

ELICITING ENTREPRENEURS' PREFERENCES ON CLIMATE RISK MANAGEMENT STRATEGIES. A DISCRETE CHOICE EXPERIMENT WITH MICRO-SIZED ENTERPRISES IN THE PHILIPPINES

The Discrete-Choice-Experiment (DCE) is based on a master's thesis that was carried out in connection with the evaluation of climate change adaptation measures by the German Institute for Development Evaluation (D Eval). This publication contributes to the evaluation module on instruments for managing residual climate risks. The study elaborated on the Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) "relevance" criterion and used a DCE to elicit the perceived value to micro-enterprises in the Philippines of different measures to manage climate risk. Entrepreneurs were offered three theoretical options – improvements in information sharing related to early warning, the development of climate-protective infrastructure, and climate-risk insurance – and their preferences were estimated using a random parameter logit model. The results of this study show that micro-entrepreneurs have strong preferences for the proposed risk-management measures, with the greatest preference identified for climate-risk insurance. It was shown that participation in training on climate risks significantly increases respondents' preference for the presented risk-management measures. Further, enterprises located in urban areas have a higher preference for climate-risk insurance than those located in rural areas. The results of this study were interpreted in terms of willingness to pay (WTP), and compensating variations (CV) for various policy combinations were calculated. The potential gain to entrepreneurs of integrating several policies was found to be large, but highly dependent on the characteristics of the enterprise.

Research Context and Relevance

Micro-enterprises in the Philippines represent a significant part of the Philippine economy and employ more than a quarter of the total workforce (PSA, 2020). These enterprises are highly affected by extreme weather events such as tropical cyclones, as they are often located in high-risk areas and typically have low adaptive capacities (Ballesteros and Domingo, 2015). Their vulnerability may be reduced by measures to manage climate risk – an area that has been receiving increasing attention. Many studies have concluded that individuals have a strong preference for climate-risk insurance, in particular. However, it often remains unclear whether the preferences identified in these studies can be attributed to climate-risk insurance or whether they are more general preferences for measures to manage climate risk (Brouwer et al., 2014).

This leads to the main research question of this study: ***How do micro-entrepreneurs in the Philippines value different measures to manage climate risks and cope with shocks from extreme weather events?***

Since the integration of risk mitigation and risk transfer measures is gaining more and more attention, this study also addresses the following sub-question: ***(a) How do micro-entrepreneurs in the Philippines value integrated strategies to***

manage climate risk and cope with shocks from extreme weather events?

Further, micro-entrepreneurs may not all have the same preference for dealing with climate risks, which leads to another sub-question: ***(b) Do micro-entrepreneurs in the Philippines have different preferences from each other for measures to manage climate risk?***

Lastly, if the preferences of enterprises for climate risk management measures differ, then it is also of great interest which characteristics influence the preferences of the entrepreneurs. This is addressed by the last sub-question: ***(c) Which enterprise characteristics influence the preferences of micro-entrepreneurs in the Philippines for different measures to manage climate risk?***

Research Methodology

Derived from a literature review and from qualitative interviews, this study assessed preferences for three relevant measures: ***(a) improvements in information sharing related to early warning systems, (b) development of climate-protective infrastructure, (c) climate-risk insurance.***

A discrete choice experiment (DCE) was implemented to assess the relative importance and value of these measures for micro-

entrepreneurs in the Philippines. Compared to other stated preference methods, e.g. those in which respondents have to rank or rate certain characteristics, choice experiments in which respondents have to make compromises between alternatives are more realistic, closer to the actual decisions of individuals, and comparatively easy (Lancaster, 1966; Churchill and Matul, 2012; Mangham et al., 2009).

In this study, more than 600 entrepreneurs received six different choice cards. On each card they were asked to choose their preferred option from two hypothetical climate risk management options.¹ An example choice card is depicted in Figure 1.

The options consist of four attributes. Three non-monetary attributes with two levels– *Information*, *Infrastructure*, and *Insurance* – describe the three presented measures for managing climate risk. The ticks (✓) in the columns headed Option A and Option B indicate whether or not a measure is included in the option. A monetary attribute in Philippine Pesos (PHP) – *Price* – with three levels (PHP 50, PHP 100, PHP 150) indicates the monthly cost of each option. Respondents were invited to indicate at the bottom of the card which option they preferred. A status quo option was included in case the respondent did not prefer any of the proposed measures to be implemented under the stated costs.

Figure 2 Example choice card

Product	Option A	Option B
 Information	✓	
 Infrastructure		✓
 Insurance	✓	
 Price	PHP 50	PHP 100
<input type="radio"/> Option A <input type="radio"/> Option B <input type="radio"/> Neither of the two options		

Source: own figure

A short description of the attributes is depicted in Figure 2. This corresponds to the description given to the respondents during the choice experiment. The explanations are quite short in order

¹ The hypothetical attribute combinations were created as follows: First, the 24 possible attribute combinations ($2^3 \times 3^1$) were divided into four blocks of six rows. Afterwards, each block is combined with the other three blocks with the rows paired randomly. Finally, six different variants exist from which one was randomly assigned to each respondent. This experimental design is quiet efficient (D-Efficiency = 83%) and allows to estimate all main and two-way interaction effects.

not to overwhelm the respondents, and use simple wording since it is assumed that most respondents are unfamiliar with the terminology of the subject.

Figure 1 Attribute descriptions

Product	Description
 Information	This product contains better information. For example, evacuation and emergency plans, daily weather information and early warning inform you in case of floods, droughts, and typhoons.
 Infrastructure	This product contains better infrastructure in your barangay. This includes for example better roads, bridges, dams, and drainage.
 Insurance	This product contains an insurance. In case of impacts from floods, droughts, and typhoons, your enterprise obtains a payment.
 Price	Total cost for your enterprise per month for the implementation of your chosen option, which can comprise zero, one or multiple products.

Source: own figure

The data was collected through face-to-face interviews, with the interviewers elaborating on the description, if necessary. The three non-monetary attributes were broadly defined. The insurance system was not explained in detail to respondents, nor were specific policy measures mentioned to respondents in the other attributes.

This approach provides information on the global preferences of entrepreneurs so that policy-makers can, later on, choose which specific intervention to implement in a local context (Crastes et al., 2014). The study tools were pre-tested, leading to a refinement of attributes, choice cards, and descriptions.

Survey Area and Data Collection

The choice experiment was embedded in an overall enterprise survey conducted by DEval to analyse Philippine–German cooperation in the context of climate risks.² The survey took place in five municipalities located in four provinces in the Philippines, selected as pilot regions by Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) (2019) to promote climate-risk insurance (Las Nieves, Agusan Del Norte; Catarman, Northern Samar; Malungon, Sarangani; Irosin, Sorsogon; Cabadbaran, Agusan Del Norte).³ The survey was conducted in English and three regional languages (Bicolano,

² The ethical approval for the survey was obtained through a local research agency. Besides, each participant was informed about the study and has given informed consent before participating in the survey.

³ Previously, Isabela was selected as the fifth survey municipality. However, data collection was not possible due to physical accessibility restrictions. Instead, Cabadbaran was added, as it was also on the GIZ selection list.

Cebuano, Waray). Within each municipality, various barangays⁴ with a high number of enterprises were selected. It was required that all enterprises included in the survey were registered – that they had a barangay permit. The focus was on enterprises in rural areas, such that in each municipality one urban and five rural barangays were randomly selected.⁵ Within each barangay, the enterprises were selected based on a so-called “random walk”, where the starting point was the barangay hall, health centre or school.⁶ Finally, 125 interviews were conducted in each municipality, between January and February 2020, resulting in a total of 625 interviews.⁷

Data Cleaning

Following the data collection, the sample was reduced to respondents who were the main decision maker in the enterprises, and to micro-enterprises with fewer than 10 employees and assets below PHP 3 million.⁸ So-called “protest responses” were identified and also removed from the survey. Protest behaviour occurs when respondents who reject or disagree with the survey do not respond, make invalid but positive choices, or give a zero rating to a good for which they have positive or negative preferences. If protest responses are not identified and the respondents excluded from the sample, the results of the study may be misinterpreted (Halstead et al., 1992).

First, respondents were identified who opted for the status quo alternative two or more times, referred to as *serial non-participants* (von Haefen et al., 2005: 1). These respondents received a follow-up question on their motives behind it. Respondents who either stated that they did not feel responsible for paying for climate-risk management, or assumed that the money would be used for other purposes, or stated that they did not understand the choice experiment were considered as protest respondents and therefore excluded from the sample (Craates et al., 2014). At the end of the data cleaning, 586 respondents were left in the final sample.

Statistical Analysis

A random parameter logit (RPL) model was conducted to analyse the experimental data. This model is an extension of the simple multinomial logit (MNL) model, allowing the parameters to vary randomly over individuals by assuming some a priori parameter distribution. The model thereby accounts for the panel structure of the data and captures everything that is constant across individuals’ choices but varies across individuals. Moreover, compared to the MNL model, the RPL model does not rely on the “independence of irrelevant alternatives” (IIA) assumption (Croissant, 2012). The estimated coefficients of the RPL model cannot be interpreted directly, as is the case in linear models, and only the sign of the alternative specific variables can be interpreted. Therefore, the coefficients were interpreted in terms of willingness to pay (WTP), which also makes it possible to evaluate the value that the management measures have for the respondents in monetary terms. The WTP estimate is obtained as the ratio of the non-monetary attribute coefficient over the price coefficient (Train, 2009: 40–42). Allowing both the non-monetary and the monetary parameter to vary randomly across individuals may lead to undefined distributions.⁹ Therefore, the price coefficient is held fixed while the other parameters are assumed to be normally distributed. As it is unrealistic to assume that respondents’ preferences for the price attribute are equal, the interaction terms *Price x Employees*, *Price x Gender*, *Price x Investment* were included (Craates et al., 2014). Furthermore, to investigate the sources of heterogeneity for the non-monetary attributes, further interaction terms between the non-monetary attributes and enterprise characteristics were included (see Table 1 for a variable description). An “alternative specific constant” (ASC) is included in the model specification to capture the effect of all variables not included in the model influencing the preference for departing from the status quo. It equals 1 if a non-status quo option is chosen, 0 otherwise. Standard errors are simulated using the delta method. Lastly, compensating variations (CVs) were calculated to measure the effect of a policy change (changes in one or multiple attributes) on respondents’ utility.

⁴ A barangay is the lowest level in the administrative structure in the Philippines, similar to a village or town district.

⁵ The rural–urban classifications were derived from the 2015 Census of Population and Housing (PSA, 2019). Since there are only rural barangays in the municipality of Las Nieves, only rural barangays could be randomly selected.

⁶ Since barangay borders partly merge into each other, some barangays have been added. More precisely, when the random walk was completed in one barangay, the interviewer continued in the next barangay.

⁷ During data collection, the local research agency also carried out quality control and data cleaning. Interviews were conducted until 125 interviews were available in each study

area that met the specified criteria. For example, interviews that were completed unusually quickly were replaced. Back-checking of the interviews was also carried out.

⁸ This corresponds to the definition of micro-enterprises from the Philippines Statistics Authority (DTI, 2018).

⁹ For example, the distribution of the ratio of two normally distributed random variables is undefined.

Table 1 Descriptive statistics

Variable	Code	Mean	Min	Max	Median	SD	N
Gender ¹⁰	1=male, 0=female	0.19	0	1	0	0.4	586
Employees	Continuous	1.47	1	8	1	0.84	586
Investment	1 = any investments in the past 12 months, 0 otherwise	0.89	0	1	1	0.31	586
Training	1 = participation in any training on climate risks, 0 otherwise	0.42	0	1	0	0.49	582
Urban	1 = urban, 0 = rural	0.27	0	1	0	0.44	586
Impact	1 = exposed to any climate risk with medium or high impact since 2017, 0 otherwise	0.72	0	1	1	0.45	586
Insurance literacy	1 = mostly or completely informed about insurance, 0 otherwise	0.52	0	1	1	0.5	586
Income	Continuous ¹¹	819.36	5	54000	360	2562	582

Source: own table

Results

Table 2 shows the RPL (column 1) and the WTP estimates (column 2).¹² The coefficient of the ASC in column 1 is positive and significant, suggesting that entrepreneurs are, on average, willing to depart from the status quo to better adapt their enterprises to climate risks. For the random variables, the estimated means and standard deviations are depicted. As expected, the means of the parameter estimates show that the presence of a stated non-monetary attribute significantly increases the probability of selecting an alternative, while a higher price decreases it, keeping all other attributes constant. The parameter estimates cannot be interpreted directly but can be compared in magnitude. The coefficient of *Insurance* is the largest, followed by *Infrastructure* and lastly by *Information*. The standard deviations indicate that there is substantial latent heterogeneity in entrepreneurs' preferences, since the coefficients *Information.SD* and *Insurance.SD* are highly significant. This justifies the use of an RPL model.¹³

The parameter estimate on *Gender* is positive and significant at a 5% significance level. This result indicates that male respondents are, on average, willing to pay more for climate-risk management. Similarly, the interaction variable between *Price* and *Investment* is significant at a 1% significance level, indicating that enterprises that have made any investments in the last 12 months have a higher mean WTP.

Lastly, there is no clear evidence that the number of employees influences the WTP, as the variable *Employees* is not significant. To investigate the source of heterogeneity in the non-monetary

attributes, two-way interaction terms were introduced. The findings show that enterprises that have participated in any training (e.g. informational event or workshop) on climate risks have higher preferences for the proposed measures to manage climate risk. Furthermore, the findings indicate that the impact of past extreme weather events has no significant heterogeneous effect on respondents' preferences. Lastly, the results show that respondents living in urban regions have higher preferences for climate-risk insurance. No significant differences in preferences are detected from the two interaction terms: *Information x Urban* and *Infrastructure x Urban*.

The WTP estimates in column 2 of Table 2 show that respondents are, on average, willing to pay PHP 132.26 per month to depart from the status quo. The mean WTP values vary greatly and significantly, depending on enterprise characteristics. For example, enterprises that have participated in any training are, on average, willing to pay PHP 42.40 more for the development of protective infrastructure, compared with respondents who did not participate in any training. Furthermore, enterprises located in urban areas are, on average, willing to pay PHP 46.73 more for climate-risk insurance.

¹⁰ No respondent identified themselves as non-binary.

¹¹ Net income in the last fiscal year is calculated as gross income minus expenses. The values are given in hundreds of PHP.

¹² The results of the DCE seem to be very robust regarding model specifications and sample selection. Different statistical models were estimated and their results did not differ substantially. The RPL model reported in this work is the one that performs best in terms of AIC and the BIC. Moreover, neither the inclusion of those respondents who have been identified to give protest responses nor restricting the sample to any subgroup substantially changed the results.

¹³ Furthermore, a Likelihood Ratio (LR) test is applied to the simple MNL model and the RPL model and the null hypothesis of no random effects can be rejected (χ^2 (df=15)=142.71; $p<0.0001$).

Table 2 Regression results

Variables	RPL Estimates		WTP Estimates	
	Coefficient	S.E.	Coefficient	S.E.
ASC	1.752	0.185	132.360***	11.780
<i>Main Effects</i>				
Price	-0.026***	0.003		
Information	1.079***	0.249	81.530***	19.260
Infrastructure	1.460***	0.172	110.329***	15.178
Insurance	3.782***	0.422	285.741***	35.645
<i>Latent Heterogeneity</i>				
Information.SD	1.413***	0.295	106.783***	22.879
Infrastructure.SD	0.025	0.426	1.894	32.212
Insurance.SD	2.875***	0.402	217.206***	30.828
<i>Observed Heterogeneity</i>				
Price x Employees	0.001	0.001		
Price x Gender	0.005*	0.002		
Price x Investment	0.012***	0.002		
Information x Training	0.576*	0.224	43.484*	17.191
Information x Urban	0.060	0.243	4.518	18.389
Information x Impact	0.015	0.243	1.119	18.359
Infrastructure x Training	0.561***	0.156	42.398***	12.399
Infrastructure x Urban	-0.163	0.168	-12.340	12.735
Infrastructure x Impact	-0.153	0.166	-11.594	12.579
Insurance x Training	0.644**	0.229	48.674**	17.535
Insurance x Urban	0.618*	0.259	46.716*	19.681
Insurance x Impact	-0.290	0.249	-21.926	18.853

Note: N= 582¹⁴, AIC 3733.202, BIC 3856.366. *, **, *** indicate significance levels of 0.05, 0.01, and 0.001 respectively. The maximum likelihood simulation is based on 1000 random draws.

Source: own table

Table 3 provides CV measures for changes in management of climate risk. Since no consensus could be found in the literature, the CV measures were calculated twice: once including and once excluding the ASC. The mean CV for the hypothetical single management policies *Information*, *Infrastructure*, and *Insurance* are PHP 101.86 (PHP 234.22), PHP 116.46 (PHP 248.82), and PHP 302.96 (PHP 435.32) respectively, relative to the status quo when excluding (including) the ASC. Thus, micro-enterprises value climate-risk insurance twice as much as the other measures. The mean CV for a hypothetical fully integrated management policy amounts to PHP 521.99 (PHP 653.65).¹⁵

Table 3 Compensating variation

Management policy	ASC=0	ASC=1
<i>Single management policy</i>		
Information	101.86	234.22
Infrastructure	116.46	248.82
Insurance	302.96	435.32
<i>Fully integrated management policy</i>		
Information, Infrastructure, Insurance	521.29	653.65

Source: own table

Limitations

There are some limitations with DCEs, and possible sources of error that could affect the internal or external validity of the results. For example, there may be inaccuracies in the model estimates due to further benefits beyond the benefits of managing climate risks (e.g. more reliable supply chains through infrastructure improvements), which would lead to underestimated WTP estimates (Westerberg et al., 2010). Furthermore, even if care was taken to avoid a hypothetical bias by using a specific wording, it cannot be completely excluded that no mismatch exists between the choices made in this choice experiment and the choices made when being confronted with real consequences, which would lead to overestimated WTP estimates (Kanninen, 2007). Besides, improvements in the information system related to early warning systems, and especially to the development of climate-protective infrastructure, might be considered as common goods. As people often have higher preferences for private goods than for common goods, this could explain parts of the lower WTP estimates (Svensson and Vredin Johansson, 2010). Therefore, the WTP estimates need to be cautiously considered.

¹⁴ The sample size shrank to 582 respondents due to refused answers in some supporting questions.

¹⁵ As the attributes were only broadly defined, the WTP estimates should not be used to derive insurance premiums. More research should therefore be carried out before

implementing specific policies in order to assess WTP for, or the benefits of, these policies at local level.

Discussion & Conclusion

There is evidence in the literature that measures to manage climate risk are very important for increasing the resilience of the population affected by climate risks and that there is a high demand for these measures among the population. **The results of this study confirm that measures to manage climate risk are considered highly relevant by those running micro-enterprises in the Philippines.**

Many studies have concluded, in particular, that individuals have a strong preference for climate-risk insurance. However, there is a lack of knowledge as to whether this preference can be attributed solely to climate-risk insurance or whether the respondents have a preference for measures to manage climate risk in general. This also means that for the target population the relative importance of different measures to manage climate risk is unknown. Thus, the goal of this study was to provide evidence on how micro-entrepreneurs in the Philippines value different measures for managing climate risks and for coping with shocks from extreme weather events. The findings of this study indicate that entrepreneurs value climate-risk insurance above other measures, followed by the development of climate-protective infrastructure, and, finally, improvements in information sharing related to early warning. **Although climate-risk insurance is seen as particularly important, only a minority of enterprises so far have insurance.**¹⁶

Considerable heterogeneity in preferences among entrepreneurs was observed. Training on climate risks significantly increases respondents' preferences for all the proposed measures to manage climate risk. This finding is in line with recommendations derived from the special report of the IPCC (2012: 17) on managing climate and disaster risks, which stated that risk communication is essential for climate risk management. **Therefore, climate risk-awareness campaigns might lead to a higher acceptance of climate risk management measures.**

Furthermore, the results show that entrepreneurs working in enterprises located in urban areas have higher preferences for climate-risk insurance than those working in enterprises located in rural areas. As respondents in rural areas indicated on average that they are less informed about insurance, this could explain part of their lower preference for this measure.¹⁷

Comprehensive financial literacy training prior to the implementation of climate-risk insurance could increase demand for it.

Existing studies found that exposure to past flood events positively influences the demand of individuals for flood insurance. Therefore, this study also investigated whether past exposures to extreme weather events influence the preferences of entrepreneurs. **This study could not confirm that respondents' preferences for the given risk-management measures depend on the effects of past extreme weather events.**

In addition, the findings show that enterprise characteristics influence respondents' WTP. Enterprises that arranged any investment in the past 12 months are significantly more willing to pay for measures to manage climate risk. This is not surprising, as past investment behaviour is a good predictor for future investment behaviour (Ajzen, 1991: 202). Moreover, male respondents seem to be, on average, more willing to pay for climate risk management. This result could partly be explained by differences in the ability to pay, as the average enterprise of a female respondent has a significant lower net income than the average enterprise of a male respondent.¹⁸ The number of employees was not found to significantly influence respondents' WTP. This is not surprising considering that the number of employees in this survey hardly differed.¹⁹ Lastly, this study focused on the analysis of the integration of different climate-risk mitigation and risk-transfer measures. **The findings of this work indicate that, on average, enterprises are willing to pay at least PHP 521.29 per month for a hypothetical fully integrated policy to manage climate risk compared to the status quo, which is equivalent to 7.64% of the mean net income.**

In conclusion, the results of this study complement the literature by showing the relative importance of measures to manage climate risks for micro-enterprises, taking into account enterprise characteristics. In this way, they provide policy-makers with some indication of how to adapt their strategies to the needs of micro-enterprises. Further, the study provides evidence that choice experiments are a promising instrument in climate and entrepreneurial research.

¹⁶ Fewer than 5% of enterprises stated that they were insured against climate risks.

¹⁷ A Pearson's chi-squared test run between Urban and Insurance Literacy was found to be highly significant (χ^2 (df=1)=288.09; $p<0.001$).

¹⁸ The parametric one-way analysis of variance (ANOVA) test run between Income (logarithmic) and Gender was found to be significant at a 1% significance level ($F(1; 10330)=9.315$; $p<0.01$).

¹⁹ Only 32% of the enterprises have more than one employee and 97% of all enterprises have up to three employees.

Authors

Ann-Kristin Becker (University of Cologne)
Dr Gerald Leppert (DEval)

Based on

Ann-Kristin Becker (2021), Eliciting entrepreneurs' preferences on climate risk management. A discrete choice experiment with micro-sized enterprises in the Philippines. Unpublished master thesis, *University of Cologne*, Cologne, Germany.

References

Ajzen, I. (1991), "The theory of planned behavior", *Organizational Behavior and Human Decision Processes*, Vol. 50/2, pp. 179–211.

Ballesteros, M. M. and S. N. Domingo (2015), "Building Philippine SMEs resilience to natural disasters", *PIDS Discussion Paper Series*, No. 2015–20, p. 49.

Brouwer, R. et al., (2014), "Modeling demand for catastrophic flood risk insurance in coastal zones in Vietnam using choice experiments", *Environment and Development Economics*, Vol. 19/2, pp. 228–249. doi: 10.1017/S1355770X13000405.

Churchill, C. and M. Matul (2012), "Protecting the poor – A microinsurance compendium," International Labour Organisation, Geneva.

Crastes, R. et al. (2014), "Erosive runoff events in the European Union: Using discrete choice experiment to assess the benefits of integrated management policies when preferences are heterogeneous", *Ecological Economics*, Vol. 102, pp. 105–112.

Croissant, Y. (2012), "Estimation of multinomial logit models in R: The Mlogit Packages", *R Package Version 0.2-2*.

DTI (2018), "Defining Philippine micro, small and medium enterprises (MSMEs)", <https://dtiwebfiles.s3-ap-southeast-1.amazonaws.com/e-library/Growing+a+Business/MSME+Statistics/2018/2018+Philippine+MSME+Statistics+in+Brief.pdf> (accessed 20 May 2020).

GIZ (2019), "Regulatory framework promotion of pro-poor insurance markets in Asia (RFPI Asia III). Promoting climate risk insurance in three Southeast Asian countries", Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Makati City.

Halstead, J. M. et al. (1992), "Protest bidders in contingent valuation", *Northeastern Journal of Agricultural and Resource Economics*, Vol. 21/2, pp. 160–169.

IPCC (2012), *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation: A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change*, C. B. Field, V. Barros, T. F. Stocker, D. Qin, D. J. Dokken, K. L. Ebi, M. D. Mastrandrea, et al., Eds., Cambridge University Press, Cambridge/New York, doi:10.1017/CBO9781139177245.

Kanninen, B. J. (2007), *Valuing Environmental Amenities Using Stated Choice Studies: A Common Sense Approach to Theory and Practice*. Springer.

Lancaster, K. J. (1966), "A new approach to consumer theory." *Journal of Political Economy*, Vol. 74/2, pp. 132–157. doi:10.1086/259131.

Mangham, L. J. et al. (2009), "How to do (or not to do)... Designing a discrete choice experiment for application in a low-income country," *Health policy and planning*, Vol. 24/2, pp. 151–158.

PSA (2019), "Urban population in the Philippines (Results of the 2015 Census of Population)", Philippine Statistics Authority.

PSA (2020), "2018 MSME Statistics", <https://www.dti.gov.ph/resources/msme-statistics/> (accessed 13.06.2020).

Svensson, M. and M. Vredin Johansson (2010), "Willingness to pay for private and public road safety in stated preference studies: Why the difference?", *Accident Analysis & Prevention*, Vol. 42/4, pp. 1205–1212.

Train, K. E. (2009), *Discrete Choice Methods with Simulation*, Cambridge University Press, 2nd ed.

Westerberg, V. H. et al. (2010), "To Restore or not? A valuation of social and ecological functions of the Marais Des Baux Wetland in Southern France", *Ecological Economics*, Vol. 69/12, pp. 2383–2393.

Wouter Botzen, W. J. and J. C. Van Den Bergh, J. C. (2012), "Monetary valuation of insurance against flood risk under climate change." *International Economic Review*, Vol. 53/3, pp. 1005–1026. doi:10.1111/j.1468-2354.2012.00709.x

Acknowledgements

We thank Dr Cornelia Römling, Dr Martin Noltze and Kevin Moull, who supported the implementation of the discrete choice experiment in the Philippines, as well as Alexandra Köngeter and Dr Johannes Schmitt, who supported the survey of qualitative interviews in Morocco. Moreover, special thanks go to Professor Dr Pia Pinger from the University of Cologne for her great support in supervising the master thesis.

The German Institute for Development Evaluation (DEval) is mandated by the German Federal Ministry for Economic Cooperation and Development (BMZ) to independently analyse and assess German development interventions. Evaluation reports contribute to the transparency of development results and provide policy-makers with evidence and lessons learned, based on which they can shape and improve their development policies.