ONLINE APPENDIX

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Yuze Xia, Northwestern University, Kellogg School of Management Jingui Xie, Technical University of Munich Wen Xie, City University of New York, Baruch College Feiyu Xu, Hong Kong University of Science and Technology Luze Xu, University of California Davis Sikun Xu, Washington University in St. Louis Simon Xu, Harvard University, Harvard Business School Yilong Xu, Utrecht University School of Economics, Utrecht University Rui Xue, La Trobe University Beril Yalcinkaya, University of Maryland Ruijing Yang, Chinese University of Hong Kong Yadi Yang, Nanjing Audit University Huang Yao, Central South University, Business School; Hunan Agricultural University, College of Economics Shiqing Yao, Monash University Yaojun Ke, Nanyang Technological University Ozge Yapar, Indiana University, Kelley School of Business Eduard Yelagin, University of Memphis Ira Yeung, University of British Columbia Erdem Dogukan Yilmaz, Erasmus University Rotterdam Levent Yilmaz, Turkish-German University Woongsun Yoo, Central Michigan University Simon (Seongbin) Yoon, University of California Irvine Sora Youn, Texas A&M University Alex Young, Hofstra University Jin Yu, Monash University Jungju Yu, Korea Advanced Institute of Science and Technology Junhao Vincent Yu, Miami University, Farmer School of Business Lizi Yu, University of Queensland Huaiping Yuan, The Chinese University of Hong Kong-Shenzhen, SME and SFI Yuan Yuan, Purdue University Lei Yue, University of California Santa Barbara Anita Zednik, Vienna University of Economics and Business Yasser Zeinali, University of Alberta Shenghui Zhai, University of the Chinese Academy of Sciences Xintong Zhan, Fudan University Aiqi Zhang, Wilfrid Laurier University, Lazaridis School of Business and Economics

Chengyu Zhang, McGill University

Huanan Zhang, University of Colorado Boulder

Huanren Zhang, University of Southern Denmark

Hulai Zhang, Tilburg University; ESCP Business School

Jack H. Zhang, Nanyang Technological University

Le (Lyla) Zhang, Macquarie University

- Quan Zhang, Nanyang Technological University
- Renyu Zhang, Chinese University of Hong Kong
- **Ruishen Zhang**, Shanghai University of Finance and Economics
- **Shu Zhang**, Shanghai University of Finance and Economics

Sili Zhang, Ludwig-Maximilians-Universität München

Walter W. Zhang, University of Chicago, Booth School of Business

- Zhiqi Zhang, Washington University in St. Louis, Olin Business School
- Jiayu (Kamessi) Zhao, Massachusetts Institute of Technology, Operations Research Center
- Xiaofei Zhao, Georgetown University
- Zhongyu Zhao, University of Hong Kong

Jiakun Zheng, Renmin University of China, School of Finance

Yaping Zheng, McGill University

Zhanzhi Zheng, University of North Carolina at Chapel Hill, Kenan–Flagler Business School

Aner Zhou, San Diego State University

Hongyi Zhu, University of Texas at San Antonio

Jason Zhu, Microsoft

Yayongrong Zhu, University of Queensland

Christian Zihlmann, University of Fribourg, Berne Business School

Marius Zoican, University of Toronto

Ro'i Zultan, Ben-Gurion University of the Negev

Zhuan Zuo, University of the Chinese Academy of Sciences

B Additional tables and figures

	Has Report $(N = 459)$	No Report $(N = 30)$
Stata	60.1%	43.3%
R	19.2%	23.3%
Matlab	17.9%	26.6%
SAS	12.9%	13.3%
Python	10.7%	13.3%
Mathematica	1.7%	6.7%
SPSS	1.3%	0.0%
Other	5.7%	13.3%

TABLE B.1: SOFTWARE USED IN ARTICLES WITH AND WITHOUT REPORT

TABLE B.2: Reasons for non-reproducibility for articlesWITH REPLICATION PACKAGE, BY POLICY

,		
	Before 2019 policy	Since 2019 policy
	(N = 18)	(N = 136)
No access to dataset.	61.1%	88.2%
Issues with software/hardware requirements.	5.6%	2.9%
Code or parts of code/functions missing.	55.6%	12.5%
Insufficient documentation, missing information.	11.1%	7.4%
Unresolvable errors when executing code.	11.1%	5.1%
Reproduction yields (partly) different results.	11.1%	4.4%

		Lab/online experiment	Theory /Simulation /Computation	Survey study	Field experiment	Empirical data
SMS	(N = 5)	0	100	0	0	0%
BDE	(N = 66)	70	3	5	8	15%
ENI	(N = 10)	10	0	0	0	90%
RMA	(N = 19)	0	84	0	0	16%
ACC	(N = 57)	7	0	2	0	91%
OPM	(N = 38)	11	32	5	11	42%
OPT	(N=6)	0	100	0	0	0%
BDA	(N = 14)	0	100	0	0	0%
FIN	(N = 124)	5	15	1	1	78%
HCM	(N = 16)	0	19	0	0	81%
INS	(N = 19)	0	11	5	11	74%
MKG	(N = 20)	10	5	0	15	70%
ORG	(N = 13)	0	8	8	0	85%
BST	(N = 12)	0	8	8	25	58%
Total	(N = 419)	15	20	2	4	59%

TABLE B.3: DISTRIBUTION OF ARTICLE TYPES/METHODS FOR EACH JOURNAL DEPARTMENT, SINCE 2019 POLICY

Note: Department acronyms are SMS: Stochastic Models and Simulations, BDE: Behavioral Economics and Decision Analysis, ENI: Entrepreneurship and Innovation, RMA: Revenue Management and Market Analytics, ACC: Accounting, OPM: Operations Management, OPT: Optimization, BDA: Big Data Analytics/Data Science, FIN: Finance, HCM: Healthcare Management, INS: Information Systems, MKG: Marketing, ORG: Organizations, BST: Business Strategy.

C ROBUSTNESS ANALYSES

In Tables C.1 and C.2 we replicate our main results reported in Section III (Figure 1 and Table 4) based on different samples from the set of all submitted reports. In Table C.1, as a "lower" bound we report the distribution of overall assessments when using the lower assessment whenever we have obtained two reports for an article. As a randomized approach ("rand."), we report the distribution of assessments which we obtain when simulating 10,000 replications of the dataset, in each of which one report is randomly selected when multiple reports are available. The "upper" bound is represented by the case where we select the higher assessment whenever we have two reports for an article (as reported in Figure 1).

The first three result columns in Table C.1 only consider reports for verifiable articles (i.e., where data was available if needed, and soft- and hardware requirements were met) that were subject to the 2019 disclosure policy. The second set of three columns also includes reports for non-verifiable articles, and the third set focuses on reports on articles that were accepted before the disclosure policy was introduced and voluntarily provided replication materials.

Differences between the three approaches to aggregating multiple reports (lower bound, randomized, upper bound) are in the expected direction but small in size. Compared to taking the higher overall assessment with a share of fully or largely reproduced articles of 95.3% for verifiable articles, this number is 91.4% when taking the lower assessment, and 93.8% when randomizing which of two assessments is considered. Similarly, the numbers for all assessed articles and articles from before the 2019 policy change do not vary much.

The regressions reported in Table C.2, assessing the disclosure policy effect at the report level while clustering standard errors at the article level to account for multiple reports per article, replicate our results at the article level (reported in Table 4 in the main text).

TABLE C.1: ROBUSTNESS CHECKS ON OVERALL ARTICLE REPRODUCIBILITY ASSESSMENTS

	Since 2019 policy, verifiable articles (N = 297)		Since 2019 policy, all assessed articles (N = 419)		Before 2019 policy, all assessed articles (N = 40)				
	lower	rand.	upper	lower	rand.	upper	lower	rand.	upper
Not verifiable				29.4%	26.7%	23.9%	15.0%	12.5%	10.0%
Largely not verifiable				6.4%	6.0%	5.3%	17.5%	17.5%	17.5%
Not reproduced	4.5%	3.0%	2.0%	2.9%	2.0%	1.4%	10.0%	10.0%	10.0%
Largely not reproduced, with major issues	4.1%	3.2%	2.7%	2.6%	2.2%	1.9%	10.0%	8.8%	7.5%
Largely reproduced, with minor issues	68.4%	60.1%	52.2%	43.9%	40.5%	37.0%	37.5%	35.0%	32.5%
Fully reproduced	23.0%	33.7%	43.1%	14.8%	22.7%	30.5%	10.0%	16.2%	22.5%
Fully or largely reproduced	91.4%	93.8%	95.3%	58.7%	63.2%	67.5%	47.5%	51.2%	55.0%

Note: The percentage values in columns "lower" ("upper") are the result of only considering the more negative (positive) report in case there are two reports for the same article. The "upper" columns thus correspond to the results in Figure 1 in the main text. The values in columns "rand." are the result of 10,000 replications in each of which one report was randomly selected when there are two reports for the same article.

TABLE C.2: REGRESSING REPRODUCIBILITY ON DISCLOSURE POLICY EXISTENCE, REPORT LEVEL

Model Sample of articles	(All incl. 1	1) no package	(: All with	2) package	(3 All ver	3) rifiable
	Coeff	StdErr	Coeff	StdErr	Coeff	StdErr
Constant	0.098***	(0.020)	0.547***	(0.077)	0.778***	(0.069)
Policy	0.526***	(0.031)	0.077	(0.081)	0.159^{**}	(0.070)
Report observations \mathbb{R}^2	1,0 0.2	045 251	75 0.0	53)02	50 0.0)4)29

Note: The dependent variable is a binary indicator whether the article was classified as "fully reproduced" or "largely reproduced", or not. Standard errors are clustered at the article level. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

In addition to an overall assessment, we asked our reviewers to provide individual assessments for each table and figure in the article that are based on code and/or data analysis, and a summary assessment of other analyses reported in the manuscript (that is, how many of those results they could reproduce). Many reviewers did so, but not all. Some articles only included figures and/or tables that were not based on code or data analysis. As a result, the sample size in terms of articles is slightly lower for this analysis.

Table C.3 shows that, as to be expected, overall assessments and individual assessments are highly correlated. If an article was overall classified as "Fully reproduced," then more than 99% of tables and figures and more than 92% of other results could be reproduced. If an article was overall classified as "Not reproduced," the shares of reproduced tables, figures, and other results are 3%, 8%, and 25%, respectively.

	Tables $(N = 374)$	Figures $(N = 301)$	Other Results $(N = 145)$
Fully reproduced	99.1 $\%$	$99.7 \ \%$	$92.3\ \%$
Largely reproduced with minor issues	86.6 $\%$	84 9 %	$63\ 4\ \%$
Largely not reproduced, with major issues	12.0%	30.5%	0.0%
Not reproduced	2.7%	7.5%	23.7 %

TABLE C.3: Share of tables, figures, and other results assessed as at least largely reproducible, by overall reproducibility assessment, since 2019 policy

Figures C.1, C.2, and C.3 show the distribution of assessment outcomes for tables, figures, and other results, respectively, for different samples. The first panel of each figure displays the distributions over all tables, all figures, and all other results, respectively. To account for the fact that articles differ substantially in the number of included tables and figures, for the second panel of each figure we first calculate the distribution of assessment outcomes for each article (using the report with the higher overall assessment, as above), and then average over all articles. In the third panel, we only consider articles which have been deemed verifiable (i.e., for which the dataset was available to the reviewer and soft- and hardware requirements could be met).

We find that it makes little difference how we aggregate individual results, in particular for tables and figures. The share of at least largely reproduced tables is 58-62% (depending on the aggregation method) for all articles, and 88% when considering verifiable articles only. For figures, these shares are 68-70% for all articles and 90% for verifiable articles. For other results we only distinguish between reproducible and not reproducible and results are based on a smaller sample (not all articles report other results, and not all reviewers assessed other results). The respective numbers here are 66-83% for all articles and 75% for verifiable articles.



FIGURE C.1: REPRODUCIBILITY ASSESSMENTS OF TABLES, SINCE 2019 POLICY
Not reproduced Largely not reproduced Largely reproduced, with minor issues Fully reproduced

FIGURE C.2: REPRODUCIBILITY ASSESSMENTS OF FIGURES, SINCE 2019 POLICY
Not reproduced Largely not reproduced Largely reproduced, with minor issues Fully reproduced



FIGURE C.3: REPRODUCIBILITY ASSESSMENTS OF OTHER RESULTS, SINCE 2019 POLICY
Not reproduced
Reproduced



D REVIEWER CONSISTENCY

For articles for which we were able to obtain two reviews, Table D.1 displays the assessments of the reviewer with the higher assessment and the second reviewer (with the same or lower assessment). Among the 120 reviewer pairs with different assessments, the reviewer with the lower assessment of reproducibility rated the straightforwardness of the reproduction lower (avg. of 71.7 vs. 80.9 on a scale 0-100, p < 0.001), was (weakly significantly) less likely to rate the readme file as sufficient (p = 0.063), and rated their own methodological expertise as lower (avg. of 80.9 vs. 84.8 on a scale 0-100, p < 0.001). No differences between reviewers with lower and higher rating were found with respect to time spent on the review (9.2 vs. 10.4 hours, p = 0.478), and for their self-assessed expertise in the topic of the article (p = 0.842).

	Review	wer with (weakly) higher	assessment
Reviewer with (weakly) lower assessment	Fully	Largely	Largely not	Not
Fully reproduced.	31			
Largely reproduced, with minor issues.	64	65		
Largely not reproduced, with major issues.	5	20	8	
Not reproduced.	2	13	16	70

TABLE D.1: REVIEWER CONSISTENCY

E PROJECT DOCUMENTATION

E.1 Reviewer Invitation Emails

Invitation email to Management Science reviewers

Dear First Name,

As you may know, recently Management Science initiated the Management Science Reproducibility Project (ManSciReP). In this project, we assess the computational reproducibility of studies published in the journal. Since 2020, the Code & Data Editor verifies that replication materials are provided but does not attempt reproduction itself. In this project, we aim to quantify the reproducibility of results published in Management Science articles before and after the new Data and Code Disclosure Policy came into effect.

I am writing to see if you would be willing to review a replication package of a paper recently accepted for publication in Management Science. You are receiving this email because you have served as a reviewer for Management Science before.

If you are willing to review, we would assign you a paper from your own field of research, and using software that you are familiar with. We would then ask you to report back within 4-6 weeks to what extent you were able to reproduce the paper's main results, and what the obstacles were.

This call for reviewers is open to any researcher in the community, including advanced Ph.D. students. Please feel free to forward this call to colleagues and students.

All participating reviewers who submit a report will become members of a "consortium co-authorship" for the final publication that reports the outcomes of the project. This consortium, the "Management Science Reproducibility Collaboration," will be listed as a co-author on the front page of the article, with all members listed by name and affiliation in the paper's appendix.

If you are willing to participate as a reviewer, we ask you to complete this short survey (before January 15, 2023), so we can match you with a paper from your field.

Begin Survey

In case of any questions, please contact the project team at ManSciReP@informs.org.

Sincerely, David Simchi-Levi Editor-in-Chief, Management Science

Invitation email to others

Dear Researcher:

We would like to draw your attention to an opportunity to join a new project on the reproducibility of studies published in Management Science as a reviewer.

In the Management Science Reproducibility Project (ManSciReP), we assess the computational reproducibility of studies published in the journal. Since 2020 the Code & Data Editor verifies that replication materials are provided but does not attempt reproduction itself. In this project, we aim to quantify the reproducibility of results published in Management Science articles before and after the new Data and Code Disclosure Policy came into effect.

If you would be willing to review, we would assign you a paper from your own field of research, and using software that you are familiar with. We would then ask you to report back within 4-6 weeks to what extent you were able to reproduce the paper's main results, and what the obstacles were.

This call for reviewers is open to any researcher in the community, including advanced PhD students. Please feel free to forward this call to colleagues and students.

All participating reviewers who submit a report will become members of a "consortium co-authorship" for the final publication that reports the outcomes of the project. This consortium, the "Management Science Reproducibility Collaboration", will be listed as a co-author on the front page of the article, with all members listed by name and affiliation in the paper's appendix.

If you are willing to participate as a reviewer, we ask you to complete this short survey, so we can match you with a paper from your field. Survey link

In case of any questions, please contact the project team at ManSciReP@informs.org.

Sincerely,

David Simchi-Levi Editor-in-Chief, Management Science

Miloš Fišar, Ben Greiner, Christoph Huber, Elena Katok, and Ali Ozkes Project coordinators

E.2 Reviewer registration survey

Management Science Reproducibility Project

Reviewer registration form

The Management Science Reproducibility Project (ManSciReP) assesses the computational reproducibility of studies published in the journal.

If you are willing to participate as a reviewer, we kindly ask you to complete this short survey.

In case you have any questions about the project, please do not hesitate contact the project team at <u>ManSciReP@informs.org</u>.

Next

Your full name:

Your email address:

Your affiliation:

Please do not use abbreviations. For multiple affiliations uses a semi-colon (;) to separate the affiliations.

Your current position:

	Ductore
U	Protessor

Associate Professor

Assistant Professor

O PostDoc

Other academic with PhD (e.g., lecturer)

O Ph.D. Candidate

O Professional with Ph.D.

Other:

In what year did you receive your Ph.D.?

Back		Next

At which departments of Management Science would you typically submit your research paper?

Please drag&drop the respective departments to the box on the right, and rank them.

D		A		÷
De	oar	τm	en	IS

Accounting

Beh. Eco. & Decision Analysis

Business Strategy

Data Science

Entrepr. and Innovation

Finance

Healthcare Mgmt.

Information Systems

Marketing

Operations Management

Optimization

Organizations

Revenue Mgmt. and Market Analytics

Stochastic Models and Simulation

	My o	depart	ments	

Which programming language/analysis software/framework do you have access to and are comfortable with?

C/C++	Jupyter		R
Fortran	Lingo		SAS
Gams	Mathematic	a	SPSS
Gauss	Matlab		SQL
🗌 Gurobi	MS Office		Stan
🗌 Java	Python		Stata
🗌 Julia			
Which subscription databases	do you have ac	ccess to?	
Compustat		U.S. Census	s Bureau
CRSP		WRDS	
E Factset			

Back

Next

Your expectations:

In your estimation, what proportion of Management Science papers **under the current Data & Code disclosure policy** (replication packages required and reviewed for completeness by Code and Data editor) can be **fully reproduced** with the available replication materials?

0	10	20	30	40	50	60	70	80	90	100
In y	our estima	tion, wha	t proporti	on of Ma	nagemen	t Science	papers u	inder the	previou	S
pol	cy (replica	ation pack	cages exp	bected bu	it not veri	ied or rev	/iewed) c	an be full	У	
rep	roduced v	vith the a	vallable r	eplication	materials	37				
0	10	20	30	40	% 50	60	70	80	90	100
		20	55	-10						100
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В	ack .									BXL
Mar	accement S	cience R	enroducib	ility Proje	ct					
IVICLI	agomonico		oproducio	inty i rojo	ol .					
	We thank	vou for rea	istering as	a reviewer	for the Ma	nagement	Science Re	producibilit	v project.	
		Your reg	istration ha	s been rec	orded. We	will be in to	ouch in due	course.	,, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	
	In cas	se of any q	uestions, p	lease conta	act the proj	ect team at	ManSciRe	P@informs	.org.	

E.3 Reproducibility report survey

Management Science Reproducibility Project

Welcome to the report survey for the Management Science Reproducibility Project.

Here we ask you about your attempt to reproduce the results of your assigned Management Science article.

Before you start completing this report survey, **please familiarize yourself with our** guidelines for reviewers.

Please enter your email address:

Please enter the DOI of the article (10.1287/mnsc.XXXX.XXXX) that you reviewed:

Please enter the title of the article:

If there was a second person that significantly contributed to this review and should be given credit, please list the name, email address, and affiliation.

What is your overall assessment of the reproducibility of this article's main results (tables, figures, other results in the main manuscript)?

O Fully reproduced.	
O Largely reproduced, with minor issues.	
 Largely not reproduced, with major issues. 	
O Not reproduced.	
O Not reproduced but consistent with log files.	
O Not based on any data analysis, simulation, or code.	
	Next
Management Science Reproducibility Project	
The package includes a README file:	
Yes	
⊖ No	
Was the README file sufficiently helpful to facilitate the reproduction?	
⊖ Yes	
⊖ No	
Any comment on the README file?	
Back	Next

Does the replication package already include all the necessary DATA to reproduce the results reported in the main manuscript?

⊖ Yes
No, the analysis does not need data.
No, the package includes only partial data.
No, the package includes only sample or synthetic data.
No, the package includes no data at all.
The missing data
Can be obtained for free from publicly available sources.
Can be obtained from a commercial provider against a one-time fee or for a subscription fee.

Can be obtained in a different way (e.g., upon request to the data owner (not authors!), etc.).

Cannot be obtained.

Please list the data sources used in the study. (E.g., "lab experiment", "own survey with representative panel", "Comstat, CRSP", ...)

Any other comments on data availability?

Were you able to obtain all data needed to attempt a reproduction of all results?

⊖ Yes

No

If applicable, can you please explain any obstacles you had to overcome, or obstacles you could not overcome, in obtaining a complete dataset for review?



Are log files provided from the authors' own running of the code on the original data, such that one can still compare results reported in the paper with the log file in case data cannot be obtained and/or the result cannot be reproduced?

Yes, log files are provided for all results.

C Log files are provided for some results, but not for others.

O No, log files are not provided within the replication package.

Back

Next

Does the replication package include necessary CODE to reproduce the results reported in the main manuscript?

Yes.		
O No, code is not needed to repr	oduce results.	
O No, code is only partially provid	led.	
O No, code is not provided.		
Which type of code is provided	?	
C/C++	Lingo	R
Fortran	Maple	SAS
Gams	Mathematica	SPSS
Gauss	Matlab	SQL
Gurobi	MS Office	Stan
🗌 Java	Peri	Stata
🗌 Julia	Python	Other
Jupyter		
Back		Next

How many tables does the main manuscript contain overall?



How many figures does the main manuscript contain overall?



Back

Back

Next

Management Science Reproducibility Project

For each TABLE in the paper, please indicate whether it is a results table (that should be reproducible), whether you were able to reproduce it, and provide any details/comments on obstacles/issues.



Any further comments on the reproduction of tables?



Next

For each FIGURE in the paper, please indicate whether it is a results table (that should be reproducible), whether you were able to reproduce it, and provide any details/comments on obstacles/issues.

	Reproducible?	Can you provide
		any comments/details?
Figure 1	~ ~	
Figure 2	~	
Figure 3	v	
		any comments/details?
Any further com	ments on the reproduction of figures?	
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	Management Science F	Reproducibility Project
How ma from sta reprodu	any OTHER RESULTS reported in the tatistical tests not yet reported in the tab ace?	text of the main manuscript (e.g., p-values les / figures) did you identify and attempt to
How ma	any of these results were you able to fu	lly reproduce?
0		
Any cor	nments / details on the reproduction of	other results reported only in the text?
		11.
Back		Next

Please upload **one single file** (pdf, zip, etc.) that contains the log files / screenshots / outputs from your analysis that you used to check the tables and figures of the manuscript.

Drop files or click here to upload
Back Next Management Science Reproducibility Project
When attempting reproduction of this paper's results, did you have to change/fix any CODE (other than changing the working directory, etc.)?
Yes
⊖ No
Any comments / details on type and extent of code changes?
When attempting reproduction of this paper's results, did you have to change / fix / transform any DATASETS?
Yes
⊖ No
Any comments / details on type and extent of dataset changes?
Approximately, how much time (in hours) did you devote to the reproduction of this paper?
0

= not straightforward/very o 10	20	30	40	50	60	100 = ver 70	y straightforwa 80	ard/not at all complicated 90 100
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This concludes the report survey. Thank you so much for your efforts.

When you click the "submit" button below, the report will be submitted and you will not be able to go back and make any changes.

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E.4 Reviewer guidelines

Management Science Reproducibility Project Reviewer Guidelines

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We ask you to attempt to reproduce the results in the main manuscript of the paper. Results include tables and figures that are based on data or code, as well as results only reported verbally in the text (e.g., statistical test results not reported in tables and figures). You can ignore results reported in the appendix or in footnotes. Note that this assessment is purely about reproducibility, not about the appropriateness, soundness, or robustness of applied methods.

Some packages, in particular older ones submitted before the new code and data disclosure policy took effect, may not include data or code, or provide only limited documentation. In any case, please make an honest attempt to reproduce the results based on the information provided in the paper, appendix, and replication package. Report any barriers to reproduce the results in the final report survey.

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Please do not communicate with authors directly. We want to keep strict reviewer anonymity. The goal of this reproducibility project is to establish how many articles can be reproduced based *only* on the information provided in the paper, the appendix, and the replication package, i.e., *without* having to contact the authors in the process.

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Please apply the same ethical standards to this review as you would to a regular manuscript review at Management Science. In particular, there is a conflict of interest if one of the authors is/was your advisor or student, works at the same institution as you, is/was a co-author during the last 5 years, or if you have otherwise an interest in the outcome of the reproduction attempt. Please report any conflict of interest to us, and we will assign you to a different article/replication package.

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Paper/reviewer details: The first part of the survey just asks to identify yourself and the article/replication package you reviewed.

Overall assessment: We then ask for your overall assessment of the reproducibility of the whole article. Similar to the table-by-table, figure-by-figure results below, we ask you to select one of six possible assessment outcomes.

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Package documentation: The next part asks about the quality of documentation in the replication package, i.e., whether a README file is provided and whether it was sufficiently helpful in your reproduction attempt.

Data: The next part asks about the amount and quality of data included in the replication package, i.e., whether data, partial data, synthetic data or sample data is included or not, whether you could obtain non-included data from publicly available, private, or subscription sources, which data sources the study is based on, and whether in the end you had sufficient data to continue with the reproduction. It also asks whether log files are provided in the replication package.

Code: The next part asks whether code was included in the replication package and which type of code.

Tables/Figures: We then turn to the individual tables and figures in the main manuscript. First, we ask how many tables and figures there are overall in the manuscript, such that subsequently we can ask you for each single one of them, first for all tables, then for all figures. Please ignore tables and figures in the appendix.

You will see a table with one row per table in the manuscript. For each manuscript table, we ask via a dropdown field whether the manuscript table could be reproduced (fully, largely, largely not, not), whether there are log files consistent with the table, or whether the manuscript table was not based on data/analysis (e.g., a list of conditions, experimental design), and for details or comments.

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- "Largely not reproducible, with major issues" means that there are significant quantitative differences in reported numbers / output such that different qualitative conclusions and learnings would be drawn, or that important parts of the table/figure cannot be produced at all.
 For example, while some models in a regression table can be reproduced, others yield completely different numbers.
- "Not reproducible" means that the results from the reproduction cannot support the conclusions drawn in the paper from the table/figure, either because the output is different, or because the table/figure/result cannot be produced at all because of missing data or non-recoverable code.
- "Not reproducible but consistent with provided log file" means that you cannot reproduce the results based on running code on data, but that log files are included in the replication package, and the log files are fully consistent with the results reported in the paper.
- "Table/Figure not based on data/analysis" means that this table or figure is not based on results from analyzing data or otherwise running code, such that they do not need to be documented. Examples include tables outlining experimental designs, showing a timeline of events, or listing variables, or figures providing screenshots or illustrations, or visualizing a conceptual model.

In the comments, please provide a short description of details in case you were not able to fully reproduce some results, e.g., denoting the column or cells where differences appear, or commenting which errors in the code prevent you from running a model, etc.

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Other results: Next we ask about other results reported in the text of the main manuscript, e.g., p-values from statistical tests not yet reported in the tables/figures. For these results, we only ask for a summary report: how many results you identified, and how many you could reproduce. You can ignore results reported in the appendix or in footnotes.

Review documentation: After having reported your reproduction results, we ask you to upload log files, screenshots, or output files that you compared to the results reported in the paper. Please include all logs/screenshots in one single file (pdf, zip, etc.).

Review experience: The last part of the survey asks about your experience when reviewing the replication package. Namely, we would like to know if you needed to fix/change any code or datasets in order to be able to run the reproduction, how much time you invested, how complicated/straightforward the reproduction was, and how you assess your own expertise in terms of the article's topic and the applied methods/software. We also ask for your view on the replicability (as opposed to reproducibility) of the article.

Review availability: The final question asks whether you would be available to do another reproducibility review of a different article/replication package.