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Time-inconsistency, liquidity and the demand for commitment savings products

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Final Project Report

Project title:	Time-inconsistency, liquidity and the demand for commitment savings products (1-VCC-VPAK-VXXXX-37207)
Period covered:	01/11/2014 to 31/06/2016
Principal Investigators:	Rachel Cassidy & Simon Quinn
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EXECUTIVE SUMMARY

Low savings rates and low levels of capital investment among small businesses have long been thought to inhibit growth in developing countries. One of the primary explanations for low savings rates that has been put forward in the literature are self-control issues, which are believed to play a significant role in leading small business owners to divert income into consumption rather than savings and investment (Fafchamps et al., 2014). When savings products with "commitment"-type features have been offered specifically to micro-entrepreneurs, high demand has been observed especially from females. However, usage rates and re-adoption rates have often been low.

In this context, this project seeks to understand the role of self-control in particular as a potential driver of financial decisions and demand for commitment savings amongst female microfinance borrowers, and to separate out the role of underlying patience compared to anticipated and unanticipated changes in income. This can help identify whether self-control issues are as important and widespread as has been suggested, and whether they are likely to be the key determinant of failures to save and take-up of commitment products. This is also an important step in evaluating whether the benefits of commitment savings products are likely to outweigh the costs, in terms of tying up individuals' liquidity and thus their ability to self-insure against shocks. Furthermore, if it appears that demand for commitment savings products is high but is not driven by self-control issues, then further research into "other-control" may be needed, along with savings products that are more specifically tailored to shielding resources from the demands of others.

We conducted an experiment with 530 females in the Sargodha district of Punjab, Pakistan.[1] These females are existing clients of the rural development and microfinance organisation National Rural Support Program (NRSP), and are a highly relevant survey population given that NRSP is currently piloting the introduction of commitment savings-type products with its client base in various areas of Pakistan. We interviewed each individual twice, collecting detailed information on her income expectations and realisations and conducting incentivized activities to measure her time preferences and risk preferences. We randomised whether we paid the survey participation fee at the first or the second interview, in order to study the effect of cash-in-hand on individuals' responses. We also randomly surveyed half of all individuals prior to the onset of the wheat harvest in late April, and

[1] We also conducted extensive pre-testing and piloting prior to implementation, see section "Methodology and activities undertaken" for further details.

half after the onset of the harvest, in order to understand how these women's income profiles and behaviour changes before and after liquidity constraints are eased by the harvest.

We find that self-control issues may be a lot less significant and stable a determinant of financial behaviour than previously thought: individuals appear much less as if they suffer from "self-control" issues if they are paid at the first rather than the second interview, and if they are interviewed after rather than before the harvest. This suggests that the fact that the poor are often liquidity-constrained can lead economists to believe mistakenly that they have self-control issues (present-bias). Furthermore, "self-control" problems have either zero or negative correlation with individuals' self-reported demand for different types of commitment savings products. We also find that self-reported demand for commitment savings products with both a withdrawal commitment (money cannot be taken out before a certain date) and a deposit commitment (a certain amount must be deposited each week) is significantly higher amongst those individuals interviewed after the harvest compared to before.

The key policy recommendations are as follows. First, NGOs, banks and governments should think twice before offering commitment savings products purely on the basis of overcoming "self-control" problems, as these may be a lot less widespread than originally believed. Instead, more work should be done to understand the role of other possible benefits of commitment savings products such as reminders to save (Karlan et al., 2016) and overcoming "other-control" issues. Indeed, better savings products might be designed which help alleviate issues of inattention and "other-control" issues but at the same time do not tie up individuals' liquidity to the extent that they are unable to self-insure against shocks. Finally, once suitable savings products are identified, NGOs and governments should think carefully about the timing of when these products are offered, as take-up is likely to be higher at times such as the post-harvest period when liquidity constraints and uncertainty have been eased.

Overall the project met its objectives and was completed on-time and on-budget. We have had sustained engagement with and excellent support from our implementing partner National Rural Support Program (NRSP), both at regional (Sargodha) and national levels. We also received invaluable advice and ongoing support from members of the Lahore School of Economics' Centre for Research in Economics and Business (CREB) and Lahore University of Management Sciences (LUMS).

Figure 1- An NRSP borrower demonstrates her sewing business

CONTEXT

Low savings rates and low levels of capital investment among small businesses have long been thought to inhibit growth in developing countries. One of the primary explanations for low savings rates that has been put forward in the literature are self-control issues, which are believed to play a significant role in leading small business owners to divert income into consumption rather than savings and investment (Fafchamps et al., 2014). Other authors have emphasised "other-control" issues, namely the pressure to redistribute to family and friends (Baland et al., 2011). In recent years, a proliferation of "commitment savings" products have been developed and offered to poor individuals to help them overcome self-control and "other-control" issues (Ashraf et al. 2006; Brune et al. 2011; Dupas & Robinson 2013a; John 2014).[2] Initial take-up has typically been high, although usage rates and re-adoption rates have often been low. When illiquid savings products have been offered specifically to micro-entrepreneurs, high demand has been observed especially from females, but with the same issues in terms of non-use and failure to re-adopt (Dupas & Robinson, 2013b).

At the same time, measurement of self-control problems amongst the poor has often been imprecise – including through use of hypothetical rather than incentivized measures – and has failed to take into account anticipated and unanticipated changes in the poor's income, which may affect their responses even to incentivized measures. There is therefore a lack of clear evidence on the extent to which self-control problems really drive a lack of savings and the demand to take up commitment savings products.

In this context, this project seeks to understand the role of self-control in particular as a potential driver of financial decisions and demand for commitment savings amongst female microfinance clients, and to separate out the role of underlying patience compared to anticipated and unanticipated changes in income. This can help identify whether self-control issues are as important and widespread as has been suggested, and whether they are likely to be the key determinant of failures to save and take-up of commitment products. This is also an important step in evaluating whether the benefits of commitment savings products are likely to outweigh the costs, in terms of tying up individuals' liquidity and thus their ability to self-insure against shocks. Furthermore, if it appears that demand for commitment savings products is high but is not driven by self-control issues, then further research into "other-control" may be needed, along with savings products – especially for poor women – that are more specifically tailored to shielding resources from the demands of others.[3]

More broadly, the proposed project responds to calls by various development bodies for research into ways of increasing savings in developing countries; see for example Karlan et al. (2014), which explicitly promotes this agenda with the support of the Gates Foundation and UNU-WIDER.

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[2] In Pakistan, the most salient and widespread example of an existing financial product with commitment-savings features are ROSCAs, known in Pakistan as "committees". Aside from their credit features, ROSCAs are arguably used by many members as a group-based technology for committing to saving in regular instalments (Afzal et al., 2014).

[3] Lack of self-control issues (i.e. present-bias) at the individual level does not mean that households are irrational to be willing to pay for commitment. A household may still act as if it has a self-control problem (i.e. is present-biased) even if its individual members are time-consistent, as long as their discount rates differ (Adams et al., 2014) and households may make inefficient financial decisions when spouses act non-cooperatively (Schaner, 2015). Indeed, individuals may be willing to pay to deal with "other-control" problems, such as informal taxation by one's spouse or relatives (Schaner, 2013), including by demanding commitment products (Brune et al., 2011). However, if intra-household bargaining or more general "other-control" issues are the source of demand for commitment, rather than present-bias per se, then this could imply a very different solution. For example, one could avoid using deposit commitments and/or withdrawal commitments to tie up liquidity altogether, and instead provide perfectly liquid but "discreet" bank accounts to women with low household bargaining power.

Furthermore, this is also in line with calls by leading development practitioners to prioritise women's financial inclusion in order to promote gender empowerment.[4] Indeed, academic authors have offered evidence that commitment savings in particular may increase females' bargaining power in the household (Ashraf et al., 2010).

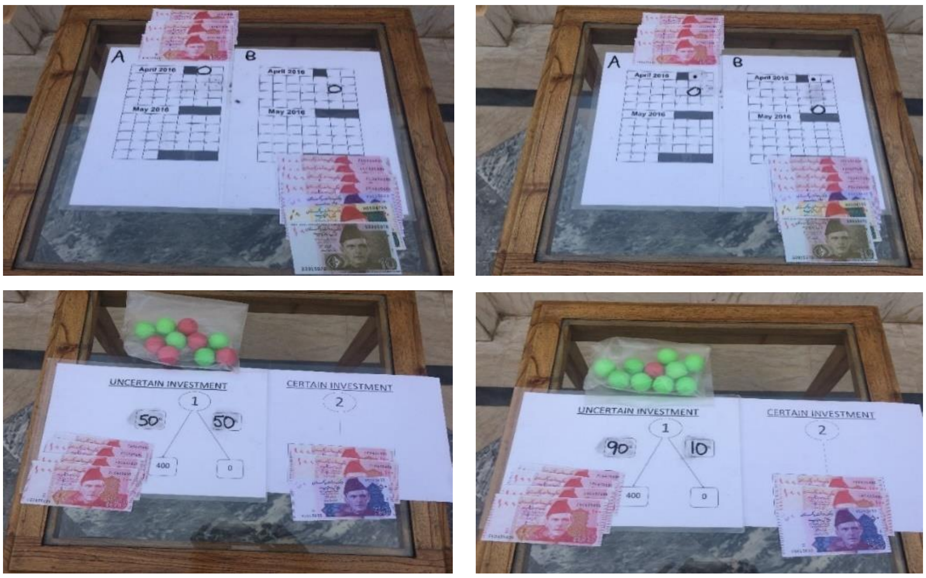
METHODOLOGY AND ACTIVITIES UNDERTAKEN

The project comprised a field experiment with 530 female clients of NRSP, which was implemented as follows:

Pre-testing and piloting

We first presented the experimental design at informal seminars at the University of Oxford and Stanford University, and received very useful feedback from these academic audiences in terms of refining the design. In December 2015 – January 2016 we then ran a series of pre-tests in Pakistan. Following what is increasingly becoming best-practice when designing experiments in developing countries, we began by pre-testing the activities in more controlled settings and with more educated subjects than in the eventual setting and study population: specifically, we first pre-tested with university students at LUMS, and then pre-tested with urban micro-entrepreneur clients of Akhuwat Bank in Lahore. This allowed us to refine the survey instruments substantially, and we were then ready to pre-test in a setting representative of the actual roll-out setting, namely with NRSP clients in Hafizabad – the district neighbouring the location of the actual roll-out. In March 2016, we returned to conduct enumerator training at NRSP regional offices in Sargodha and also ran a full pilot in three villages directly before commencing the actual roll-out. This ensured that the enumerators were fully familiar with the experimental protocols before beginning the full roll-out.

Figure 2 - Materials for time-preference (top) and risk-preference (bottom) elicitation activities



4 http://www.worldbank.org/en/results/2013/04/01/banking-on-women-extending-womens-access-to-financial-services

Roll-out

In March-June 2016 we ran the full roll-out in Sargodha, working with NRSP staff and a team of enumerators hired by NRSP. We interviewed 530 female clients of NRSP across 53 villages[5], sampled using random selection from NRSP client lists in those villages. Each interview comprised a survey on income expectations and realisations, as well as a series of incentivized activities designed to measure time preferences (including "present-bias", or "self-control" issues), risk preferences, and understanding of maths and probability. During the first interview we also collected key data on demand for different types of commitment savings products. We interviewed each female twice, with interviews two weeks apart. This was crucial, as it allowed us to measure consistency of responses over time and it also allowed the effect of (measured) real-life income changes to affect responses over time. We also implemented an experiment wherein half of individuals were paid their participation fee at the first interview whilst half were paid at the second interview, in order to provide experimentally-controlled income changes over time. Furthermore, we designed the survey period such that a randomly-chosen half of individuals received their first interview in March or early April before the onset of the wheat harvest, whereas half received their first interview during late April and May after the onset of the wheat harvest and prior to the start of Ramadan.

Budget narrative

Overall the project met its objectives and was completed on-time and on-budget. The only two minor adjustments to the original budget were as follows: first, for the roll-out we decided to use tablet-based surveying instead of paper-based surveying, as we discovered that this would be much more cost-effective and would also produce much higher-quality data by allowing continuous data monitoring. We therefore shifted a proportion of the budget away from hiring data entry clerks and towards purchasing Android tablets and a server subscription. This was approved by the IGC office, and the eleven tablets purchased have now become the property of IGC Pakistan for use in future IGC-funded projects. Second, instead of hiring a UK-based RA, we hired research assistants from LSE and LUMS to conduct the translation and project monitoring activities. This improved communication between the research team and NRSP, and also provided the opportunity for knowledge exchange between the research team and three promising Pakistani economics students. Neither of these changes affected the overall budget, but rather mean that the final budget shows slightly different proportions in each of the categories.

Figure 3 - The project implementation team: NRSP enumerators (back row), Sargodha office regional staff (front left and front right extremes), research assistants from LUMS and LSE (front inner left and inner right), and PI Rachel Cassidy (front centre).

[5] These villages were selected on the basis of having more than ten clients, and on not having been selected to participate in another study which was ongoing at the time.

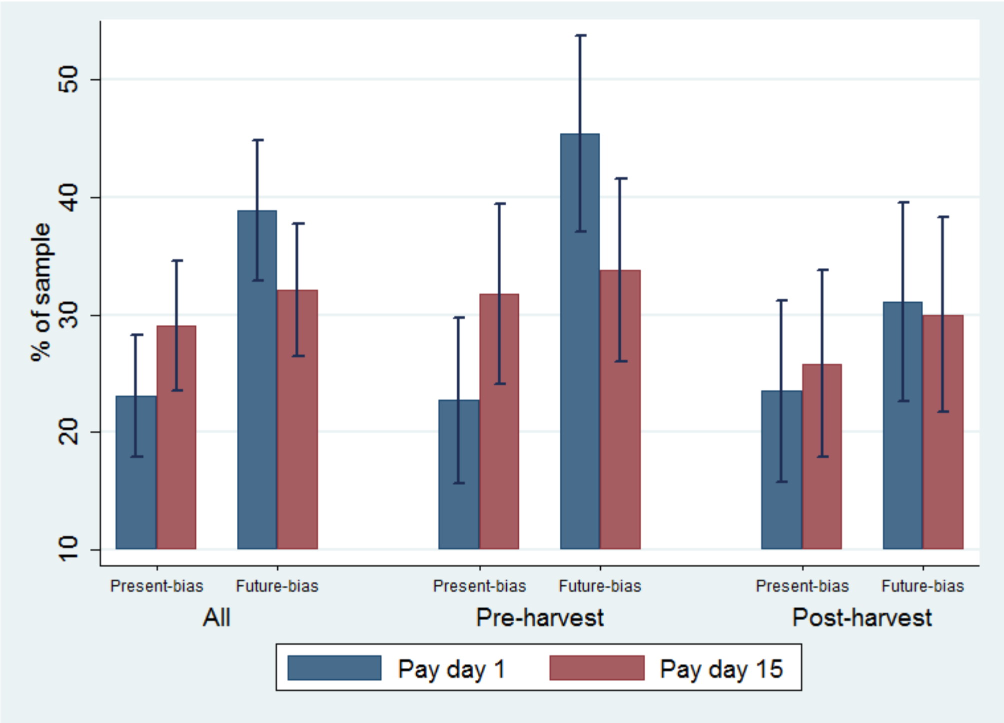
Design refinements

We made some refinements to the original project design, which we are confident have improved both the quality of the academic research produced and its usefulness to our partner NRSP. We originally planned to study commitment savings in the context of joint savings. However, the more we developed our experimental design, and following useful feedback that we received from presenting the experimental design to leading academics at Stanford and Oxford, the more we realised that there are still fundamental conceptual and empirical questions about individual commitment savings that have not yet been explored, and which should be answered before expanding commitment savings products to the realm of joint products. Indeed, Dr Quinn's very recent work elsewhere in Pakistan has shown low take-up of individual commitment savings, which underscores the idea that the drivers of demand even for individualised commitment are still not fully understood. We therefore modified our design to pursue these fundamental questions, maintaining a context of individual lending where we are able to study them most directly. In sum, our refined design first precisely measures individuals' time preferences, risk preferences and income expectations exactly as in the original design, but then examines what these imply for demand for individual rather than joint commitment savings products. On a practical level, we kept a similar sample size and set of activities to the original design, but interviewed individuals one-by-one in their homes rather than running group sessions. We discussed at length with national and regional management at NRSP who were very happy with the refined design and research questions.

PRELIMINARY RESEARCH FINDINGS

Figure 4 presents the main experimental results on self-control issues. Individuals are typically thought of as having a self-control problem if they exhibit "present-biased" decisions over time-dated monetary payments, i.e. if they are less patient about payments in the near future compared to the more distant future; whilst they are categorised as the opposite if they exhibit "future-biased" decisions, i.e. if they are more willing to be patient now compared to in the more distant future. In the full sample, receiving the participation fee on day one compared to day fifteen makes an individual significantly less likely to appear "present-biased", i.e. to have a "self-control problem", and significantly more likely to appear ``future-biased'', i.e. to be more patient about now rather than later. Thus it appears that measures of "present-bias", which are usually assumed by economists to proxy self-control problems, may actually reflect the fact that individuals are facing liquidity constraints, and indeed may disappear when those liquidity constraints are eased. Similarly, when the sample is split into women who received their first interview before the harvest versus after the onset of the harvest, we see that individuals are more likely to appear "present-biased" (and "future-biased") if interviewed before the harvest, thus these measures of self-control issues are likely actually in part simply measuring whether individuals are facing liquidity constraints. Moreover, the effect of the participation fee is largest for women interviewed prior to the harvest. This is consistent with the idea that the pre-harvest period is one of high liquidity constraints, whereas the post-harvest period is one of relaxed liquidity constraints, since the timing of the participation fee has a big impact on easing liquidity constraints for individuals before the harvest but has much less of an effect for individuals interviewed after the harvest.

Figure 4 - Effects of the experimentally-randomised participation fee timing (day one or day fifteen) on day one measures of time preferences, full sample and sample split by whether day one interview took place pre- or post- harvest.



In terms of demand for commitment savings, when participants are asked whether they would take up various commitment savings products if they were to be offered by NRSP, we see several striking patterns as illustrated in Table 1. First, participants appear to prefer accounts with deposit commitments only, followed by withdrawal commitments only, followed by both withdrawal and deposit commitments. Since withdrawal commitments can be considered as more binding than deposit commitments, and having both types of commitment is clearly more binding than having just one type, it therefore appears that participants would prefer weaker to stronger forms of commitment savings accounts. Second, respondents seem to prefer commitment plans in which the end date is decided for them, rather than being allowed to choose the length of the plan themselves.[6] Respondents are asked about savings plans which would end after four weeks and savings plans in which they could choose the end date themselves, and we see that more respondents say they would take up the four-week plan across every type of commitment. Given that respondents could say yes to the own-choice-of-date account and then choose four weeks themselves, it seems that respondents could be indicating a preference for pre-designed products perhaps because of uncertainty about how to design timings themselves. Third, respondents interviewed after the onset of the wheat harvest report consistently higher demand than those interviewed prior to the harvest, and this is highly statistically significant in the case of the accounts with both withdrawal and deposit commitments together. This suggests that either liquidity constraints or uncertainty about the harvest yield dampen demand prior to the harvest, and that demand for such products is likely to be higher if they are offered after the harvest. Fourth and finally, regression analysis (not shown) reveals that demand for each of the products is either uncorrelated with self-control problems or is correlated with *not having* a self-control problem (i.e.

[6] Caution is needed in interpreting these results, as the difference between “next four weeks” and “own choice” is never statistically significantly different. However, this may be due to sample size concerns, and the pattern of having more respondents accept the “next four weeks” than the “own choice” version is consistent across all types of commitment.

exhibiting "future-bias"). This leads to further caution in interpreting the demand for commitment savings as arising from simple self-control problems.

Table 1 - Self-reported demand for commitment savings products if offered by NRSP. Numbers in bold are statistically significantly different for respondents interviewed before and after the onset of the wheat harvest.

Type of account	***Deposit commitment only***		***Withdrawal commitment only***		***Withdrawal and deposit commitment***	
Commitment deadline	***Next four weeks***	***Own choice***	***Next four weeks***	***Own choice***	***Next four weeks***	***Own choice***
Take-up (total)	49.9%	42.9%	30.7%	29.0%	27.3%	25.7%
Take-up, pre-harvest	47.1%	39.1%	26.9%	24.9%	**21.1%**	**18.1%**
Take-up, post-harvest	50.2%	43.9%	30.9%	29.7%	**29.2%**	**28.9%**

SUMMARY OF POLICY IMPLICATIONS

Savings providers such as NGOs, banks and governments should think twice before offering commitment savings products to help individuals overcome "self-control" problems. Previous measurements of self-control problems may have been overstated, and may instead reflect the fact that many poor individuals are liquidity-constrained. If apparent measurements of "present-bias" are in fact largely driven by liquidity constraints, then the putative benefits of commitment products in terms of allowing individuals to overcome their own "present-bias" may in fact be smaller than first thought, and may not outweigh the risk of tying up vulnerable individuals' liquidity and thereby reducing their capacity to self-insure against shocks. This may help explain part of the low usage and re-adoption rates for commitment products, alongside imperfect consumer decision-making. [7]

More research should be done about other possible reasons why the poor take up commitment savings products, such as demand for reminders to save and help overcoming "other-control" issues. Indeed, better savings products might be designed which help alleviate issues of inattention and "other-control" issues, but at the same time do not tie up individuals' liquidity such that they are unable to self-insure against shocks.

Savings providers should consider carefully the types of commitment plan that they offer. Our sample report higher demand for contracts with fixed end dates rather than end dates chosen by the consumer. They also report higher demand for softer forms of commitment, although whether this type of soft commitment would actually be strong enough to increase savings is difficult to tell, as individuals may under- or indeed over-estimate the degree of commitment that they actually need.

Once suitable savings products are identified, savings providers should ensure to offer them at suitable times. We find evidence that individuals are considerably liquidity-constrained immediately prior to the harvest, and report being significantly more likely to take up a commitment savings product immediately after the harvest.

OUTPUTS, ACTIVITIES, AND POLICY OUTREACH

The table below details scheduled dissemination activities. In sum: we will disseminate key findings to NRSP national and regional management in the immediate future, as well as presenting to NRSP and other key Pakistani stakeholders at a conference organised by Lahore School of Economics in Spring 2017. We have already presented the preliminary findings at the international conference SEEDEC 2016, which was held in Nairobi, and met with a very positive reception. We also have further conference presentations scheduled in Oxford, as well as invited seminar presentations at both policy institutes and other universities in the UK, and an international workshop presentation in the US. We plan to submit a draft of the academic working paper to various international conferences in development economics in the near future, and to include the working paper in CSAE's online series within twelve months.

Table 2- Planned dissemination activities

Type of activity	Title	Date	Place	Further details / Website
Dissemination of findings to key stakeholders	NRSP, CREB and LUMS	01/09/2016	Islamabad & Sargodha, Pakistan	We plan to share this final report with national and regional management at NRSP in the immediate future, as well as sharing the eventual academic paper.
Conference Presentations	Lahore School of Economics - ESRC conference on microfinance	04/2017	Lahore, Pakistan	Researchers at the Lahore School of Economics are working on several projects in poverty and microfinance and has developed links with PPAF, National Rural Support Programme, Akhuwat and the Pakistan Microfinance Network. The CEOs and representatives of these organisations attended a conference on Microfinance organised by the Lahore School of Economics and University of Oxford on the 16th of April, 2015. They will also be invited in a similar conference in 2017 where we will also present the results of this study.
	SEEDEC	12/07/2016	Nairobi, Kenya	https://seedec2016kenya.com/
	OXDEV	28/10/2016	Oxford, UK	European academic conference
	All Souls Behavioural Colloquium	04/10/2016	Oxford, UK	UK academic conference
	IFS (Institute for Fiscal Studies)	06/10/2016	London, UK	UK policy institute http://www.ifs.org.uk/

Seminar Presentations	Nottingham CREDIT group	19/10/2016	Nottingham, UK	UK academic presentation https://www.nottingham.ac.uk/economics/research/seminars-workshops/credit.aspx
	CSAE Research Workshop	02/11/2016	Oxford, UK	UK academic presentation http://www.csae.ox.ac.uk/
Workshop Presentation	CSAE-CEAR	10/10/2016	Atlanta, USA	International workshop http://cear.gsu.edu/event/2016-cear-csae-eliciting-subjective-beliefs-risk-time-preferences-developing-countries/
Journal article	To be submitted to CSAE Working Paper series	Estimated 31/06/2017	Online	http://www.csae.ox.ac.uk/workingpapers/wps-list.html

Figure 5 - PI Rachel Cassidy presents the research findings at SEEDEC 2016, hosted by the Strathmore School of Business in Nairobi

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