



## Article

# Access to financial services: the case of the 'Mzansi' account in South Africa

Kostov, Phillip, Arun, Thankom Gopinath and Annim, Samuel Kobina

Available at <http://clock.uclan.ac.uk/11843/>

*Kostov, Phillip ORCID: 0000-0002-4899-3908, Arun, Thankom Gopinath and Annim, Samuel Kobina (2015) Access to financial services: the case of the 'Mzansi' account in South Africa. Review of Development Finance, 5 (1). pp. 34-42. ISSN 1879-9337*

It is advisable to refer to the publisher's version if you intend to cite from the work.

<http://dx.doi.org/10.1016/j.rdf.2015.04.001>

For more information about UCLan's research in this area go to <http://www.uclan.ac.uk/researchgroups/> and search for <name of research Group>.

For information about Research generally at UCLan please go to <http://www.uclan.ac.uk/research/>

All outputs in CLoK are protected by Intellectual Property Rights law, including Copyright law. Copyright, IPR and Moral Rights for the works on this site are retained by the individual authors and/or other copyright owners. Terms and conditions for use of this material are defined in the [policies](#) page.

# Access to financial services: The case of the ‘Mzansi’ account in South Africa

Philip Kostov\*, Thankom Arun<sup>1</sup>, Samuel Annim

Lancashire Business School, University of Central Lancashire, Greenbank Building, Preston, Lancashire PR1 2HE, United Kingdom

## Abstract

The presence of rationing of financial services in the developing countries is a major obstacle to achieving sustainable growth. In recent years there have been co-ordinated efforts to increase the level of financial inclusion, i.e. to reduce the supply-side constraints restricting access to finance. This paper aims to understand household's latent behaviour decision making in accessing financial services, by analysing an entry level Mzansi account in South Africa. The willingness to access financial services is not taken as given, but it is instead defined by perceptions and attitudes. The Mzansi intervention is appealing to individuals with basic but insufficient financial education. Aspirations seem to be very influential in revealing the choice of financial services and to this end, Mzansi is perceived as a pre-entry account not meeting the aspirations of individuals aiming to climb up the financial services ladder.

© 2015 Africagrowth Institute. Production and hosting by Elsevier B.V. All rights reserved.

*JEL classification:* C52; D12; G29

*Keywords:* Access to finance; Perceptions and attitudes; Credit rationing; Variable selection

## 1. Introduction

The issues of financial and economic development have been a focus of substantial theoretical and empirical literature. Although there is some controversy over the direction of causality in the finance-growth relationship, financial systems are important for facilitating and maintaining economic growth. Furthermore, financial development is generally accepted to exert beneficial effects not only on growth but also in terms of poverty alleviation (see e.g. Beck et al., 2009). The latter further emphasises the importance of finance in relation to development, particularly when the very nature and functions of financial systems existing in Western economies and implicitly embedded in existing theoretical models become an inadmissible assumption. Traditionally empirical studies inves-

tigating the financial development relationship to growth have focused on financial depth. This fact conforms to an implicit assumption of universality and to some extent, uniformity of financial systems in terms of their functions. Focusing on financial depth essentially assumes all financial systems work in the same way (i.e. possess the same functions) and the overall (growth inducing) impact is simply a measure of magnitude, a magnitude that can be directly related to a measure of the development of the relevant financial systems. More recently analytical attention has turned to the issues of financial outreach and inclusion; something often referred to as access to finance. This is an important conceptual shift with far-reaching consequences.

The lack of access to finance in developing economies could, nevertheless, be an equilibrium outcome resulting from imperfect market competition. In terms of credit provision, the relevant theoretical models are the ones explaining credit rationing. The implicit assumption of credit to a source for expansion of economic activity and therefore, growth has, to some extent, biased analytical attention towards credit, but many of the underlying arguments in such models can be readily extended to provision

\* Corresponding author. Tel.: +44 1772 894542; fax: +44 1772 892906.  
E-mail addresses: [PKostov@uclan.ac.uk](mailto:PKostov@uclan.ac.uk) (P. Kostov), [TGArun@uclan.ac.uk](mailto:TGArun@uclan.ac.uk) (T. Arun), [SKAnnim@uclan.ac.uk](mailto:SKAnnim@uclan.ac.uk) (S. Annim).

<sup>1</sup> Tel.: +44 1772 894546; fax: +44 1772 892906.

Peer review under responsibility of Africagrowth Institute.

of other financial services. Such a one-sided focus in the theoretical literature is, nevertheless, understandable bearing in mind that credit has important consumption smoothing function (and hence can lead to better outcomes in a dynamic context).

In the access to finance discourse, we are concerned with “type 2” rationing in the sense of [Stiglitz and Weiss \(1981\)](#) where some applicants are refused loans altogether despite their willingness to pay the market rate of interest. There are two defining characteristics of this theoretical reasoning that transpire in most empirical studies related to access to finance. The first relates to that the (latent) demand for credit (or general financial services) is taken for given. The other, which to some degree follows from the former, is the focus at the supply side.

Let us briefly review the type two credit rationing. There are two main sources of this type of rationing, namely hidden action and hidden (project) type. Hidden action means that the effort to ascertain the project risk is either too costly, or the project risks itself is non-verifiable. The former entails the classical transaction cost argument: banks incur similar screening costs, and thus they will prefer lending larger credits. In such cases, a credit rationing equilibrium may arise, because any increases in the loans create moral hazard effects (in the case of hidden action) and adverse selection (in the case of hidden type). At a macro-economic level, these negative effects dominate the effect on the interest rate change and by reducing the profitability of the banks make it impossible for them to attract sufficient finance via deposits. Note that from lenders’ point of view, the hidden action problem arises because there is not sufficient information about the potential clients. Therefore, the lack of studies about the potential demand contributes to this exclusion, since it prevents lenders from ascertaining the nature of the demand and thus the lack of such information creates a hidden action problem. Of course, research on the determinants of the latent demand for financial services in its own cannot eliminate the problem since the transaction cost argument will still hold.

[Bester \(1985\)](#) showed that in hidden types model by posting collateral borrowers can achieve a separating equilibrium with no credit rationing. The extent to which this can be achieved, depends, of course, on the relative availability of collateral. Whenever the net worth of such is low, this separation may still be unachievable ([Stiglitz and Weiss, 1981](#)). Given that in a typical type of cases of lacking access to finance one is likely to consider in a developing country, the availability of any type of collateral has to be excluded from the very outset, why do we even invoke such an argument? Note, however, that the same line of reasoning could be applied to any form of ‘third party collateral’ i.e. when a third party provides collateral that eliminates the hidden type of problem. If one assumes that the demand is present, it would be logical for the lenders to jointly provide such ‘third party collateral’ in expanding the provision of financial services. Such an intervention could be beneficial for the lenders if the suppressed demand is existing in that the individual risks faced by lenders will essentially be pooled together into a common insurance-like pool, and the aggregate benefits would exceed the individual lenders’ costs. It is, nevertheless, important to stress that if the latent demand that we just assumed is not there, or it is not as strong as assumed, the above logic breaks

down. Therefore, studies of this demand are also necessary if a coordinated intervention designed to overcome the hidden type problem is being considered. Implementing such a coordinated intervention could prove unsustainable whenever this latent demand is weak. Nevertheless, there is another theoretical argument in favour of such an intervention. As [De Meza and Webb \(2006\)](#) show credit rationing implies an infinite marginal cost of credit to the borrower. A stylised fact of the poor in a development context, however, is their high-risk aversion. Under high and extreme risk aversion, the marginal cost of credit will reduce, which says that in such circumstances, the existence of demand becomes very suspect. One could nonetheless, hypothesise that one of the drivers for such high-risk aversion is the exclusion from formal financial services itself, which forces poor households to avail to alternative risk coping strategies. This suggests that introducing coordinate intervention can by providing access to financial services reduce risk aversion and therefore, via increased marginal cost (for these) ultimately create demand. This solicits studying demand under such interventions.

The strategies, from a client point of view, to eliminate rationing discussed in the theoretical models include reducing the size of the project, postponing its start and saving (to self finance larger part of the project). Reducing the size of the project assumes it is divisible, which may or may not be the case. Since most ‘projects’ involving poor ‘micro-entrepreneurs’ would be rather small, size reduction will have limited scope. Postponement, on the other hand, will only work if it does not have been deteriorating effects on the projects net value. Note that one may combine these strategies, and such combinations may overcome the credit rationing problem. We will argue that whenever characteristics that facilitate the above strategies, such as e.g. propensity to save and interest in longer-term financial planning are present within the poor, these indicate the presence of latent demand.

The general implication of the Stiglitz-Weiss model is that if banks have a way to distinguish between different classes of risk, rationing will reduce and disappear. The theoretical suggestions of how to reduce and eliminate credit rationing (e.g. [Bester, 1985](#); [Besanko and Thakor, 1987](#); [Chan and Thakor, 1987](#); [Parker, 2000](#); [Lensink and Sterken, 2002](#)) are essentially proposing different means to achieve this. Note, however, that the informal market can be typically viewed as a substitute for not well functioning formal markets (in the presence of rationing) and hence should incorporate some of these rationing avoidance means. Note, for example, that informal markets are highly segmented. The conventional wisdom views this as a way to prevent arbitrage possibilities (and hence an imperfection). Imposing segmentation can, however, also be seen as a type of discrimination among different types of clients, which achieves a separating equilibrium under conditions of initial rationing. In simple words, the credit rationing is a type of pooling equilibrium, where all clients get the same conditions), while separating equilibria provide means for distinguishing different clients. Whether the latter arises from a clients’ actions (such as providing extra collateral or savings) or by a supply-side initiative (such as intentional market segmentation), the outcome is qualitatively the same.

The implicit assumption of the barriers to financial services argument is on the supply-side constraint. This is either because one may not be able to directly observe the latent demand for financial products whenever the supply constraints are in place or because “those who have access but choose not to use services pose less of a problem for policymakers” (Beck and Demirguc-Kunt, 2008). Relaxing the supply-side barriers would, however, bring the potential lack of demand for financial services to the forefront with important policy implications. After all coordinated policy interventions designed to expand access to finance is costly and such costs will need to be compared to the potential benefits. When the barriers to access are removed, voluntary non-participation reduces these benefits. Hence studying the determinants of demand for financial services becomes an important research question. In this type of analysis the important question becomes whether exclusion from financial services is voluntary or involuntary. It is clearly infeasible to try to carry out reliable distinction between these two forms of exclusion in the presence of binding barriers established at the supply side. There are, however, two cases where such investigations could be conducted. One is when individuals are transferred into a different environment where such barriers are not implemented. For example, Osili and Paulson (2008) examined the determinants of financial market participation among immigrants in the USA and found that institutional factors have profound effects. They hypothesised that the main channel through which these institutional factors affect market participation are beliefs. Beliefs, however, are difficult to measure and in a more general, framework can be represented by alternative indicators such as values, attitudes, perceptions and levels of financial literacy. We argue that these have to be considered when evaluating the potential effect of expanding access to finance. The uptake of new financial services bridging over existing barriers will define who will benefit the expanded access to finance.

Investigations such as this of Osili and Paulson (2008) are important in that they open a totally new research agenda and allow characterisation of voluntary participation in accessing financial services. Transplanting individuals from one environment to a totally different one may tell us a lot about attitudes and culture, but it does not sufficiently well capture the institutional framework established in their home country. It would be much more useful if the decision to avail to different forms of financial services could be investigated in a more natural environment, i.e. in a developing country context. This is where the second case in which such investigation could be conducted arises. Studying such financial choices in the latter case could be very useful in better characterising what defines financial behaviour and due to the natural setting of such a study, it can provide even more useful guides for future policy interventions.

This paper takes a preliminary step in this research quest considering the case of the Mzansi intervention in South Africa. The Mzansi intervention represents a coordinated roll-out of financial services in targeting the poor and vulnerable. Rarely, is the experience of such an intervention that draws on a linkage between private commercial banks and either state-owned banks or an act of legislation to expand financial access. Furthermore,

the co-ordinated and wide-ranging scope of the Mzansi intervention provides an opportunity to study the individual financial choice in a developing context without the presence of binding supply side restrictions.

Kostov et al. (2012, 2014a, 2014b) produce some results on this relationship using a range of variable selection methods, but unlike the present paper fail to provide a coherent theoretical model underlying their application. Furthermore we take into account possible methodological pitfalls in these previous applications.

## 2. Background

Until the end to the apartheid era in 1994, financial services in South Africa were predominantly accessible to the non-black community and therefore, by default excluded the economically weaker households (Meagher and Wilkinson, 2002). In South Africa, the ‘Mzansi’ account intervention offers a peculiar case in which commercial banks, and a state-owned financial institution take a lead role to expand access to financial services. FinMark Trust (2009) cautions that although significant successful indicators are identifiable with the ‘Mzansi’ account intervention replicating this strategy require similar country level socio-economic and financial landscape characteristics. Furthermore, the evidence of 1.6 million accounts classified as dormant within the first four years after the Mzansi account operation underscores the importance of circumspection and identification of the drivers and perceptions of household’s decision to open and maintain an account.

Following the Financial Service Charter (FSC) policy recommendations the ‘Mzansi’ account which was initiated in 2004 offered entry-level accounts. The intervention was situated in the broader context of financial services outreach that is scale (i.e. number of clients), depth (i.e. poorer clients), scope (i.e. wide range of services) and breadth (i.e. reaching different social groups). Operating under the broader government policy framework of economically empowering the black community in South Africa, the FSC aimed at providing effective access to transaction and savings financial services. While the initiative was not legally backing, consenting financial institutions, through some form of social contract were committed to expanding access and providing affordable financial services to the wider population. Beyond national goals, participating institutions, four main private banks in South Africa (Absa, Nedbank, First National and Standard) and a state-owned financial institution (Postbank) was motivated based upon a consensus of shared reputational and financial risk.

In terms of depth of outreach, the specific target of the issuing institutions was that 80% of the poorest households, defined as the fifth segment of the South African living standard population, should have effective access to transaction and savings products and services. We investigate a demand side concern – household inherent motivation in choosing a financial service. In particular, their financial education background (how financially literate they are), opinions on their financial needs, aspirations and attitudes. Our central research question is – in what way

does these hidden factors (education, perception and attitudes) affect the uptake of Mzansi account?

### 3. Mzansi's access to finance framework

Claessens (2006) identifies four pre-requisites for improved access to financial services, namely; availability, reliability, flexibility and continuity of access to financial services. Two of the four requirements that are availability, and reliability can be identified with the 'Mzansi' account initiative. Firstly, the worth and reputation of the four commercial banks coupled with the credibility of the state bank naturally invokes confidence of sustainability and non-exploitation in potential clients. Secondly, the widespread coverage of all the issuing institutions, especially Postbank, presents potential clients with proximity of a financial service point of transaction either physically or electronically. Broadly speaking the overall aims of the Mzansi intervention seems to have been reached, although the financial sustainability of the scheme and therefore, its attractiveness to banks could be questioned (FinMark Trust, 2009). Initial evaluations of the Mzansi intervention have focused on directly inquiring clients about their opinion and attitudes. The mode of elicitation of their motivation, however, could condition their stated opinion. To better understand what truly makes a customer go for a Mzansi account; it is preferable to investigate the choice of Mzansi conditional on their background. Conventional financial wisdom would dictate that the relevant background variables are those measuring who they are. When access to financial services is concerned, these include their financial literacy, i.e. the elements of their financial 'education' and understanding of financial concepts. These will differentiate the actual from the stated scope of the Mzansi intervention. Note, however, that simple comparison to the distribution of these characteristics between holders and non-holders can to a large extent capture this. The internal motivation of clients could, however, be measured by their general attitude towards financial literacy, namely what they think is missing from their financial understanding and what they want to learn. Providing characterisation of the Mzansi choice based on these internal motivations would not simply complement the 'who they are' characterisation, but would also describe in some more detail the realised scope of the Mzansi intervention. Therefore, such an analysis would contribute towards a better fine-tuning of the actual scope of Mzansi, so that it better reflects the needs of its customers. This could have twofold benefits. First it could go some way in addressing the issue of high share of inactive Mzansi accounts. Second it would undoubtedly help banks better target their clients by better differentiating Mzansi from their entry level products and hence contribute to achieve a longer-term sustainability of the scheme. We have briefly discussed the issues of financial rationing in the preceding sections. Instead of seeking means to obtain information about the clients as in all separating equilibria, Mzansi intervention tries to avoid rationing in a totally different way. It still pools together clients, hoping that the benefits from incorporating 'good' clients will outweigh the disadvantages of including the 'bad' ones. Hence the Mzansi approach aims at pooling equilibrium, rather than a separating one, as in e.g. micro-finance and informal finance

channels. In a dynamic view, providing basic services widening participation in financial markets could be advantageous in providing further information that banks can use to achieve separating equilibria (i.e. to distinguish well with bad clients). The other potential advantage of such a scheme is the potential reduction of demand-side rationing. Long-term credit rationing on the supply side can, however, lead to learning effect inducing demand-side rationing. See, for example, Kon and Story's (2003) theory of the discouraged borrowers. Hence the presence of supply side rationing creates transaction costs (e.g. borrowers know that it will be costly and probably unsuccessful to apply to the formal sector and can directly approach informal lenders). In this way supply side rationing leads to demand depression (or re-allocation to the informal sector) and increased risk aversion, which further reduces demand. Mzansi is supposed to eliminate this demand depression and hence could be expected to have dynamic learning effects. In this particular study, due to its preliminary and exploratory nature we will ignore such dynamic effects, but one needs to be aware of them.

### 4. Data

The empirical section of the paper relies on the 2007 Finscope South Africa dataset. Finmark Trust launched Finscope in 2003 in an attempt to establish credible benchmarks for the use of, and access to, financial services in South Africa. The aim was to achieve a measure and understanding of consumer demand across transactions, savings, credit and insurance categories. The sample frame of the Finscope data consists of all South Africans aged 16 years and above. The nationally representative data is based on enumeration areas and stratified multistage sampling technique. The 2007 Finscope dataset was collected from 3900 households using face to face interviews from April to May 2007. The scope of the data was categorised under two broad headings namely, living standard and financial services. The former captures issues such as income, quality of life, and household demographics, while the latter tracks national financial access patterns and pathways in terms of products and service providers and household financial decision trees and perceptions.

In this analysis, we use 102 variables, grouped in the following categories: basic literacy, understanding financial terms, targets for financial advice, financial education desired and financial perception. The full listing of employed variables and their exact definitions are available upon request.

Here we will only briefly describe these categories. Basic literacy contains a single indicator variable. The understanding of financial terms category includes 17 variables that quantify whether the respondents comprehend the actual meaning of a number of financial terms, ranging from simple ones such as bad debt and loan to increasingly more complex ones such as pieces of financial legislation. One could hypothesise that clients would need some basic financial understanding in order to select themselves into the Mzansi intervention, but having better understanding would mean that they would not be satisfied with the basic features offered by Mzansi and would require more sophisticated products.



The target for financial advice category includes 15 variables asking whether the respondents would use certain sources in order to obtain financial advice. The sources range from informal ones (such as family and friends) to formal professional type of advice providers (such as financial institutions and independent brokers). Furthermore, some of the sources could be formulated in such a way that respondents may not properly understand them and/or different types of advice sources could be bundled into the same category (e.g. “A financial advisor other than an independent broker (e.g. tax consultant, auditor)”).

Further 16 variables describe what type of financial education respondents desires. These variables imply the respondents do not possess this form of financial education. Most importantly, however, they measure their intrinsic aspirations to further themselves. People aspiring to obtain further financial education could aspire to move up the financial access ladder. Therefore, even if their background (financial education) places them on a particular step in this ladder, their aspirations can provide additional motivation, and hence they may be motivated to move up. In this way, they may end up at a higher step, simply because this is where they (aspire to) belong. Hence this category measure and quantifies the inherent motivations of banking clients. With respect to Mzansi, which is essentially a pre-entry level account, one could hypothesise that most types of expressed desire to obtain further financial education would move clients up towards the banks’ entry level accounts and hence have a negative impact on Mzansi uptake.

Finally, we have two categories of financial perceptions variables. These ask people, whether they agree with some statements. In this way, the internal motivations and perceptions towards financial behaviour are evaluated. The financial perceptions grid 1 variables ask factual questions about actual behaviour, while grid 2 variables refer mostly to attitudes (opinion, trust, etc.). Thus, the two categories of financial perception complement each other by measuring two facets of the same phenomenon.

## 5. Methodology

Since our dataset consist entirely of factor variables, a binary dependent variable type of model is a natural choice within the modelling framework. In particular, the logistic regression is a common choice for modelling framework in such situations. For variable selection, we have used a penalised regression approach. Previous analysis of this issue used the Dantzig selector (Kostov et al., 2012), the adaptive lasso method and a range of other frequentist and Bayesian regularisation methods (Kostov et al., 2014b) and considered the uncertainty in the variable selection procedures (Kostov et al., 2014a). There is however an important methodological issue that needs to be taken into account. When there are groups of highly correlated variables, something that is not unusual in empirical studies, most penalised approaches tend to (arbitrarily) select only one variable from each group. This makes the resulting models difficult to interpret, since variables that are strongly associated with the outcome may not be included into the model simply because they are also strongly correlated with a variable that is included. This

kind of difficulty can be illustrated e.g. by the results from alternative estimators, presented in Kostov et al. (2014b) where different methods seem to select different variables from each of the underlying categories. While in some cases since in many datasets such as in the present ones multiple variables can be viewed as proxies for a number of underlying latent factors, different methods selecting different variables from the same categories may not impact substantially on the interpretation of the result, this is by no means guaranteed. Furthermore the latter will only occur if these categories (employed in the results interpretation) have been correctly identified. The latter assumes some pre-existing knowledge about the structure of the analytical problem, which in many ways goes against the general logic of a variable selection methods generally designed for structure discovery. It is therefore of paramount importance to account for this underlying correlation structure and in such way to immunise empirical findings against the above undesirable property of regularisation variable selection methods.

The group-wise least absolute shrinkage and selection operator (LASSO) can deal with groups of correlated variables, but it requires that the relevant group are pre-specified. Bondell and Reich (2008) proposed the OSCAR (octagonal shrinkage and clustering algorithm for regression) approach that performs variable selection for regressions with highly correlated predictors.

The OSCAR estimator can be formally defined as:

$$\beta(\lambda_1, \lambda_2) = \underset{\beta}{\operatorname{argmin}} \left\{ \ell(\beta) + \lambda_1 \sum_{j=1}^p |\beta_j| + \lambda_2 \sum_{j < k} \max\{|\beta_j|, |\beta_k|\} \right\}$$

where  $\ell(\beta)$  is the corresponding loss function (in this case the negative log-likelihood for the logistic regression model),  $p$  is the number of parameters (to be estimated), while  $\lambda_1$  and  $\lambda_2$  are non-negative penalty parameters (to be tuned).

The OSCAR method can simultaneously perform variable selection and cluster the important variables. It achieves this by employing a weighted combination of  $L1$  (absolute deviations) penalty term  $\sum_{j=1}^p |\beta_j|$  and a pair wise  $L_\infty$  (i.e. maximum) penalty  $\sum_{j < k} \max\{|\beta_j|, |\beta_k|\}$  for the coefficients. The  $L1$  penalty effectively shrinks the coefficients towards zero, hence introducing sparsity and by eliminating unimportant variables performs variable selection. The pairwise  $L_\infty$  penalty, on the other hand, has the effect of encouraging equality of coefficients by penalising large differences between coefficients. Hence the OSCAR approach eliminates unimportant variables, but also groups the important ones in clusters with similar coefficients.

If we set  $\lambda_2 = 0$  the OSCAR estimator reduces to the LASSO which produces sparse estimates but no clustering. The effect of the latter, as discussed above, is that whenever there are groups of highly correlated variables, the algorithm will tend to select one variable from each such group. With  $\lambda_2 > 0$ , the grouping effect keeps correlated variables together. Note also that with  $(\lambda_2/\lambda_1) \rightarrow \infty$ , the grouping effect will prevail resulting in clustering with no variable selection. The exact values to the penalty parameters, which can be chosen by cross-validation, define the nature of the estimator. The theoretical results for any regularisation estimator are established with regard to the optimal amount of shrinkage (i.e. in this case the optimal

values of  $\lambda_1$  and  $\lambda_2$ ). Employing cross-validation (or any other method) to select these parameters is, however, very demanding from computational point of view, since it will require multiple evaluation of the objective function. This computational cost can greatly reduce the appeal of such method. It is therefore, if methods that circumvent this are available. In particular, for the introduction of the LARS (least angle regression) algorithm of Efron et al. (2004) have revolutionised regularisation approaches. Efron et al. (2004) have shown that the whole regularisation path for the LASSO is piecewise linear and the LARS algorithm can compute it for a range of shrinkage values at the computational cost of a single least squares fitting. This has led into a search for similar fast regularisation path algorithms. Once such an algorithm is available the repeated optimisations of the underlying problem are no longer needed. This allows the implementation of cross validation to choose the appropriate shrinkage parameters. Regularisation path algorithms are even more valuable when there is more than one shrinkage parameter (as in OSCAR). In this paper, we implement the Local Quadratic Approximation (LQA) algorithm of Fan and Li (2001) with an OSCAR penalty and use 5-fold cross validation to choose the amount of shrinkage in both directions (i.e. the combination of penalty parameters  $(\lambda_1, \lambda_2)$ ). The LQA algorithm is not as computationally efficient as the LARS one, but has the added flexibility that it is universally applicable. While the LARS algorithm is strictly speaking only applicable to a LASSO type problems in linear models, it is possible to modify the LQA algorithm (which was initially introduced to deal with the SCAD penalty) to a wide variety of alternative penalty terms and models. In this case, we have a logistic regression (generalised linear model) with a composite (OSCAR) penalty.

## 6. Results

The LQA provides us with the regularisation path for the OSCAR estimator of the logistic regression of the choice of Mzansi account on the set of 102 variables, described under the data section for a range of different regularisation parameters. A five-fold cross-validation is then applied to the output of the LQA algorithm, and the optimal amount of shrinkage is selected thus producing the final estimated model. The latter is summarised in Table 1, which presents the selected independent variables (i.e. the variables with non-zero coefficients) and their estimated coefficients.

Out of the 102 candidate variables, only 15 are retained in the estimated model. Here we briefly summarise the results. Before we do so however, note the following details about the results interpretation. As already discussed since our variables are basically indicators, they are expressed in the same units which mean the estimated coefficients are naturally ‘standardised’. In addition to allowing for direct application of the OSCAR algorithm this also facilitates results discussion about the sense that we can directly compare different coefficients in terms of their magnitude. In this case, the strength of the relative effects will be directly proportional to the estimated coefficients. In some cases, however, the fact that given variable is not included in the final model (i.e. the lack of impacts) could be an interesting and

Table 1  
Estimation results.

Variable	Coefficient
Understanding of financial terms – bad debt	0.147
Understanding of financial terms – garnishee order or emolument order	0.118
Targets for financial advice – independent broker	1.006
Targets for financial advice – a financial advisor other than an independent broker (e.g. tax consultant, auditor)	0.514
Financial education desired – how to make effective use of technology, such as cellphones or ATMs, to better manage your finances	–0.402
Financial education desired – how to work out how much credit you can afford/pay back on	–0.305
Financial education desired – how to select the best investment products	–0.109
Financial education desired – none	0.511
Financial perceptions grid 1 – you try to save regularly	0.129
Financial perceptions grid 1 – as soon as money is deposited into your account you withdraw it	0.473
Financial perceptions grid 1 – you go without basic things so that you can save	0.2373
Financial perceptions grid 1 – you hand over some or all of your money to a friend or family member for safekeeping or to guard it	–0.205
Financial perceptions grid 1 – if you do not have enough money to pay all your debts, you pay one debt one month and the next month you pay another debt	0.168
Financial perceptions grid 1 – you have a will or last testament	–0.170
Financial perceptions grid 2 – when it comes to money, young people know more than older people	0.127

meaningful result in itself and could deserve attention. Additionally, for ease of interpretation we apply boldface formatting to the negative coefficients, making it easier to distinguish them from the positive ones. Let us now proceed with the results.

First, the basic literacy variable does not discriminate between Mzansi account holders and non-holders. Since basic literacy can be expected to be a pre-requisite to any form of access to finance, it could be expected to discriminate between individuals with and without such access. Note, however, that since the individuals without Mzansi comprise of both people lacking access and people who use better than the basic Mzansi access, such a variable cannot differentiate Mzansi holders from the rest.

Next, two variables from the “understanding of financial terms” categories are retained. These are Bad debt and Garnishee order or emolument order. Bearing in mind that this category has an almost natural hierarchy from simpler to more complex terms, the selected terms lie towards the lower end of this hierarchy. Therefore, the individuals selecting themselves into the Mzansi system only possess some understanding of basic financial terms, i.e. have a minimal financial education. They need such basic understanding in order to be motivated to seek access to finance. Had however, they possessed better financial knowledge; they would have opted for more advanced forms of access, from the basic entry accounts upwards.

Only two of the variables in the category “targets for financial advice” are selected. Since the sample also contains individuals with no financial access and such with enhanced (compared to Mzansi) access to finance, the model finds it difficult to explicitly differentiate between differences that could be attributable to these two alternative categories. A major reason for this is the fact that in contrast to the “understanding of financial terms” category, here it is difficult to find similar natural hierarchy, which means that the differentiation of the choice of Mzansi from below (i.e. against no access) and above (i.e. better access) is pooled together. The latter was not a problem with the previous category due to the natural hierarchy, but in terms of the sources of financial advice, the lack of such confuses matters. Furthermore, it is possible that the wording of the options within this category could be confusing for respondents. The selected variables are Independent broker and a financial advisor other than an independent broker. Hence the Mzansi holders seek generally independent financial advice. This excludes family members and friends, as well as the providers of financial services. One could assume that these (unselected) sources of financial advice are seen as being more partial. Additionally, the existing basic financial understanding pushes them to seek some independence in making financial decisions. Their financial literacy being just that, basic, however, means that they do not feel sufficiently confident in judging for themselves advice that can be seen as being somewhat biased, and therefore, they prefer a truly independent opinion. The coefficient for independent broker is by far the largest of any explanatory variable. Given that we interpret this variable also in the sense that some kind of impartial financial advice is sought, this may look slightly out of line. Remember that the OSCAR algorithm implicitly groups correlated variables and force the coefficient in the same group to converge. This obviously has not happened here, which means that the two variables in this category are not highly correlated. One reason for this could be that there might be a scope of interpretation of what the latter variable actually means. In this sense such as elicitation effects could be translated into different underlying meaning for different types of respondents. If we take into account that in the actual spelling of the underlying question terms such as tax consultant and auditor are mentioned as examples, it may appear strange that this variable was selected, and that it increases (rather than decreasing) the likelihood of opting into the Mzansi intervention.

The next category is “financial education desired”. Four variables from this category feature in our model. One of these makes the choice of Mzansi more likely, while the other three act in the opposite direction. First of all, seeking no further financial education makes one more likely to choose Mzansi. What this reveals is the following: Mzansi holders have reached a level of financial literacy, but do not strive to move further, they are happy where they are. The other three selected variables in this category make a decision to choose Mzansi less likely. This means that in general looking for further financial education expresses desire and aspirations to move further up the financial access ladder. This interpretation is reinforced by the type of these three variables. The first of these variables relates to the effective use of technology (hence moving into other financial

access channels such as e.g. mobile banking). The other variable relates to working out credit repayments. This could show a desire to overcome debt, but also maybe planning for minor investments. The last variable in this category relates to selecting investment products, which undoubtedly accounts for aspirations far beyond the basic access to financial services offered by the Mzansi intervention. What is also highly informative is that what variables (from this category) are not selected. In particular, most of these refer to basic financial literacy such as e.g. understanding interest rates. As discussed above such variables cannot be effectively discriminate between Mzansi holders and individuals with no financial access. The financial aspirations can distinguish Mzansi from above, but not from below, and most of these omitted variables are essentially measuring such low level aspirations. Hence aspirations are important determinants of the choice of the Mzansi intervention from an individual point of view, since it is much more important who they want to be, rather than who they actually are.

The next two categories are the financial perceptions. Only one variable from the second grid is retained in the final model. Remembering that the second grid measure stated, as opposed to acted upon perceptions (i.e. elicited from their actual behaviour) in the first grid, this may simply reflect an elicitation problem. The unreliability of stated as opposed to revealed preferences is not by any means a novel fact. The variable from grid 2 (i.e. stated perceptions) refers to that agreeing with the statement that young people know more about money than older ones makes the choice of Mzansi more likely. This finding is all but logical given that recent (and no so recent) innovations in banking have been linked to introduction of new technologies such as e-banking, (mobile) phone banking, ATMs and banking agents networks. Since older people find it more difficult to deal with technical innovations, particularly in more traditional societies, such as assertion is to be expected.

The revealed perceptions show an interesting picture. There are six selected variables from this category. This shows that on one hand revealed perceptions are related to (i.e. correlated to) other determinants of behaviour, something that lies at the core of our conceptual model. This correlation forces the estimation algorithm to retain more variables from this category. Moreover, the inclusion of so many variables from this particular category reveals that the perceptions and attitudes are very important in defining the decision to choose a given financial service (in this case Mzansi). The most influential (i.e. the one with the largest coefficient) of these variables states that Mzansi holders generally agree with the statement (i.e. individuals agreeing with this statement are more likely to choose Mzansi) that money is to be withdrawn as soon as possible. This is consistent with the known fact that many Mzansi accounts are used mainly for receiving payments. This attitude to using Mzansi mainly as a vehicle for receiving money is very important in the structure of perceptions. Note, however, that although its relative effect is about twice the effect of the next in terms of importance variable in this category, it is not as dominant as one could have expected. Bearing in mind that five more variables in this category with broadly similar in terms of magnitude effects, this dominance is somewhat reduced. One could speculate that a motivation to



withdraw money as soon as possible could be a sign of liquidity constraints, that may be somewhat alleviated if incomes were to improve. Such a conjecture, however, can only be properly tested in a dynamic setting, which the cross-sectional dataset we use here does not allow us to do. The other variables in this category, however, tell a rather interesting story. Two of these reveal a preference towards saving ('you try to save regularly' and 'you go without basic things so that you can save'). Furthermore using informal channels for saving (using friends or family for safe-keeping money) reduces participation in Mzansi. Putting these together reveals a positive attitude for saving and incorporation into the formal financial services channels. This preference towards saving is well defined in that putting together all the three effects above is commensurable with the motivation for simply receiving payments. The next variable reveals a small debt aversion effect. One would need to put the latter in the wider context. Given the general debt awareness and the actual phrasing of the statement: "If you don't have enough money to pay all your debts, you pay one debt one month and the next month you pay another debt", the small coefficients reflect more actual inability to realise debt reduction strategy, rather than lack of desire to do so. This means that debt is seen as a serious problem among Mzansi account holders. Together with the possible liquidity constraints, this could be a symptom of a demand-side financial depression, possibly caused by the long-term supply-side driven exclusion from financial services. Therefore, the success of the Mzansi intervention may depend crucially on the general economic situation and poverty alleviation measures that reduce the indebtedness of the present and future customers. This suggests that not everything is doom and gloom with Mzansi. It provides a hint that it could, in principle, become sustainable for the banks from financial point of view. Note however, that this would only be possible if these preferences become realised, i.e. if a sufficient share of the Mzansi population can afford to save and reduce indebtedness, which in turn depends on a number of other factors such as e.g. economic growth, employment opportunities, etc. Furthermore, the relatively small in magnitude coefficients suggest that these offshoots of possible future financial sustainability are rather fragile and could be shadowed by the present climate of financial austerity. Note that savings accumulation is one of the ways to overcome type 2 credit rationing. Hence savings inclination could also indicate the presence of rationed demand. If this is the case, their behaviour is tuned to overcome credit rationing constraints. We can therefore assume that the segment of the population exhibiting such characteristics is long-term sustainable and potentially growth generating. This is an important result that deserves further investigation.

The last variable may appear slightly counterintuitive. It refers to the fact that having a will makes one less likely to opt into Mzansi. What is counterintuitive is not the effect itself, which is rather logical, but the actual inclusion of this variable. This is a variable that suggests a higher level of financial planning, which logically viewed would be characteristics of individuals with a better level of financial access. Hence this variable distinguishes Mzansi 'from above'.

## 7. Conclusions

This paper investigated the determinants of demand for financial services with regard to the pre-entry Mzansi account intervention in South Africa. On its own and on average, taking into account the relative prominence of the latent motivations and attitudes that define its uptake, Mzansi does not look promising from both banks' point of view and with regard to freeing a previously unrealised demand for financial services. However, such conclusions should not be surprising since it is a pre-entry account. Our results hint for possible demand-side rationing, due to long term exclusion from financial services. The elimination of supply-side driven exclusion from finance via Mzansi can therefore free such latent demand that cannot manifest itself in a cross-sectional data setting. One need to take into account that it is unreasonable to expect that all Mzansi account holders will be the prime target for banks. The relative importance of the model coefficients, however, suggests that such sustainability segments exist.

Financial education brings customers into Mzansi. We find no evidence that increasing the level of financial education (literacy) takes them further up to the financial access ladder. However, aspirations (which also can be translated in terms of financial educations) do move individuals up. It is reasonable to assume that providing (further) financial education can develop and foster such aspirations and move household up to the financial access ladder (and probably out of poverty). We find that Mzansi holders, on the one hand, view the account, mainly as a vehicle for receiving payments, but on the other hand, are motivated to save. However, the real potential of Mzansi account lies in enabling customers to moving up in the financial access ladder.

## Acknowledgements

We are grateful to FinMark Trust for kindly providing the data used in this study. This research has been supported by the Economic and Social Research Council under grant RES-238-25-0031.

## References

- Beck, T., Demirguc-Kunt, A., 2008. Access to finance: an unfinished agenda. *World Bank Econ. Rev.* 22 (3), 383–396.
- Beck, T., Demirguc-Kunt, A., Honohan, P., 2009. Access to financial services: measurement, impact, and policies. *World Bank Res. Obs.* 24, 119–145.
- Besanko, D., Thakor, A., 1987. Collateral and rationing: sorting equilibria in monopolistic and competitive credit markets. *Int. Econ. Rev.* 28 (3), 671–689.
- Bester, H., 1985. Screening versus rationing in credit markets with imperfect information. *Am. Econ. Rev.* 75, 850–855.
- Bondell, H.D., Reich, B.J., 2008. Simultaneous regression shrinkage, variable selection and supervised clustering of predictors with OSCAR. *Biometrics* 64, 115–123.
- Chan, Y., Thakor, A., 1987. Collateral and competitive equilibria with moral hazard and private information. *J. Finance* XLII (June (2)), 345–361.
- Claessens, S., 2006. Access to financial services: a review of the issues and public policy objectives. *World Bank Res. Obs.* 21 (2), 207–240.

- De Meza, D., Webb, D.C., 2006. Credit rationing: something's gotta give. *Economica* 73 (292), 562–578.
- Efron, B., Hastie, T., Johnstone, I., Tibshirani, R., 2004. Least angle regression. *Ann. Stat.* 32, 407–451.
- Fan, J., Li, R., 2001. Variable selection via nonconcave penalized likelihood and its oracle properties. *J. Am. Stat. Assoc.* 96, 1348–1360.
- FinMark Trust, 2009. The Mzansi Bank Account Initiative in South Africa, [http://www.finmarktrust.org.za/documents/R\\_Mzansi\\_BFA.pdf](http://www.finmarktrust.org.za/documents/R_Mzansi_BFA.pdf)Date (accessed March 2010).
- Kon, Y., Storey, D.J., 2003. A theory of discouraged borrowers. *Small Bus. Econ.* 21, 37–49.
- Kostov, P., Arun, T., Annim, S., 2012. Determinants of access to finance: an investigation into the Mzansi intervention. *Eur. J. Dev. Res.* 24 (3), 397–412.
- Kostov, P., Arun, T., Annim, S., 2014a. Banking the unbanked: the Mzansi intervention in South Africa. *Indian Growth Dev. Rev.* 7 (2).
- Kostov, P., Arun, T., Annim, S., 2014b. Financial services to the unbanked: the case of the Mzansi intervention in South Africa. *Contemp. Econ.* 8 (2), 191–206.
- Lensink, R., Sterken, E., 2002. The option to wait to invest and equilibrium credit rationing. *J. Money Credit Bank.* 34 (1), 221–225.
- Meagher, P., Wilkinson, B., 2002. Filling the Gap in South Africa's Small and Micro Credit Market – An Analysis of Major Policy, Legal and Regulatory Issues. In: IRIS Discussion Papers on Institutions and Development. Paper No 02/11, University of Maryland, August 2002.
- Osili, U.O., Paulson, A., 2008. What can we learn about financial access from U.S. Immigrants? The role of country of origin institutions and immigrant beliefs. *World Bank Econ. Rev.* 22 (3), 431–455.
- Parker, S.C., 2000. Saving to overcome borrowing constraints: implications for small business entry and exit. *Small Bus. Econ.* 15 (3), 223–232.
- Stiglitz, J., Weiss, E., 1981. A credit rationing in markets with imperfect information. *Am. Econ. Rev.* 71 (3), 393–410.