services.

It is therefore presumed that *i* has access to a greater set of conversion functions, F_i, than that set, G_j, available to *j*, as a result of *i* choosing to be a borrower and using credit. It is also assumed that choosing to borrow money allows *i* to convert resources in ways that non-borrowers cannot. Accordingly, the possible functionings b_i that individual *i* can achieve are greater than *j*. This set of possible functionings for individuals *i* and *j*, is akin to Sen's concept of capability, given by sets Q_i, and W_j:

$$Q_i\ (X_i) = [b_i | b_i = f_i(c(x_i), \text{for } f_i(.) \in F_i \text{ and } x_i \in X_i] \tag{3}$$

$$W_j\ (Y_j) = [l_j | l_j = g_j(c(y_j), \text{for } g_j(.) \in G_j \text{ and } y_j \in Y_j] \tag{4}$$

For individuals *i* and *j*, utility is then defined as the happiness derived from their doing or beings:

$$\mu_i = h_i\left(f_i\left(c\left(x_i\right)\right)\right) \tag{5}$$

$$\delta_j = n_j\left(g_j\left(c\left(y_j\right)\right)\right) \tag{6}$$

Individual *i*, through happiness function h_i, can achieve higher levels of utility *ceteris paribus* than individual *j*, given *i's* greater number of conversion functions and accordingly the larger number of possible functionings he or she can achieve.

Likewise, individual *i's* capability set is greater than individual *j's*, $Q_i > W_j$. By combining the relations for individuals *i* and *j* in (5) and (3) and (6) and (4), respectively, it can be seen that experience should theoretically depend on what people are able to do, and so experiential utility can be modeled as a function of the capability set, *i* or *j* has :

$$t_i = k_i(Q_i) \tag{7}$$

$$\gamma_j = d_j(W_j) \tag{8}$$

k_i (·) and d_j (·), are the functions converting the capability, *i* or *j* has into higher levels of experiential utility. It is a similar function to the happiness functions in equations (5) and (6). In this paper, we report on an exercise that collects data in line with these concepts.

3. Data

The dataset generated in this paper is designed to implement the theoretical framework described above. A survey instrument was constructed to operationalize relevant concepts from the theoretical framework, which was in turn given to 300 lower and middle class individuals living in a poor district of Hong Kong. A middle class individual is defined as somebody belonging to a household, which has a household monthly income of Hong Kong Dollars 17,000 or less (approximately United States Dollars 2,200), the median income in the poor district of Hong Kong under investigation. As the survey was intended to compare objective and subjective wellbeing between borrowers and non-borrowers, data was collected on a range of indicators discussed below in this section. Non-borrowers are defined as individuals who borrowed less than HKD 2,500 in the previous twelve months: this threshold was set based on a focus group held in Hong Kong.

Experiential Utility

Following Kahneman and Deaton (2010, p. 16489), data was collected on subjective wellbeing / experiential utility, distinguishing between questions on life evaluation, which refer to an individual's thoughts about his or her life and happiness, non-happiness and stress, which are concerned with the emotional quality of an individual's everyday experience. Different measures of experiential utility respond differently to external changes so multiple indicators are used. Specifically, this paper uses a question on life evaluation, as opposed to life satisfaction, which has been more prevalent in the literature, as Kahneman and Deaton (2010, p. 16492) argue that the life evaluation question, which uses Cantrill's Ladder of Life, is a purer measure of life evaluation than the life satisfaction question, which has an emotional aspect.

In order to measure Sen's concept of advantage, a further question is included, which is unique in the literature: 'Overall taking account of the opportunities and constraints to do things that you value, how would you rate the things you are able to do?' We believe this question is a more direct indicator of the subjective value of the opportunities an individual has, relative to others, at least compared with Cantril's Ladder, which is often used to provide an overall life quality assessment.

There are however limitations to using experiential utility and subjective indicators as measures for policy purposes. The first as Dolan and White (2007, pp. 72-73) note relates to the "happy slave" and the tendency of individuals to habituate to changes in living conditions while the second, is that people's aspirations change in line with their objective circumstances. However, these concerns caution against failing to take account of the context, background and methodology of subjective indicators rather than questioning the importance of personal assessments. It should also be recognized that objective indicators can

have serious limitations: national income changes, for example, are often small compared to the statistical error with which they are measured; national income comparisons without corrections for purchasing power parity can be highly misleading and yet the corrections can be difficult to make; income figures for the self-employed based on tax records are difficult to compare with counterpart records for the employed, and so on. For these reasons, it is taken that both kinds of assessments are needed but that both merit scrutiny to check whether the proposed use or interpretation is acceptable given the nature of the measures being used.

Functionings (Activities and States)

Data was collected on 27 indicators of the functionings, or the doings or beings of individuals. Questions were asked based on activity involvement yesterday and whether yesterday was a normal working day. The coverage is similar to that used by White and Dolan (2009, pp. 1000 – 1007); the frequency and form – focusing on activity involvement yesterday (yes or no) was based on the premise that this is likely memorable without the use of diaries.

Capabilities (Advantage)

Questions were asked across six sub-domains regarding what an individual is able to do at home and work. A key consideration in constructing this list, given its relatively abstract nature, was that the questions be easy to understand by the respondent. The dimensions of capability covered are related to objective lists of human success and more particularly, a widely discussed list produced by the philosopher Martha Nussbaum (2000, pp. 70-85). Further, the dimensions identified draw on a survey of such indicators of capabilities, proposed by some 40 such lists and a consultation exercise conducted by the Office for National Statistics (2012) with some 30,000 members of the UK general public. Regarding Sen's concept of advantage, respondents were asked to indicate their response to our survey question, based on an eleven point Cantrill Ladder.

Credit and Socio-Economic Variables

A suite of 23 indicators was then developed, based on a review of the literature, related to the access to and use of credit. A key consideration in constructing these indicators was to reflect theoretical concepts, such as the information asymmetries that lenders face in extending credit (Armendáriz de Aghion and Morduch, 2010, p. 467), as well as finding out what individuals value when accessing and using credit (see Jones, 1999, pp. 1- 47; Buckland, 2012, pp. 100-119). In addition, the survey includes 14 socio- economic variables covering indicators including education level, age, marital status and race, which are often found in quality of life models.

Type of Data and Regression Models

An important assumption in linear regressions estimated by ordinary least squares, is that the dependent variable is both continuous and cardinal. However, the data collected on measures of experiential utility, advantage and capabilities at home and work, which are dependent variables in the empirical models to follow, are ordinal in nature, given the eleven-point Likert scales used.

Data collected on the functionings that individuals achieved yesterday had a binary response - '1' if the functioning was completed and '0' otherwise. The data collected on functionings is also used as a dependent variable in some of the empirical models, so should be estimated using a logistic regression. However, as noted below, due to convergence failure reasons, it was not possible to estimate the parameters in the models using logistic regressions and instead an index of functioning involvement yesterday was constructed, allowing the use of OLS models instead.

Indices

Key variables in our analysis include the functionings, capabilities and experiential utility of borrowers and non-borrowers. Summary capability indices were created related to individual *i* and *j*'s capabilities, with respect to home and work, by summing over the data collected in the six sub-domain indicators for home and work-related capabilities. This implies equal weighting and can be justified on the basis of insufficient reason.

To address the statistical problems of using binary variables as dependent variables in models estimated by ordinary least squares and issues of convergence failure associated with logistic regressions, a summary functioning index was constructed by summing over the data collected across the 27 sub-domain indicators of the beings and doings achieved by individuals *i* and *j* yesterday. Such an index has the benefit of being ordinal although it assumes that all activity involvement can be interpreted as a good. This might be reasonable if activity is freely chosen rather than the subject of coercion, however some activity involvement could be a response to negative events in a life (praying for example) which would make predictions about relations between the functioning index and subjective wellbeing, potentially, less clear cut. However, for the most part it is believed, nonetheless, that most activities in this index can be taken to be interpreted as positive things that people do.

4. Methods (Models Estimated)

The empirical models estimated are all related to the theoretical framework, described above. A key aim of the models is to shed light on the existence and signs of relations between borrowing status and a variety of life quality indicators, which is done using both pooled and non-pooled data. Coefficients of sub- sample models facilitate comparisons and understanding whilst pooled models allow for more efficient coefficients to be estimated in which differences between groups can be reflected in the significance of terms that capture interactions between borrowing status and other predictors. A further limitation of using the two sub-samples approach, is the "curse of dimensionality", given

the large number of predictors in each sub-sample, and accordingly the difficulty in obtaining statistically significant results between the two sub-samples (Dash and Kajiji, 2008, p. 213). All models estimated are variants of the following equations, with equations (10) and (11) nested within equation (9). The following illustrates the framework in the context of an empirical model used for the production of the functionings index:

$$F_{ki} = \alpha + \beta_1 C_{1i} + \cdots + \beta_{48} C_{48i} + \gamma D_i + \cdots + \delta_1 (C_{1i} D_i)_{1i} + \delta_{48} (C_{48} D_i)_{48i} + \varepsilon_i \quad (9)$$

If $D_i = 0$, the individual is a non-borrower, then equation (9) is reduced to:

$$F_{ki} = \alpha + \beta_1 C_{1i} + \cdots + \beta_{48} C_{48i} + \varepsilon_i \quad (10)$$

Whereas if $D_i = 1$, the individual is a borrower, then equation (9) reduces to:

$$F_{ki} = (\alpha + \gamma) + (\beta_1 + \delta_1) C_{1i} + \cdots + (\beta_{48} + \delta_{48}) C_{48i} + \varepsilon_i \quad (11)$$

where F_{ki} is the functionings index, C_{1i} represents one of the 48 credit-related and socio-economic predictors, D_i the dummy variable of whether the individual is a borrower or not and $(C_{1i}D_i)_{1i}$ signifies the interaction between borrowing status and each of the 48 predictors. Equation (9) was run for the pooled sample, with a variation were controls were added for income and gender. A backward elimination process was applied to equation (9) such that all remaining variables were significant at the 10% level; accordingly there is a statistical link between these predictors and the dependent variable. Significant predictors and interaction variables were taken from equation (9) and the model saturated, in order to eliminate bias before running one further iteration in order to determine the significance of all remaining predictors.

Separate models, (equations (10) and (11)) were then run for borrowers and non-borrowers, from the saturated model of equation (9). As a result there is agreement between the non-borrower coefficients of models (10), (11) and model (9), which they are nested in, and t-tests can be run on the coefficients of the predictors for significance. The null hypothesis for the interaction terms in the pooled model (equation 9) is that there is no difference in the value of the predictor coefficients between borrowers and non-borrowers; rejection of the null hypothesis would confirm a statistically significant difference. For the split sample models, the null hypothesis is that the coefficients of the predictors are equal to zero for equations (10) and (11); a rejection of the null hypothesis would imply significant coefficients for non-borrowers and borrowers respectively.

Separate models, of the same form as equations (9), (10) and (11), were then run for each of home and work capabilities regressed against credit-related and socio-economic covariates, and each dimension of experiential utility regressed against the summary functionings index and in a separate regression, home and work capabilities indices, together with usual predictors found in quality of life models. Independent samples t-tests were performed on the descriptive statistics for both borrowers and non-borrowers, with the null hypothesis being that there is no difference in the mean scores of borrowers and non-borrowers. Such tests allow for statistical comparisons between borrowers

and non-borrowers in functionings, capabilities at home and at work and experiential utility.

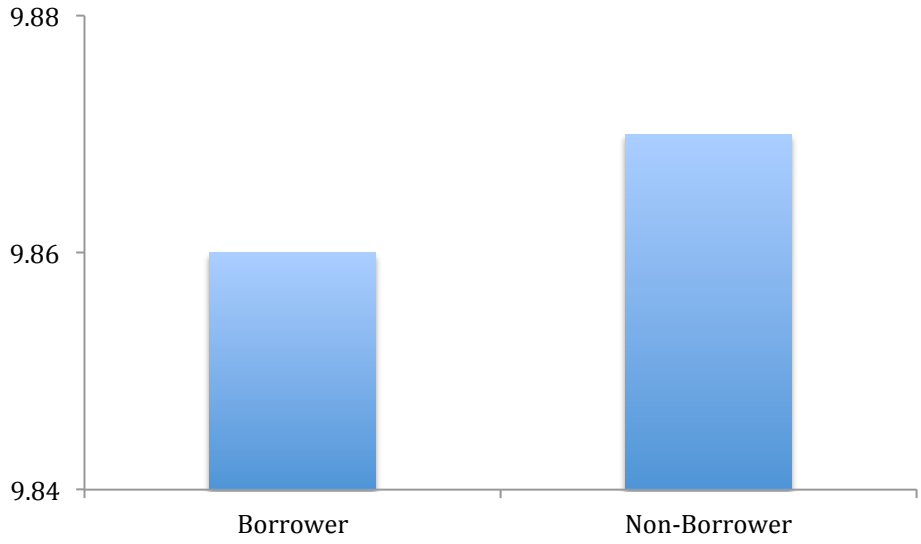
There is a risk of omitted variable bias, as it is not known which variables are predictors of functionings, capabilities at home and at work and the various dimensions of experiential utility. The impact of this possibility is reduced by introducing controls, which the literature suggests might potentially be material. There is also the possibility of simultaneous determination of variables in the capability approach, as the direction of causation is unclear. (For example, it is unclear whether functionings are covariates of differing dimensions of experiential utility, or if in fact an individual's experiential utility affects his or her functionings.[2])

5. Main Empirical Results

We begin with some results concerning associations between quality of life and borrowing status**.** Tables 1 to 5 offer a comparison of the mean outcomes for the sub-samples of borrowers and non-borrowers using the summary functionings index, sub-domains of capabilities at home and work, varying dimensions of experiential utility and several indicators of how credit is accessed and used. In the tables, independent sample t-tests are considered to investigate whether the differences in the mean scores for borrowers and non-borrowers are statistically significant.

It is particularly noticeable that borrowers have lower capabilities at home than non-borrowers. Table 1 shows that, across six dimensions of what an individual is able to do at home, non-borrowers have statistically greater capability in four of the six dimensions. For the various sub-domains of work capabilities and summary functionings index (see Fig. 1), while the mean scores of non-borrowers were higher than borrowers, they were not statistically significant. One explanation of the lower home-related capabilities of borrowers is offered by Karaivanov and Kessler (2016, pp. 2 – 3), who argue that borrowing from informal lenders (e.g. friends and family) involves pledging social collateral, which acts as a substitute for physical collateral. Using social collateral comes at a cost, as it is indivisible. If a borrower defaults on an informal loan, the relationship is materially damaged and social collateral is lost.

[2] As the empirical models used are estimated by ordinary least squares, this would indicate some risk of error in the parameters estimated. However, Ferrer-i-Carbonell and Fritjers (2004, p. 641) find little difference in coefficients estimated by ordinary least squares and ordered logit models and it has become widespread practice in the economics literature on subjective wellbeing to use ordinary least squares as a result, where the estimated coefficients apply to all values of inputs.



Notes:

1. n=150 for borrowers and n = 149 for non-borrowers

2. Average, based on eleven point Likert scale with '0' equalling strongly disagree and '10' strongly agree

3. *** significant at 1% level; ** significant at 5% level and *significant at 10% level

Fig. 1 Mean Scores for Functionings Index

Table 1 – Mean Scores for Capabilities at Home and Work

	Borrower		Non Borrower			
Home ("Thinking about your home life")	*Score*	*Std. Dev*	*Score*	*Std. Dev*	*P-value*	*Difference*
I am able to share domestic tasks within the household fairly	6.46	1.304	6.36	1.429	0.51	1.5%
I am able to socialize with others in the family as I would wish	6.34	1.284	6.40	1.433	0.691	-0.9%
I am able to make ends meet	5.33	1.454	5.83	1.519	0.004***	-9.4%
I am able to achieve a good work-life balance	5.25	1.456	5.74	1.504	0.004***	-9.3%
I am able to enjoy the kinds of personal relationships that I want	5.74	1.499	6.13	1.495	0.026**	-6.8%
I have good opportunities to feel valued and loved	5.63	1.552	6.25	1.39	0***	-11.0%

	Borrower		Non Borrower			
Work ("Thinking about work")	*Score*	*Std. Dev*	*Score*	*Std. Dev*	*P-value*	*Difference*
I am able tofind work when I need to	5.39	1.58	5.64	1.839	0.219	-4.6%
I am able to use my talents and skills at work	5.31	1.667	5.58	1.737	0.181	-5.1%
I am able to work under a good manager at the moment	4.92	1.837	4.98	1.832	0.778	-1.2%
I am always treated as an equal (and not discriminated against) at work	5.07	1.856	5.23	1.928	0.461	-3.2%
I have good opportunities for promotion or recognition at work	4.97	1.793	5.07	1.781	0.627	-2.0%
I have good opportunities to socialise at work	5.1	1.853	5.19	1.901	0.686	-1.8%

Notes:
1. n=150 for borrowers and n = 149 for non-borrowers
2. Score is an average, based on eleven point Likert scale with '0' equalling strongly disagree and '10' strongly agree
3. *** significant at 1% level; ** significant at 5% level and *significant at 10% level

The lower levels of home related capabilities (e.g. work-life balance or feeling loved) that borrowers experience relative to non-borrowers, may be partly explained by the possibility of defaulting and losing social collateral. To investigate further, the borrower sample was further split into informal and formal borrowers. Across four of the six dimensions of home capabilities,

informal borrowers had lower mean scores than formal borrowers, though the difference is only significant in one case. It is not clear whether informal borrowers were formally credit constrained and therefore could not access the formal banking system and therefore could only borrow from informal sources or that they had the choice and chose not to borrow from the formal banking system. What is potentially interesting is that the lower capabilities at home that informal borrowers reported relative to formal borrowers, indicated an implicit social cost that informal borrowers may not have considered when deciding to borrow from informal as opposed to formal sources.

Turning to measures of life satisfaction, we find clear evidence that borrowers report lower life evaluations and higher levels of stress. The indicator of advantage also shows that non-borrowers have higher levels of advantage than borrowers, though the *p*-value is not significant. These results are similar with findings elsewhere in the literature and already mentioned – see for instance, Angelucci et al., 2015, pp. 173 – 175; Karlan and Zinman, 2010, pp. 433 – 437; and Fernald et al., 2008, p. 1. These results are not completely at odds with the literature as: (i) different questions on life evaluation and emotional wellbeing were asked compared with the earlier studies; (ii) the levels of stress found in this paper are similar to Fernald et al. (2008, p. 1) and Karlan and Zinman (2010, pp. 433 – 436); (iii) the methodologies used are different; and (iv) the studies mentioned focused on formal credit interventions, whereas the results reported here incorporates both formal and informal borrowers (see Table 2). Our results are compatible with people borrowing because they are dissatisfied with the status quo and feeling under greater stress by virtue of the money they owe, but this interpretation would require research over time.

Table 2 – Sources of Borrowings

	Borrower *Percentage of total*
None	0.67%
Family	24.67%
Friends	42.67%
Shop	0.00%
Credit Card	11.33%
Pawn Brokers	1.33%
Money Lenders	0.67%
Bank	16.00%
Other	2.67%

Notes:

1. n=150 for borrowers and n = 149 for non-borrowers
2. 'Percentage of total' shows the percentage of total responses per category
3. Difference is calculated as percentage increase of Borrowers over Non-Borrowers
4. nm is 'not meaningful'

In Tables 3 through 4 a variety of characteristics of borrowers and non-borrowers are offered, some of which are found to be important and are reported on. Borrowers, which are found as a whole to be less happy than non-borrowers (the "Unhappy Borrower") and have higher time preference for current consumption than non-borrowers, which is consistent with related research from Ifcher and Zarghamee (2011, pp. 3109–3129) who find that sad people have higher current time preferences than happy people. One could infer, as a result, that individuals who are less happy, and accordingly have a higher propensity to consume today, may finance these consumption activities using debt. This seems plausible as Table 5 shows that borrowers use credit primarily for the purchase of durables, refinancing existing loans and the purchase of day-to-day goods and services. Far smaller amounts are used to pay for education bills, healthcare costs and none for starting up businesses.

Table 3 – Indicators of Subjective Wellbeing

	Borrower		Non Borrower			
	Score	*Std. Dev*	*Score*	*Std. Dev*	*P-value*	*Difference*
Life Evaluation	4.63	1.628	5.07	1.643	0.023**	9.50%
Happiness Index	11.27	2.661	12.70	2.924	0***	12.69%
Non-Happiness Index	9.85	3.26	8.87	3.319	0.011**	-9.95%
Stress	5.3	1.794	4.38	2.01	0***	-17.36%
Advantage	5.67	1.245	5.83	1.364	0.315	2.82%

Notes:
1. n=150 for borrowers and n = 149 for non-borrowers
2. Score is an average, based on eleven point Likert scale with '0' equalling strongly disagree and '10' strongly agree
3. *** significant at 1% level; ** significant at 5% level and *significant at 10% level

Table 4 – Characteristics of Borrowers and Non-Borrowers

	Borrower		Non Borrower			
	Score	*Std. Dev*	*Score*	*Std. Dev*	*P-value*	*Difference*
Financial literacy	3.52	2.854	3.02	2.384	0.102	14.2%
Written	0.97	0.162	0.93	0.262	0.062*	4.1%
Time Preference	5.90	2.097	5.23	2.266	0.008***	11.4%

Notes:
1. n=150 for borrowers and n = 149 for non-borrowers
2. Score based on eleven point Likert scale with '0' equalling strongly disagree and '10' strongly agree
3. *** significant at 1% level; ** significant at 5% level and *significant at 10% level

Table 5 – Use of Credit by Borrowers

	Borrower		
	Score	*Std. Dev*	*P-value*
Education	0.04	0.197	0.014**
Healthcare	0.09	0.282	0.0***
Durables	0.16	0.368	0.0***
Loans	0.14	0.348	0.0***
New Business	0.00	0	nm
Existing Business	0.00	0	nm
Old Age	0.02	0.14	0.083*
Saving	0.01	0.082	0.32
Consumption Smoothing	0.06	0.238	0.002***
Temptation Goods	0.09	0.282	0.0***
Day-to-Day	0.15	0.029	0.0***

Notes:
1. n=150 for borrowers and n = 149 for non-borrowers
2. Score is an average, based on a four point scale with '0' indicating HKD 0- 999 was borrowed for that purpose in the previous twelve months, '1' indicates HKD 1,000 - 1,999, '2' indicates HKD 2,000 -2,999 and '3' represents HKD 3,000+
3. *** significant at 1% level; ** significant at 5% level and *significant at 10% level
4. nm equals not meaningful

Regression Results

The results of the regression models for borrowers and non-borrowers are reported in this section. The broader findings (and in more detail, several of the key results) are presented, dealing with the production of subjective wellbeing, functionings and capabilities at home and at work.

Borrowing and Subjective Wellbeing

The results of the experiential utility models are displayed in Tables 6 through 11, as well as in Tables A1 and A2 in the Appendix. The models include both pooled and split-sample results for borrowers and non-borrowers. Two variations of the models are reported, the first in which the summary functionings index is the sole covariate and a second, where capabilities at home and at work are covariates. In this discussion, the focus is on the main specifications of these models, which include quality of life predictors found in the literature, as well as controls for the log of average household income and gender. A logarithmic transformation is applied to household income, as it represents a basic fact of perception known as Weber's Law, which applies generally to quantitative dimensions of perception and judgment. The rule is that the effective stimulus for the detection and evaluation of changes or differences in such dimensions is the percentage change, not its absolute amount. The logarithmic transformation reveals an important regularity of judgment that risks being masked when a dollar scale is used (Kahneman and Deaton 2010, p. 16490).

In Table 6, it is found that for variants of the main specification of the model, the summary functionings index is not a covariate of life evaluation, for either borrowers or non-borrowers, but that the home capabilities index (see Table 8) is a significant covariate for non-borrowers as is the work capabilities index for borrowers. It is also found that a range of socio-economic factors are significant. Some of these results are as expected. Kahneman and Deaton (2010,

p. 16492) suggest life evaluation is less sensitive to the day-to day and more sensitive to socio-economic factors, which would also explain the significance of the capabilities predictors and not summary functionings index. Potentially more interesting is the fact that for borrowers, opportunities at work are a significant predictor of life evaluation, whereas for non-borrowers, opportunities at home is a significant predictor, indicating that these groups may value their work-life balance differently. It is reported that for the borrower group (Table 6), in the presence of the summary functionings index, that log household income is significant covariate, suggesting that longer-run financial resources maybe an important consideration in the production of higher levels of life evaluation. Results in Table 6 also suggest that being a borrower is associated with lower overall life evaluation than for non-borrowers. This is after controlling for income and gender, as well as a list of other important socio- economic factors (marital status, recent bereavement, educational status, age). Whilst this finding appears to be relatively robust, it is not possible to be sure from the data. This is the case when controlling for the functionings index but not when controlling for capabilities. Which may reflect the fact that borrowing has a negative impact on life evaluation when controlling for short-term variations (activity involvement yesterday) but not longer term ones (capabilities). This is plausible and potentially analogous to the finding that parents are less happy than non-parents(despite the fact that most conceptions are freely chosen). In that case, it appears to be the time-stress induced by parenting that reduces subjective wellbeing, whereas fulfilment is in fact higher, as might be expected. Regarding the happiness index (Table A-1), summary functionings index is a covariate for non-borrowers but not borrowers, with similar results for happiness index as had been found for life evaluation within the realm of capabilities (Table A-2). As for life evaluation, the borrowing dummy variable is significant and negative as a determinant of happiness index (Table A-1), indicating that being a borrower is a determinant of lower levels of happiness than a non-borrower, an important finding in the context of one of our key results- 'The Unhappy Borrower'. The sensitivity of happiness index for non-borrowers to day-to-day activities as measured by functionings index is consistent with the literature (Kahneman and Deaton (2010, p. 16489).

Table 6 – Regression of Life Evaluation against Functionings Index

Life Evaluation in the presence of Functionings Index

Dependent Variable: Life Evaluation Index	Model (1)			Model (2)			Model (3)		
	B	Std. Error	Sig	B	Std. Error	Sig.	B	Std. Error	Sig.
Constant	4.28	0.694	0	6	0.588	0	5.998	0.598	0
Functionings									
Functioning Index									
FuncINT									
Credit Predictors									
Threshold Borrowing							-1.718*	0.908	0.06
Socio-economic Predictor									
Divorced	-0.573	0.408	0.163	-0.51	0.573	0.377	-0.507	0.582	0.384
Widow/ widower	2.661*	1.496	0.078	-0.77	1.432	0.59	-0.774	1.455	0.595
Age	-0.233*	0.136	0.091	-0.286	0.107	0.008	-0.286***	0.108	0.009
South Asian	-5.501***	1.5	0	-3.747	1.041	0	-3.747***	1.057	0
Education Level	0.507**	0.245	0.041	0.1	0.238	0.664	0.104	0.242	0.668
Job	0.017	0.181	0.927	0.05	0.174	0.777	0.049	0.176	0.78
DivorcedINT							-0.066	0.707	0.926
WidowINT							3.435	2.071	0.099
AgeINT							0.054	0.173	0.755
SouthINT							-1.753	1.817	0.336
EduLvlINT							0.403	0.342	0.24
JobINT							-0.033	0.251	0.896
Controls									
Gender	-0.028	0.286	0.922	-0.34	0.268	0.212	-0.336	0.272	0.218
GenINT							0.308	0.392	0.432
LogIncome	0.505*	0.272	0.066	0.12	0.285	0.675	0.12	0.29	0.68
LogIncINT							0.385	0.394	0.33
R-Squared	0.222			0.19			0.227		
Adjusted R-Squared	0.166			0.13			0.168		
n	150			149			299		

Note:
1. n = 299 for pooled sample. n = 149 for non-borrowers and n=150 for borrowers
2. *** : significant at 1% level; ** : significant at 5% level and *: significant at 10% level
3. Explanatory variables with an INT extension represent interaction variables
4. Model (1) represents Borrowers, Model (2) represents Non-Borrowers and Model (3) represents pooled results

Table 7 – Regression of Stress Index against Functionings Index

Stress Index in the presence of Functionings Index

Dependent Variable: Stress Index	Model (1)			Model (2)			Model (3)		
	B	Std. Error	Sig	B	Std. Error	Sig.	B	Std. Error	Sig.
Constant	6.38	0.834	0	7.66	0.788	0	7.656	0.76	0
Functionings									
Functioning Index	-0.216***	0.053	0	-0.275	0.061	0	-0.275***	0.059	0
FuncINT							0.059	0.081	0.466
Credit Predictors									
Threshold Borrowing							-1.276	1.153	0.27
Socio-economic Predictors									
Married	0.578	0.408	0.16	-0.42	0.371	0.262	-0.418	0.358	0.244
Divorced	0.407	0.572	0.478	0.69	0.792	0.385	0.69	0.763	0.367
Widow?/ widower	2.28	1.877	0.227	-0.4	1.914	0.833	-0.404	1.846	0.827
Education Level	0.588*	0.314	0.064	-0.38	0.309	0.226	1.622	1.339	0.227
South Asian	-5.324***	1.786	0.004	1.62	1.389	0.245	-0.376	0.298	0.208
MarriedINT							0.996*	0.555	0.074
DivorcedINT							-0.283	0.968	0.77
WidowINT							2.684	2.686	0.319
EduLvlINT							0.963**	0.442	0.03
SouthINT							-6.946***	2.289	0.003
Controls									
Gender	-0.501	0.328	0.13	-0.3	0.371	0.419	-0.301	0.358	0.401
GenINT							-0.199	0.494	0.687
LogIncome	0.09	0.315	0.776	0.53	0.358	0.139	0.534	0.345	0.124
LogIncINT							-0.444	0.476	0.352
R-Squared	0.189			0.22			0.242		
Adjusted R-Squared	0.13			0.16			0.184		
n	150			149			299		

Note:
1. n = 299 for pooled sample. n = 149 for non-borrowers and n=150 for borrowers
2. *** : significant at 1% level; ** : significant at 5% level and *: significant at 10% level
3. Explanatory variables with an INT extension represent interaction variables
4. Model (1) represents Borrowers, Model (2) represents Non-Borrowers and Model (3) represents pooled results

Table 8– Regression of Life Evaluation against Capabilities Indices

Life Evaluation in the presence of Capabilities Indices

Dependent Variable: Life Evaluation Index	Model (1)			Model (2)			Model (3)		
	B	Std. Error	Sig	B	Std. Error	Sig.	B	Std. Error	Sig.
Constant	3.118	1.049	0.004	1.791	0.892	0.047	1.791	0.941	0.058
Capabilities									
Home Capabilities	-0.027	0.032	0.398	0.089***	0.021	0	0.089***	0.022	0
Work Capabilities	0.089***	0.024	0	0.024	0.017	0.169	0.024	0.018	0.19
Home Capabilities INT							-0.117***	0.038	0.002
Work Capabilities INT							0.066**	0.029	0.024
Credit Predictors									
Threshold Borrowing							1.327	1.373	0.335
Socio-economic Predictor									
Divorced	-0.737*	0.388	0.06	-0.267	0.504	0.597	-0.267	0.532	0.616
Job	-0.075	0.178	0.674	-0.157	0.163	0.339	-0.157	0.172	0.363
South Asian	-2.987*	1.612	0.067	-3.354***	0.928	0	-3.354***	0.979	0.001
Age	-0.197	0.129	0.128	-0.2**	0.098	0.045	-0.2**	0.104	0.056
Education Level	0.167	0.235	0.48	0.154	0.208	0.459	0.154	0.219	0.482
DivorcedINT							-0.47	0.648	0.469
JobINT							0.082	0.242	0.736
SouthINT							0.367	1.822	0.841
EduLvlINT							0.012	0.313	0.968
AgeINT							0.002	0.161	0.989
Controls									
Gender	-0.13	0.275	0.638	-0.175	0.237	0.462	-0.175	0.25	0.485
GenINT							0.045	0.362	0.901
LogIncome	0.335	0.256	0.194	-0.023	0.25	0.926	-0.023	0.264	0.93
LogIncINT							0.358	0.36	0.32
R-Squared	0.316			0.378			0.363		
Adjusted R-Squared	0.26			0.327			0.308		
n	150			149			299		

Note:
1. n = 299 for pooled sample. n = 149 for non-borrowers and n=150 for borrowers
2. *** : significant at 1% level; ** : significant at 5% level and *: significant at 10% level
3. Explanatory variables with an INT extension represent interaction variables
4. Model (1) represents Borrowers, Model (2) represents Non-Borrowers and Model (3) represents pooled results

Table 9 – Regression of Stress Index against Capabilities Indices

Stress Index in the presence of Capabilities Indices

Dependent Variable: Stress Index	Model (1)			Model (2)			Model (3)		
	B	Std. Error	Sig	B	Std. Error	Sig.	B	Std. Error	Sig.
Constant	6.577	1.148	0	7.427	1.112	0	7.427	1.077	0
Capabilities									
Home Capabilities	-0.026	0.041	0.523	-0.132***	0.033	0	-0.132***	0.032	0
Work Capabilities	-0.005	0.03	0.877	0.053**	0.025	0.034	0.053**	0.024	0.027
Home Capabilities INT							0.106**	0.053	0.047
Work Capabilities INT							-0.057	0.039	0.145
Credit Predictors									
Threshold Borrowing							-0.851	1.603	0.596
Socio-economic Predictors									
Partner	-1.698	1.081	0.119	-0.051	1.979	0.98	-0.051	1.916	0.979
South Asian	-5.579***	2.038	0.007	0.873	1.417	0.539	0.873	1.372	0.525
PartnerINT							-1.647	2.219	0.459
SouthINT							-6.452**	2.516	0.011
Controls									
Gender	-0.42	0.341	0.22	0.019	0.363	0.959	0.019	0.352	0.958
GenINT							-0.439	0.498	0.379
LogIncome	0.199	0.328	0.545	0.24	0.359	0.505	0.24	0.347	0.49
LogIncINT							-0.041	0.485	0.933
R-Squared	0.085			0.132			0.154		
Adjusted R-Squared	0.037			0.085			0.105		
n	150			149			299		

Note:
1. n = 299 for pooled sample. n = 149 for non-borrowers and n=150 for borrowers
2. *** : significant at 1% level; ** : significant at 5% level and *: significant at 10% level
3. Explanatory variables with an INT extension represent interaction variables
4. Model (1) represents Borrowers, Model (2) represents Non-Borrowers and Model (3) represents pooled results

Table 10 – Regression of Home Capabilities Index against Credit and Socio-Economic Factors

	Home Capabilities Index in the presence of Credit and Socio-Economic Variables								
	Model (1)			Model (2)			Model (3)		
Dependent Variable: Home Capabilities Index	B	Std. Error	Sig.	B	Std. Error	Sig.	B	Std. Error	Sig.
Constant	22.519	2.742	0	22.883	2.943	0	22.883	2.672	0
Credit Predictors									
Application	0.393	0.414	0.345	-0.75	0.528	0.158	-0.75	0.479	0.119
Communication	0.228	0.488	0.641	0.239	0.646	0.712	0.239	0.586	0.684
Dignity	-0.316	0.441	0.475	0.654	0.467	0.164	0.654	0.424	0.125
Violence	0.832*	0.439	0.061	1.593***	0.49	0.002	1.593***	0.445	0
Signal	0.529	0.49	0.283	0.607	0.44	0.17	0.607	0.399	0.13
Group	-0.283	0.227	0.214	-0.324	0.266	0.227	-0.324	0.242	0.182
Convenience	-0.89**	0.41	0.032	-0.437	0.606	0.473	-0.437	0.55	0.428
Choice	0.998**	0.404	0.015	0.361	0.637	0.572	0.361	0.578	0.533
Old Age	3.512	3.622	0.334						
Healthcare	2.097	1.698	0.22						
Day-to-day	-3.347***	1.185	0.006						
AppINT							1.143*	0.669	0.089
OldINT							3.512	4.094	0.392
HealthINT							2.097	1.919	0.276
CommINT							-0.011	0.805	0.989
DigINT							-0.971	0.655	0.14
VioINT							-0.762	0.667	0.254
SigINT							-0.078	0.683	0.91
GroupINT							0.04	0.352	0.909
DayINT							-3.347**	1.34	0.013
ConINT							-0.454	0.719	0.529
ChoiceINT							0.637	0.737	0.388
Threshold Borrowing							-0.364	4.092	0.929
Socio-economic Predictors									
Financial Literacy	0.081	0.307	0.793	0.463	0.318	0.149	0.463	0.289	0.111
Entrepreneurial	0.92***	0.182	0	-0.22	0.242	0.366	-0.22	0.22	0.318
South Asian	-17.578***	5.159	0.001	0.889	4.279	0.836	0.889	3.886	0.819
Pawn-brokers	-4.531	5.942	0.447	-1.116	4.2	0.791	-1.116	3.814	0.77
FinINT							-0.382	0.451	0.398
PawnINT							-3.415	7.722	0.659
SouthINT							-18.468***	7.007	0.009
EntrepINT							1.14***	0.301	0
Controls									
Gender	1.111	0.848	0.193	-1.261	1.082	0.246	-1.261	0.982	0.201
LogIncome	-0.872	0.855	0.31	1.35	1.058	0.205	2.372*	1.372	0.085
GenINT							1.35	0.961	0.161
LogIncINT							-2.222	1.362	0.104
R-Squared	0.524			0.375			0.451		
Adjusted R-Squared	0.445			0.291			0.365		
n	150			149			299		

Note:
1. n = 299 for pooled sample. n = 149 for non-borrowers and n=150 for borrowers
2. *** : significant at 1% level; ** : significant at 5% level and *: significant at 10% level
3. Explanatory variables with an INT extension represent interaction variables
4. Model (1) represents Borrowers, Model (2) represents Non-Borrowers and Model (3) represents pooled results

Table 11 – Regression of Work Capabilities Index against Credit and Socio-Economic Factors

Work Capabilities Index in the presence of Credit Related and Socio-Economic Variables

Dependent Variable: Work Capabilities Index	Model (1)			Model (2)			Model (3)		
	B	Std. Error	Sig.	B	Std. Error	Sig.	B	Std. Error	Sig.
Constant	11.393	4.451	0.012	16.667	3.695	0	16.667	3.721	0
Credit Predictors									
Needs	0.577	0.501	0.252	0.367	0.45	0.416	0.367	0.453	0.418
Signal	1.161*	0.627	0.067	1.606***	0.427	0	1.606***	0.43	0
Education	5.366*	3.012	0.078						
Healthcare	2.541	2.427	0.298						
EduINT							5.366*	2.99	0.074
HealthINT							2.541	2.41	0.293
NeedINT							0.209	0.673	0.756
SigINT							-0.445	0.757	0.557
Threshold Borrowing							-5.275	5.778	0.362
Socio-Economic Predictors									
Financial Literacy	0.469	0.417	0.263	1.241***	0.357	0.001	1.241***	0.359	0.001
Job	1.436*	0.822	0.084	2.26***	0.835	0.008	2.26***	0.841	0.008
Age	-0.259	0.676	0.703	-1.498**	0.568	0.01	-1.498***	0.572	0.009
Entrepreneurial	0.828***	0.256	0.002	0.717**	0.29	0.015	0.717**	0.292	0.015
Education Level	1.845	1.275	0.151	-1.494	1.092	0.174	-1.494	1.1	0.176
South Asian	-21.01***	7.643	0.007	-10.293**	4.766	0.033	-10.293**	4.8	0.033
Married	-0.255	1.744	0.884	0.076	1.584	0.962	0.076	1.595	0.962
Divorced	2.299	2.295	0.319	-1.031	2.792	0.713	-1.031	2.812	0.714
Widow?/ widower	6.788	7.17	0.346	-0.762	6.594	0.908	-0.762	6.642	0.909
FinINT							-0.772	0.548	0.16
JobINT							-0.824	1.172	0.483
AgeINT							1.239	0.882	0.162
EntrepINT							0.111	0.387	0.774
EduLvlINT							3.339*	1.677	0.048
SouthINT							-10.717	8.98	0.234
MarriedINT							-0.331	2.355	0.888
DivorcedINT							3.33	3.62	0.359
WidowINT							7.55	9.736	0.439
Controls									
Gender	1.474	1.309	0.263	-1.091	1.235	0.379	-1.091	1.244	0.382
GenINT							2.565	1.799	0.156
LogIncome	-0.324	1.319	0.806	0.034	1.329	0.98	0.034	1.338	0.98
LogIncINT							-0.358	1.872	0.849
R-Squared	0.444			0.529			0.491		
Adjusted R-Squared	0.364			0.471			0.42		
n	150			149			299		

Note:
1. n = 299 for pooled sample. n = 149 for non-borrowers and n=150 for borrowers
2. *** : significant at 1% level; ** : significant at 5% level and *: significant at 10% level
3. Explanatory variables with an INT extension represent interaction variables
4. Model (1) represents Borrowers, Model (2) represents Non-Borrowers and Model (3) represents pooled results

For borrowers (Table A-1), the summary functionings index is not a covariate of the happiness index, whereas log income is, indicating that for this hedonic measure, longer-term financial considerations are more important for borrowers than day-to-day experiences. Presumably, having the income to pay back one's debts is a more important determinant of happiness. As already mentioned, borrowing money is a predictor of lower levels of happiness – 'The Unhappy Borrower', which is now discussed in more detail.

The descriptive results (Table 3) show that borrowers have lower experiential utility across all four indicators whilst the regression model (Table A-1) indicates that borrowing money is a determinant of lower levels of happiness. However, as already noted, it is not possible to prove causation and alternative scenarios are also plausible given causation may run in a differing direction. On the one hand, individuals may borrow as a result of being unhappy, for which there is inferred support from the related literature (Guven, 2012, pp. 701-704; Cryder et al, 2008, p. 525) or they may become unhappy as a result of borrowing money, to which there is also evidence (Walsemann et al, 2014, pp. 85-93). Given the evidence from both the empirical results here and the literature, it may be possible to infer that borrowing money and an individuals' happiness are simultaneously determined. If this interpretation is correct, an individual's negatively valenced emotional state may affect their decision-making regarding personal finances, which in turn may have a negative affect on their emotional level, resulting in a reinforcing feedback system.

The last dimension of emotional wellbeing, which is discussed, is stress (Tables 7 and 9). The day-to-day activities of an individual are found to be a significant predictor of stress for both borrowers and non- borrowers whereas the findings regarding an individual's opportunities at home and work and their relationship to stress, are similar to the results for non- happiness. A surprising result is that the borrower dummy variable (Tables 7 and 9, either in the presence of summary functionings index or capabilities) is insignificant as a predictor of stress, which is not consistent with the literature (Fernald et al (2008, p. 1) and Karlan and Zinman (2010, pp. 433-436)), which indicate borrowers have higher levels of stress than non-borrowers. This maybe because the borrower sample in this paper take loans predominantly from informal lenders (see Table 5), who may show greater flexibility in terms than formal lenders, a view often touted in the literature (Karaivanov and Kessler, 2016, p.2).

Borrowing, Functionings and Capabilities

Attention now turns to the production of objective wellbeing, particularly the indices of functioning activity, home and work capabilities and, specifically, the third key result of this paper.

How borrowers use credit (see Table 10 and 11) is likely important and reinforcing feedback loops may exist. A notable finding from the results is that no money is borrowed to either expand an existing business or start a business and little to finance education. Instead credit is used to purchase durables, refinance existing debt and purchase day-to-day goods. One explanation is that risk

aversion increases amongst informal borrowers (which represent the largest source of borrowings for borrowers) relative to formal borrowers due to the social collateral pledged when borrowing money (see Lee and Persson, 2013, p.1 for related literature). This finding is consistent with the descriptive statistics from this study, which are significant at the 1% level. This study's measure of risk appetite, 'Entrepreneurship', or an individual's willingness to take risk, show mean scores of 2.76 for informal borrowers and 5.39 for formal borrowers, based on a ten-point Likert scale. It is also reported that how credit is used (Tables 10 and 11) may be an important determinant of what borrowers are able to do at home and at work. The models suggest that using credit to pay for education is associated with improved levels of work capability (what we call 'good debt'), whereas credit used to pay for day-to-day goods and services is related to lower levels of opportunity at home (what we call 'bad debt').

Evidence from the literature is found to support these results; Rothstein and Rouse (2011, p. 149) in a study of the causal effect of student loans usage on employment outcomes found that incurring student debt caused graduates to choose higher salary jobs. However the results suggest that limited amounts of credit are used to finance education, perhaps because of the higher degree of risk aversion amongst informal borrowers, which is indicated here. Likewise, Kabeer (2001, pp. 63-84) finds both positive and negative effects exist regarding how borrowed money affects the role of female empowerment within the household. Whilst, the signs are unclear, the literature is suggestive of the existence of a pathway between borrowing money and household relations. It is possible that as borrowers borrow money predominantly from friends and family, household relations are affected given such informal borrowings, as already discussed, this may involve the pledge of social collateral.

It is also acknowledged the possible existence of other routes, given it is plausible that causation runs in a different direction. An individual who has lower opportunities at home, reflecting deprivations in the longer-term socio-economic capabilities of the individual, may in fact borrow more for day-to-day reasons. This interpretation would also be consistent with the literature, which argues that individuals use borrowed money in order to consumption smooth (Eswaran and Kotewal, 1990, pp. 473-482; Morduch, 1995, pp. 106-107; Morduch, 2016). Likewise, it is far from unfeasible to consider that individuals that have greater opportunities at work, are those same individuals that borrow money to use for education. It is also possible that that there are simultaneously determined variables in the models. As an example, individuals that use credit for education purposes, are more likely to get better jobs and those with better jobs or opportunities at work are more likely to invest in further education opportunities.

Turning to the R-squared of the models of objective wellbeing (Tables 10 and 11), they are between 0.3-0.6, which compares reasonably well to 0.4-0.5 found in psychology (Anand et al, 2009, p. 139). In contrast, for the models of experiential utility where functionings are the covariates, the R-squareds are lower, ranging from 0.2-03. The low R-squareds for the subjective wellbeing models described indicate that there are other factors not considered in the regressions, which demand future research.

6. Summary and Concluding Remarks

This paper was motivated by (a) the relative dearth of research into the affects of borrowing money and an individual's subjective wellbeing and (b) the growing recognition amongst economists that financial measures alone are not always sufficient to capture fully the benefits of economic progress for quality of life and human development. The main objective of this paper has therefore been to investigate whether increased access to and use of credit is associated with a higher quality of life, both in objective and subjective terms.

In this paper a theoretical framework is constructed, informed by Sen's capability approach to welfare economics, and used to construct data consistent with key theoretical concepts. Using these data, descriptive differences between borrowers and non-borrowers were identified, regarding what people actually do, are able to do and their experiential utility. Various analyses are then presented to show how the covariates of what people actually do and are able to do, as well as the varying dimensions of experiential utility, differ according to whether the individual is a borrower or not. The primary goal has been to show that it is possible to go beyond income-based approaches to evaluating socio-economic development amongst borrowers and non-borrowers, as has recently defined the literature in recent years, in order to show how objective and subjective wellbeing are produced and distributed between these two social groups. Key results include the facts that:

(1) borrowers have lower capabilities at home than non-borrowers and informal borrowers have lower capabilities at home than formal borrowers;

(2) borrowers are less happy on average than non-borrowers; and

(3) how borrowers use credit is likely important for a borrower's objective wellbeing.

On the one hand borrowing money seems to be associated with lower subjective wellbeing and home-related capabilities and there appears to be an implicit social cost to borrowing money from informal lenders in the form of lower home related capabilities. Furthermore, the way credit is used is important as it has differing effects on objective wellbeing, resulting in 'good debt' and 'bad debt'.

Implications for Policy

One could argue having read the preliminary results that developing policy to increase access to and use of credit may not be a good idea, unless serious safeguards are put in place. It is found that borrowers predominantly use credit to purchase day-to-day goods, consumption smooth and refinance existing loans, whilst limited amounts are used for education purposes and none to start up businesses. These results are not particularly surprising as the consumption needs of the poor often trump whatever investment opportunities they may have, a result which is consistent with Fafchamps (2013, p. 19). The preliminary results suggest that borrowers should be provided with better information on: (a) how to use credit – borrowing to finance education maybe good, whereas

borrowing to finance the purchase of the day-to-day may have undesirable side-effects; (b) individuals should be provided information on the implicit costs of borrowing from informal lenders, which are often not taken into account when deciding whether to borrow from informal lenders and (c) taught strategies of how to save money to finance their consumption and investment preferences, given the potential negative effects highlighted above.

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6,948 words excluding references and tables.

Appendix

Table A-1 - Regression of Happiness Index against Functionings Index

Happiness Index in the presence of Functionings Index

Dependent Variable: Happiness Index	Model (1)			Model (2)			Model (3)		
Constant	8.665	1.365	0	12.9	1.292	0	12.914	1.267	0
Functionings									
Functioning Index	0.091	0.075	0.231	0.245*	0.083	0.004	0.245***	0.082	0.003
FuncINT							-0.154	0.112	0.171
Credit Predictors									
Threshold Borrowing							-4.248**	1.883	0.025
Socio-economic Predictors									
Divorced	-0.106	0.817	0.897	-1.8	1.09	0.101	-1.8*	1.069	0.094
Age	-0.068	0.251	0.787	-0.41*	0.221	0.066	-0.41*	0.217	0.06
Married	0.607	0.601	0.315	0.14	0.576	0.805	0.143	0.566	0.801
South Asian	-9.574***	2.519	0	3.209*	1.901	0.094	3.209*	1.865	0.087
Education Level	0.645	0.431	0.138	-1.034	0.435	0.019	-1.034**	0.427	0.016
DivorcedINT							1.693	1.355	0.213
AgeINT							0.342	0.335	0.308
MarriedINT							0.464	0.834	0.579
SouthINT							-12.782***	3.175	0
EduLvlINT							1.679***	0.613	0.007
Controls									
Gender	0.401	0.463	0.388	-0.17	0.505	0.741	-0.167	0.495	0.736
GenINT							0.568	0.684	0.407
LogIncome	0.834*	0.444	0.063	0.41	0.491	0.408	0.408	0.482	0.398
LogIncINT							0.427	0.661	0.519
R-Squared	0.187			0.21			0.249		
Adjusted R-Squared	0.129			0.15			0.192		
n	150			149			299		

Note:
1. n = 299 for pooled sample. n = 149 for non-borrowers and n=150 for borrowers
2. *** : significant at 1% level; ** : significant at 5% level and *: significant at 10% level
3. Explanatory variables with an INT extension represent interaction variables
4. Model (1) represents Borrowers, Model (2) represents Non-Borrowers and Model (3) represents pooled results

Table A-2 - Regression of Happiness Index against Capabilities Indices

Happiness Index in the presence of Capabilities Indices

Dependent Variable: Happiness Index	Model (1)			Model (2)			Model (3)		
Constant	5.585	1.508	0	7.248	1.507	0	7.248	1.433	0
Capabilities									
Home Capabilities	-0.005	0.049	0.919	0.202***	0.04	0	0.202***	0.038	0
Work Capabilities	0.17***	0.036	0	-0.035	0.032	0.265	-0.035	0.03	0.24
Home Capabilities INT							-0.207***	0.064	0.001
Work Capabilities INT							0.206***	0.049	0
Credit Predictors									
Threshold Borrowing							-1.663	2.144	0.439
Socio-economic Predictors									
Married	0.978**	0.443	0.029	0.627	0.506	0.218	0.627	0.481	0.194
South Asian	-3.556	2.475	0.154	3.954**	1.81	0.031	3.954**	1.722	0.023
Age	-0.112	0.202	0.581	-0.394**	0.197	0.048	-0.394**	0.187	0.037
MarriedINT							0.35	0.672	0.602
SouthINT							-7.51**	3.132	0.017
AgeINT							0.282	0.284	0.322
Controls									
Gender	-0.054	0.404	0.893	-0.266	0.446	0.553	-0.266	0.424	0.532
GenINT							0.211	0.602	0.726
LogIncome	0.49	0.394	0.216	0.042	0.46	0.927	0.042	0.438	0.923
LogIncINT							0.448	0.605	0.459
R-Squared	0.36			0.29			0.365		
Adjusted R-Squared	0.32			0.245			0.323		
n	150			149			299		

Note:
1. n = 299 for pooled sample. n = 149 for non-borrowers and n=150 for borrowers
2. *** : significant at 1% level; ** : significant at 5% level and *: significant at 10% level
3. Explanatory variables with an INT extension represent interaction variables
4. Model (1) represents Borrowers, Model (2) represents Non-Borrowers and Model (3) represents pooled results

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