BUKTI KORESPONDENSI ANTARA TIM PENULIS DENGAN EDITOR

Subjek: Re: MA6929: Notification on Submission

wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id> **Sel, 1 Nov 2022, 12.44**

kepada v.matiukhina

Dear Managing Editor of Journal of Environmental Economics
I am trying to fixed the paper and try to fix it as soon as possible

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Fri, Oct 28, 2022 at 1:48 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Dear Supriyanto Supriyanto,

the manuscript Economic Growth and Environmental Degradation Paradox in ASEAN: A Simultaneous Equation Model with Dynamic Panel Data Approach, submitted to Environmental Economics Journal, needs to be revised.

Comments:

The maximum number of authors in a cover is 5. Choose five authors, fill in the cover correctly, and upload it to the system.

Please log in to your article submission (MA6929) and download the cover letter (in the right column) to your computer and fill it in.

Please upload the filled Cover letter form, that is - scanned version with your signatures, signed by hand (please fill in the form, print it, sign, scan and send us back (VIA UPLOAD NEW FILE).

1author=1signature.

The contribution of each author must be at least 4 checkmarks. Contributors who meet fewer than all 4 of the above criteria for authorship should not be listed as authors, but they should be acknowledged. The co-author must have an idea of all

the work content, and not be responsible only for the part that he performed directly. Individuals who have not contributed significantly to the scientific results and the article preparation may be mentioned at the end of the article; the authors may express their gratitude with reference to how these persons contributed to this scientific work.

https://businessperspectives.org/publishing-policies2/authorship-and-contributorship

All lines in the cover must be completed. Including university, university website, Orcid/ ResearcherID, etc.

Without a properly filled cover letter form, we cannot consider your articleadline}}

To revise a manuscript please don’t forget to log in to the system and to upload a revised manuscript!

Kind regards,

Valeria Matiukhina
Managing Editor
Journal Environmental Economics

Subjek: MA6929: Notification on Submission

v.matiukhina@manuscript-adminsystem.com **Kam, 3 Nov 2022, 15.59**

kepada wiwiek.adawiyah

Dear Supriyanto Supriyanto,

the manuscript Economic Growth and Environmental Degradation Paradox in ASEAN: A Simultaneous Equation Model with Dynamic Panel Data Approach, submitted to Environmental Economics Journal, needs to be revised.

Comments: The author must take a close look at the manuscript requirements. They are not too rigid, but we recommend to meet them. Therefore, we ask the authors to make every effort to meet the requirements, as it will provide the quality of their materials and will make it easier for the editorial staff to set the manuscript for publication.

Business Perspectives - Environmental Economics

Please, keep in mind that research paper, which is a final report on the finished original experimental study (the structure is Abstract, Introduction, Literature review, Method, Results, Discussion, Conclusion)

Check out what should be in this or that section and correctly distribute the material into sections. Do not introduce new sections. Do not divide sections into small subdivisions, including by introducing subheadings.

State the purpose of the study clearly and specifically.

The number of words in the paper may vary from 4000 to 6000. Considering the issue concerning the calculation of the number of words in the paper, the information about the authors, title, abstract and keywords, list of references and appendices should not be included. The number of sources, in the list of references, should be determined by an author directly but be on average within 30-50. In the review articles, this number can be significantly higher. Supplementary materials should not exceed 5 pages.

The Abstract (its volume is 150-250 words) should contain the following sequence of presentation of the material - relevance, purpose, result, conclusion. The result should be devoted to most of the Abstract volume. You should provide quantitative indicators of the demonstration of the research result.

The purpose of keywords is to provide the insight to the reader into the contents of the paper. They should reflect the area of the research. The number of keywords should be 5-10 in average. There should not be the sentences, but the words or word groups. If the object of the study is not mentioned in the title of the paper (including the country, the region), it should be added to the list of keywords. There is no need to replicate words from the title of the manuscript.

You need to clarify JEL codes. (double-digit) If earlier the author was not aware of this classification system, he/she should attentively look through it in order to have a common understanding of all the areas defined in it http://www.aeaweb.org/jel/jel_class_system.php. The codes, indicated by the author should clearly reflect the research area. The author is welcome to use the codes from two or three areas, if they are covered in the research.

The Introduction (this is half a page-page of text) should be devoted to the relevance of the research topic and the formulation of the problem in general.

The Literature review also requires revision and consistency of the presentation of the material. While its very poor. It should start with a few introductory sentences and also be completed with 2-3 generalizing sentences. Then you should formulate the purpose of the study. The Literature review of the analyzed sources should be 40-50.

Then the Methods should be presented.

The Result section is the main section of the article.

Then there should be a Discussion section. There should be a discussion of the study results, comparison with previous ones, a discussion of why the authors have exactly such results, determination of further prospects.

The Conclusion section is built incorrectly. There should be such logic - point out the purpose of the study, briefly demonstrate the result obtained, point out what conclusions should be drawn from it.

The deadline for revisions is 2022-11-08

To revise a manuscript please don’t forget to log in to the system and to upload a revised manuscript!

Kind regards,

Valeria Matiukhina
Managing Editor
Journal Environmental Economics

Subjek: У відповідь: MA6929: Notification on Submission

v.matiukhina@manuscript-adminsystem.com **Kam, 3 Nov 2022, 16.06**

kepada wiwiek.adawiyah 1

Dear authors,

Also, the plagiarism report attached.
Please remove plagiarism and ABC.

Our journal strictly observes the principles of publication ethics, including when talking about citing the works of other scientists and the works they published earlier. Any loanwords, including text loans (even insignificant), are unacceptable without mentioning their author.
We kindly ask you to pay attention to the widespread problem of wrong citation when Author A somehow gives (mentions, retells) the text fragment from the work (published by Author B), which contains the reference to other work (published by Author C).
In this case there are two options of correct citation:
1 – cite the work of Author B and note that he/she, in turn, cited the work of Author C;
2 – directly mention the work of Author C as well and cite it.
Do not forget that you can also use direct citations, that is why please use the quotation marks and when citing the source please note the page from which this quotation was taken.
You should be absolutely sure that you did not violate the principles of publication ethics. If there are at least small doubts that there can be loanwords in your text, we kindly ask you to check the manuscript for plagiarism by yourself using the special instruments (plagiarism detection software).

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 1 листопада 2022 р. 6:44
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: MA6929: Notification on Submission

Dear Managing Editor of Journal of Environmental Economics

I am trying to fixed the paper and try to fix it as soon as possible

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Fri, Oct 28, 2022 at 1:48 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Dear Supriyanto Supriyanto,

the manuscript Economic Growth and Environmental Degradation Paradox in ASEAN: A Simultaneous Equation Model with Dynamic Panel Data Approach, submitted to Environmental Economics Journal, needs to be revised.

Comments:

The maximum number of authors in a cover is 5. Choose five authors, fill in the cover correctly, and upload it to the system.

Please log in to your article submission (MA6929) and download the cover letter (in the right column) to your computer and fill it in.

Please upload the filled Cover letter form, that is - scanned version with your signatures, signed by hand (please fill in the form, print it, sign, scan and send us back (VIA UPLOAD NEW FILE).

1author=1signature.

The contribution of each author must be at least 4 checkmarks. Contributors who meet fewer than all 4 of the above criteria for authorship should not be listed as authors, but they should be acknowledged. The co-author must have an idea of all the work content, and not be responsible only for the part that he performed directly.

Individuals who have not contributed significantly to the scientific results and the article preparation may be mentioned at the end of the article; the authors may express their gratitude with reference to how these persons contributed to this scientific work.

https://businessperspectives.org/publishing-policies2/authorship-and-contributorship

All lines in the cover must be completed. Including university, university website, Orcid/ ResearcherID, etc.

Without a properly filled cover letter form, we cannot consider your articleadline}}

To revise a manuscript please don't forget to log in to the system and to upload a revised manuscript!

Kind regards,

Valeria Matiukhina
Managing Editor
Journal Environmental Economics

Satu lampiran • Dipindai dengan Gmail

Subjek: MA6929: Notification on Submission

v.matiukhina@manuscript-adminsystem.com **Jum, 11 Nov 2022, 18.09**

kepada wiwiek.adawiyah

Dear Supriyanto Supriyanto,

the manuscript Economic Growth and Environmental Degradation Paradox in ASEAN: A Simultaneous Equation Model with Dynamic Panel Data Approach, submitted to Environmental Economics Journal, needs to be revised.

Comments: The authors must once again carefully study the previous recommendations and editorial requirements for the design and semantic content of the article. Every requirement must be met.

Business Perspectives - Environmental Economics

The deadline for revisions is 2022-11-17

To revise a manuscript please don’t forget to log in to the system and to upload a revised manuscript!

Kind regards,

Valeria Matiukhina
Managing Editor
Journal Environmental Economics

Subjek: MA6929: Notification on Submission

v.matiukhina@manuscript-adminsystem.com **Sel, 22 Nov 2022, 13.25**

kepada wiwiek.adawiyah

Anda sedang melihat pesan terlampir.

Email Universitas Jenderal Soedirman tidak dapat memverifikasikan keautentikan pesan terlampir.

Dear Supriyanto Supriyanto,

The submitted manuscript Economic Growth and Environmental Degradation Paradox in ASEAN: A Simultaneous Equation Model with Dynamic Panel Data Approach to Environmental Economics Journal has passed the review process and is waiting for your decision regarding the publishing.

Please log in to the system to start or decline the publishing process.

Thanks.

Kind regards,

Valeria Matiukhina
Managing Editor
Journal Environmental Economics

Subjek: Re: У відповідь: MA6929: Author's response to final decision

wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id> **Rab, 23 Nov 2022, 20.04**

kepada v.matiukhina

Anda sedang melihat pesan terlampir.

Email Universitas Jenderal Soedirman tidak dapat memverifikasikan keautentikan pesan terlampir.

Ok noted, in that case we will choose only five authors and send back to you the revised manuscript

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 5:11 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear wiwiek.adawiyah,

NO. This number of authors is unacceptable.
Maximum -5.
Or you change the quantity to 5 and resign cover letter form. Or the article was rejected and the author is blacklisted.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 10:46
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for accepting our manuscript to be published in issue 2022 of the journal "Environmental Economics", we will pay the APC, using credit card and let you know once it is done. I herewith enclosed the latest version of our article as we cannot

upload it in the manuscript administration system. This new manuscript have included all eleven authors based on the names uploaded in the manuscript systems. Please let us know if you agree with this new manuscript with all eleven authors as uploaded in the system.

Regards,

Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

Subjek: MA6929: Author's response to final decision

wiwiek.adawiyah 1 **<wiwiek.adawiyah@unsoed.ac.id>** **Rab, 23 Nov 2022, 16.46**

kepada v.matiukhina

Dear Chief Editor

Thank you for accepting our manuscript to be published in issue 2022 of the journal "Environmental Economics", we will pay the APC, using credit card and let you know once it is done. I herewith enclosed the latest version of our article as we cannot upload it in the manuscript administration system. This new manuscript have included all eleven authors based on the names uploaded in the manuscript systems. Please let us know if you agree with this new manuscript with all eleven authors as uploaded in the system.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

Subjek: У відповідь: У відповідь: MA6929: Author's response to final decision

v.matiukhina@manuscript-adminsystem.com **Rab, 23 Nov 2022, 17.00**

kepada wiwiek.adawiyah 1

Anda sedang melihat pesan terlampir.

Email Universitas Jenderal Soedirman tidak dapat memverifikasikan keautentikan pesan terlampir.

Dear author,

To pay online on our web-site via a credit card.
https://www.businessperspectives.org/index.php/journals/environmental-economics#options

Please note that you must first register on the site. https://businessperspectives.org/login?view=registration (in case you are not registered yet).

After payment, please provide the order number. (instruction is attached-following the example of another journal, however, the principle of payment is the same)).

Kind regards,
Valeria

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 10:36
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: MA6929: Author's response to final decision

Dear Chief Editor
Thank you for accepting our manuscript to be published in issue 2022 of the journal " Environmental Economics", we will pay the APC, using credit card and let you know once it is done. I herewith enclosed the latest version of our article as we cannot upload it in the manuscript administration system. This new manuscript have included all eleven authors based on the names uploaded in the manuscript systems. Please let us know if you agree with this new manuscript with all eleven authors as uploaded in the system.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business

Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 2:10 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Dear authors,

You have consented to the publication.
Therefore, I would like to inform you that your manuscript titled “Economic Growth and Environmental Degradation Paradox in ASEAN: A Simultaneous Equation Model with Dynamic Panel Data Approach» has been accepted for publication, and will be published in issue 2022 of the journal “Environmental Economics”.

Article processing charge (APC) for “Environmental Economics” the authors with affiliation in high-income countries or upper middle-income countries is 595 €,
https://data.worldbank.org/country
https://businessperspectives.org/journals/environmental-economics#article-processing-charge

The article processing charge (APC) ensures the full immediate access to the article on the publisher’s website (without registration on the site and embargo period). The APC covers the costs of publication process (copy editing, formatting the text, to compose the figures and tables, etc.) including the administrating of peer-review process, the permanent archiving of the articles, site administrating (hosting the files of the articles, maintenance and support of the site), the promotion of the journal and articles (to share the journal's content all over the world, serve the indexing services, etc.) and customers support.

We offer 2 methods of payment: 1) to pay online on our web-site via a credit card. 2) by bank transfer ; Please, let me know, which one is convenient for you?

As soon as the payment will be done, I’ll provide you with APC confirmation letter to let you have the reimbursement from your institution (if you need).

The manuscript will be open access, in compliance with LLC “CPC “Business Perspectives” copyright policy, you will retain all rights to the contents of the published article under the Creative Commons license: CC BY 4.0..
Detailed information at Creative Commons
site: https://creativecommons.org/licenses/by/4.0/

I will send you a publication agreement and acceptance letter after you choosing payment method.
I look forward to hearing from you soon.

Kind regards,

Valeria Matiukhina
Managing Editor | International Research Journals| LLC “CPC “Business Perspectives”
v.matiukhina@businessperspectives.org | https://businessperspectives.org/journals| http://www.businessperspectives.org
Follow us on LinkedIn: https://www.linkedin.com/company/business-perspectives/
Follow us on Twitter: https://twitter.com/LLC_BP

Від: noreply=manuscript-adminsystem.com@mg.manuscript-adminsystem.com <noreply=manuscript-adminsystem.com@mg.manuscript-adminsystem.com> **Від імені** Manuscript Administration System
Надіслано: 23 листопада 2022 р. 7:38
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: MA6929: Author's response to final decision

The author has Agreed to publish the manuscript Economic Growth and Environmental Degradation Paradox in ASEAN: A Simultaneous Equation Model with Dynamic Panel Data Approach in the Environmental Economics Journal

Satu lampiran • Dipindai dengan Gmail

Subjek: Re: У відповідь: MA6929: Author's response to final decision

wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id> **Rab, 23 Nov 2022, 16.35**

kepada v.matiukhina

Anda sedang melihat pesan terlampir.

Email Universitas Jenderal Soedirman tidak dapat memverifikasikan keautentikan pesan terlampir.

Dear Chief Editor
Thank you for accepting our manuscript to be published in issue 2022 of the journal " Environmental Economics", we will pay the APC, using credit card and let you know once it is done. I herewith enclosed the latest version of our article as we cannot upload it in the manuscript administration system. This new manuscript have included all eleven authors based on the names uploaded in the manuscript systems. Please let us know if you agree with this new manuscript with all eleven authors as uploaded in the system.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 2:10 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Dear authors,

You have consented to the publication.
Therefore, I would like to inform you that your manuscript titled “Economic Growth and Environmental Degradation Paradox in ASEAN: A Simultaneous Equation Model with Dynamic Panel Data Approach» has been accepted for publication, and will be published in issue 2022 of the journal “Environmental Economics”.

Article processing charge (APC) for “Environmental Economics” the authors with affiliation in high-income countries or upper middle-income countries is 595 €,
https://data.worldbank.org/country
https://businessperspectives.org/journals/environmental-economics#article-processing-charge

The article processing charge (APC) ensures the full immediate access to the article on the publisher's website (without registration on the site and embargo period). The APC covers the costs of publication process (copy editing, formatting the text, to compose the figures and tables, etc.) including the administrating of peer-review process, the permanent archiving of the articles, site administrating (hosting the files of the articles, maintenance and support of the site), the promotion of the journal and articles (to share the journal's content all over the world, serve the indexing services, etc.) and customers support.

We offer 2 methods of payment: 1) to pay online on our web-site via a credit card. 2) by bank transfer ; Please, let me know, which one is convenient for you?

As soon as the payment will be done, I'll provide you with APC confirmation letter to let you have the reimbursement from your institution (if you need).

The manuscript will be open access, in compliance with LLC "CPC "Business Perspectives" copyright policy, you will retain all rights to the contents of the published article under the Creative Commons license: CC BY 4.0..
Detailed information at Creative Commons
site: https://creativecommons.org/licenses/by/4.0/

I will send you a publication agreement and acceptance letter after you choosing payment method.
I look forward to hearing from you soon.

Kind regards,
Valeria Matiukhina
Managing Editor | International Research Journals| LLC "CPC "Business Perspectives"
v.matiukhina@businessperspectives.org | https://businessperspectives.org/journals| http://www.businessperspectives.org
Follow us on LinkedIn: https://www.linkedin.com/company/business-perspectives/
Follow us on Twitter: https://twitter.com/LLC_BP

Від: noreply=manuscript-adminsystem.com@mg.manuscript-adminsystem.com <noreply=manuscript-adminsystem.com@mg.manuscript-adminsystem.com> **Від імені** Manuscript Administration System
Надіслано: 23 листопада 2022 р. 7:38
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: MA6929: Author's response to final decision

The author has Agreed to publish the manuscript Economic Growth and Environmental Degradation Paradox in ASEAN: A Simultaneous Equation Model with Dynamic Panel Data Approach in the Environmental Economics Journal

Satu lampiran • Dipindai dengan Gmail

Subjek: Re: У відповідь: У відповідь: MA6929: Author's response to final decision

wiwiek.adawiyah 1 **<wiwiek.adawiyah@unsoed.ac.id>** **Kam, 24 Nov 2022, 16.08**

kepada v.matiukhina

Anda sedang melihat pesan terlampir.

Email Universitas Jenderal Soedirman tidak dapat memverifikasikan keautentikan pesan terlampir.

Dear Chief Editor

Thank you for your reply. Below is the informations about author contributions:

Author Contributions
Conceptualization: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko
Data curation: Supriyanto
Formal analysis: Supriyanto
Investigation: Arintoko, Nunik Kadarwati.
Methodology: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko.
Project administration: Wiwiek Rabiatul Adawiyah, Dijan Rahajuni
Supervision: Dijan Rahajuni, Nunik Kadarwati
Validation: Dijan Rahajuni, Nunik Kadarwati
Visualization: Dijan Rahajuni.
Writing – original draft: Supriyanto
Writing – review & editing: Wiwiek Rabiatul Adawiyah, Arintoko

and information about the authors:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.
Wiwiek Rabiatul Adawiyah, Professor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.,
Arintoko, Doctor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

Regards,

Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122

Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 8:10 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear Prof. Wiwiek Rabiatul Adawiyah,

The article does not need to be redone. Need to rewrite and re-sign the cover. And dublicate me a contribution -*Example*-
Author Contributions
Conceptualization: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Data curation: Alla Shevchenko.
Formal analysis: Ruslana Zadorozhna.
Investigation: Ruslana Zadorozhna, Leonid Stadnik, Alla Shevchenko.
Methodology: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Project administration: Igor Paska, Larysa Satyr.
Supervision: Igor Paska, Larysa Satyr.
Validation: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Visualization: Ruslana Zadorozhna, Leonid Stadnik.
Writing – original draft: Ruslana Zadorozhna.
Writing – review & editing: Ruslana Zadorozhna.

and information about the authors by example:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 14:05
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: MA6929: Author's response to final decision

Ok noted, in that case we will choose only five authors and send back to you the revised manuscript

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 5:11 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear wiwiek.adawiyah,

NO. This number of authors is unacceptable.
Maximum -5.
Or you change the quantity to 5 and resign cover letter form. Or the article was rejected and the author is blacklisted.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 10:46
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for accepting our manuscript to be published in issue 2022 of the journal "Environmental Economics", we will pay the APC, using credit card and let you know once it is done. I herewith enclosed the latest version of our article as we cannot upload it in the manuscript administration system. This new manuscript have included all eleven authors based on the names uploaded in the manuscript systems. Please let us know if you agree with this new manuscript with all eleven authors as uploaded in the system.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

Satu lampiran • Dipindai dengan Gmail

Subjek: Re: У відповідь: У відповідь: У відповідь: MA6929

wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id> Rab, 30 Nov 2022, 21.57

kepada v.matiukhina

Thank you for your information.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 30, 2022 at 5:12 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Dear Prof. Wiwiek Rabiatul Adawiyah,
Attached you'll find a paper for last proofreading before publication. **With the authors you have approved and on which the cover is signed.**
Please check the text of your article and correct mistakes (if any). Inform me if there are any corrections indicating page/line/column.
Pay attention, only changes to the title of the paper, list of authors or scientific errors will be considered and further approved by the publishing team. We reserve the right to make the final decision regarding style and the size of figures/tables/references.

Kind regards,
Valeria

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 30 листопада 2022 р. 3:13
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: У відповідь: MA6929

Dear Chief Editor of Environmental Economics

I would like to send the latest manuscript. We have improved the article based on your previous suggestions. Please ignore the previous mail as this is the latest version. We also restructured the authors' positions based on their contributions, and replace one author (Arintoko) with Nurul Anwar. Should you have further questions please do not hesitate to contact us

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Mon, Nov 28, 2022 at 2:29 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 28 листопада 2022 р. 8:17
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: MA6929

Thank you for your email, Please change the fourth (4) and the fifth (5) authors as follows:

4. *Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.*
5. Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

so the full compositions of five authors should be as follows (based on our latest email)

1. Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.
2. Wiwiek Rabiatul Adawiyah, Professor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.,
3. Arintoko, Doctor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
4. Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
5. Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

In our previous email we have sent cover letter based on the updated composition of the authors as stated above, thank you very much

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University

Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Mon, Nov 28, 2022 at 1:55 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Dear Prof. Wiwiek Rabiatul Adawiyah,
Attached you'll find a paper for first proofreading before publication.
Please check the text of your article and correct mistakes (if any). Inform me if there are any corrections indicating page/line/column.
I draw your attention to the fact that suggestions and comments were made in the text of the article.(highlighted) . Please process them
Pay attention, only changes to the title of the paper, list of authors or scientific errors will be considered and further approved by the publishing team. We reserve the right to make the final decision regarding style and the size of figures/tables/references. Will be waiting for your reply.
Kind regards,
Valeria

Від: v.matiukhina@manuscript-adminsystem.com <v.matiukhina@manuscript-adminsystem.com>
Надіслано: 24 листопада 2022 р. 15:24
Кому: 'wiwiek.adawiyah 1' <wiwiek.adawiyah@unsoed.ac.id>
Тема: MA6929
Важливість: Високий

Dear Prof. Wiwiek Rabiatul Adawiyah,
I confirm the receipt of the APC payment.
I will send you first proofreading asap.

I send you a publication agreement and acceptance letter. Please tick the box in points 1-8 of the agreement (in which Authors confirm that there is no conflict of interest to be declared), sign it and send me back.

Kind regards,
Valeria Matiukhina

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 24 листопада 2022 р. 10:09
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: У відповідь: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for your reply. Below is the informations about author contributions:

Author Contributions
Conceptualization: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko
Data curation: Supriyanto
Formal analysis: Supriyanto
Investigation: Arintoko, Nunik Kadarwati.
Methodology: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko.
Project administration: Wiwiek Rabiatul Adawiyah, Dijan Rahajuni
Supervision: Dijan Rahajuni, Nunik Kadarwati
Validation: Dijan Rahajuni, Nunik Kadarwati
Visualization: Dijan Rahajuni.
Writing – original draft: Supriyanto
Writing – review & editing: Wiwiek Rabiatul Adawiyah, Arintoko

and information about the authors:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.
Wiwiek Rabiatul Adawiyah, Professor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.,
Arintoko, Doctor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 8:10 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear Prof. Wiwiek Rabiatul Adawiyah,

The article does not need to be redone. Need to rewrite and re-sign the cover. And dublicate me a contribution -*Example*-
Author Contributions
Conceptualization: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Data curation: Alla Shevchenko.
Formal analysis: Ruslana Zadorozhna.
Investigation: Ruslana Zadorozhna, Leonid Stadnik, Alla Shevchenko.
Methodology: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.

Project administration: Igor Paska, Larysa Satyr.
Supervision: Igor Paska, Larysa Satyr.
Validation: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Visualization: Ruslana Zadorozhna, Leonid Stadnik.
Writing – original draft: Ruslana Zadorozhna.
Writing – review & editing: Ruslana Zadorozhna.

and information about the authors by example:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 14:05
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: MA6929: Author's response to final decision

Ok noted, in that case we will choose only five authors and send back to you the revised manuscript

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 5:11 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear wiwiek.adawiyah,

NO. This number of authors is unacceptable.
Maximum -5.
Or you change the quantity to 5 and resign cover letter form. Or the article was rejected and the author is blacklisted.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 10:46
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for accepting our manuscript to be published in issue 2022 of the journal "Environmental Economics", we will pay the APC, using credit card and let you know once it is done. I herewith enclosed the latest version of our article as we cannot upload it in the manuscript administration system. This new manuscript have included all eleven authors based on the names uploaded in the manuscript systems. Please let us know if you agree with this new manuscript with all eleven authors as uploaded in the system.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

Subjek: >>: MA6929

v.matiukhina@manuscript-adminsystem.com **Rab, 30 Nov 2022, 13.52**

kepada wiwiek.adawiyah

Dear Prof. Wiwiek Rabiatul Adawiyah,
I send you a publication agreement and acceptance letter. Please tick the box in points 1-8 of the agreement (in which Authors confirm that there is no conflict of interest to be declared), sign it and send me back.

Kind regards,
Valeria Matiukhina

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 24 листопада 2022 р. 10:09
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: У відповідь: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for your reply. Below is the informations about author contributions:

Author Contributions
Conceptualization: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko
Data curation: Supriyanto
Formal analysis: Supriyanto
Investigation: Arintoko, Nunik Kadarwati.
Methodology: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko.
Project administration: Wiwiek Rabiatul Adawiyah, Dijan Rahajuni
Supervision: Dijan Rahajuni, Nunik Kadarwati
Validation: Dijan Rahajuni, Nunik Kadarwati
Visualization: Dijan Rahajuni.
Writing – original draft: Supriyanto
Writing – review & editing: Wiwiek Rabiatul Adawiyah, Arintoko

and information about the authors:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.
Wiwiek Rabiatul Adawiyah, Professor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.,
Arintoko, Doctor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 8:10 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear Prof. Wiwiek Rabiatul Adawiyah,

The article does not need to be redone. Need to rewrite and re-sign the cover. And dublicate me a contribution -*Example*-
Author Contributions
Conceptualization: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Data curation: Alla Shevchenko.
Formal analysis: Ruslana Zadorozhna.
Investigation: Ruslana Zadorozhna, Leonid Stadnik, Alla Shevchenko.
Methodology: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Project administration: Igor Paska, Larysa Satyr.
Supervision: Igor Paska, Larysa Satyr.
Validation: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Visualization: Ruslana Zadorozhna, Leonid Stadnik.
Writing – original draft: Ruslana Zadorozhna.
Writing – review & editing: Ruslana Zadorozhna.

and information about the authors by example:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 14:05
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: MA6929: Author's response to final decision

Ok noted, in that case we will choose only five authors and send back to you the revised manuscript

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 5:11 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear wiwiek.adawiyah,

NO. This number of authors is unacceptable.
Maximum -5.
Or you change the quantity to 5 and resign cover letter form. Or the article was rejected and the author is blacklisted.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 10:46
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for accepting our manuscript to be published in issue 2022 of the journal "Environmental Economics", we will pay the APC, using credit card and let you know once it is done. I herewith enclosed the latest version of our article as we cannot upload it in the manuscript administration system. This new manuscript have included all eleven authors based on the names uploaded in the manuscript systems. Please let us know if you agree with this new manuscript with all eleven authors as uploaded in the system.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

Satu Lampiran • Dipindai dengan Gmail

Lamp [5]

Subjek: У відповідь: У відповідь: У відповідь: У відповідь: MA6929

v.matiukhina@manuscript-adminsystem.com Kam, 1 Des 2022, 13.52

kepada wiwiek.adawiyah 1

Dear Prof. Wiwiek Rabiatul Adawiyah,

Please confirm that the proofreading is ok, and give the go-ahead for the article's publication. And I will post it today.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 30 листопада 2022 р. 15:57
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: У відповідь: У відповідь: MA6929

Thank you for your information.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 30, 2022 at 5:12 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Dear Prof. Wiwiek Rabiatul Adawiyah,
Attached you'll find a paper for last proofreading before publication. **With the authors you have approved and on which the cover is signed.**
Please check the text of your article and correct mistakes (if any). Inform me if there are any corrections indicating page/line/column.
Pay attention, only changes to the title of the paper, list of authors or scientific errors will be considered and further approved by the publishing team. We reserve the right to make the final decision regarding style and the size of figures/tables/references.

Kind regards,
Valeria

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 30 листопада 2022 р. 3:13
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: У відповідь: MA6929

Dear Chief Editor of Environmental Economics

I would like to send the latest manuscript. We have improved the article based on your previous suggestions. Please ignore the previous mail as this is the latest version. We also restructured the authors' positions based on their contributions, and replace one author (Arintoko) with Nurul Anwar. Should you have further questions please do not hesitate to contact us

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Mon, Nov 28, 2022 at 2:29 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 28 листопада 2022 р. 8:17
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: MA6929

Thank you for your email, Please change the fourth (4) and the fifth (5) authors as follows:

4. *Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.*
5. Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

so the full compositions of five authors should be as follows (based on our latest email)

1. Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.
2. Wiwiek Rabiatul Adawiyah, Professor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.,
3. Arintoko, Doctor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

4. Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
5. Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

In our previous email we have sent cover letter based on the updated composition of the authors as stated above, thank you very much

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Mon, Nov 28, 2022 at 1:55 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Dear Prof. Wiwiek Rabiatul Adawiyah,
Attached you'll find a paper for first proofreading before publication.
Please check the text of your article and correct mistakes (if any). Inform me if there are any corrections indicating page/line/column.
I draw your attention to the fact that suggestions and comments were made in the text of the article.(highlighted) . Please process them
Pay attention, only changes to the title of the paper, list of authors or scientific errors will be considered and further approved by the publishing team. We reserve the right to make the final decision regarding style and the size of figures/tables/references. Will be waiting for your reply.
Kind regards,
Valeria

Від: v.matiukhina@manuscript-adminsystem.com <v.matiukhina@manuscript-adminsystem.com>
Надіслано: 24 листопада 2022 р. 15:24
Кому: 'wiwiek.adawiyah 1' <wiwiek.adawiyah@unsoed.ac.id>
Тема: MA6929
Важливість: Високий

Dear Prof. Wiwiek Rabiatul Adawiyah,
I confirm the receipt of the APC payment.
I will send you first proofreading asap.

I send you a publication agreement and acceptance letter. Please tick the box in points 1-8 of the agreement (in which Authors confirm that there is no conflict of interest to be declared), sign it and send me back.

Kind regards,
Valeria Matiukhina

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 24 листопада 2022 р. 10:09
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: У відповідь: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for your reply. Below is the informations about author contributions:

Author Contributions
Conceptualization: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko
Data curation: Supriyanto
Formal analysis: Supriyanto
Investigation: Arintoko, Nunik Kadarwati.
Methodology: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko.
Project administration: Wiwiek Rabiatul Adawiyah, Dijan Rahajuni
Supervision: Dijan Rahajuni, Nunik Kadarwati
Validation: Dijan Rahajuni, Nunik Kadarwati
Visualization: Dijan Rahajuni.
Writing – original draft: Supriyanto
Writing – review & editing: Wiwiek Rabiatul Adawiyah, Arintoko

and information about the authors:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.
Wiwiek Rabiatul Adawiyah, Professor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.,
Arintoko, Doctor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 8:10 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear Prof. Wiwiek Rabiatul Adawiyah,

The article does not need to be redone. Need to rewrite and re-sign the cover. And dublicate me a contribution -*Example*-
Author Contributions
Conceptualization: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Data curation: Alla Shevchenko.
Formal analysis: Ruslana Zadorozhna.
Investigation: Ruslana Zadorozhna, Leonid Stadnik, Alla Shevchenko.
Methodology: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Project administration: Igor Paska, Larysa Satyr.
Supervision: Igor Paska, Larysa Satyr.
Validation: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Visualization: Ruslana Zadorozhna, Leonid Stadnik.
Writing – original draft: Ruslana Zadorozhna.
Writing – review & editing: Ruslana Zadorozhna.

and information about the authors by example:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 14:05
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: MA6929: Author's response to final decision

Ok noted, in that case we will choose only five authors and send back to you the revised manuscript

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 5:11 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear wiwiek.adawiyah,

NO. This number of authors is unacceptable.
Maximum -5.
Or you change the quantity to 5 and resign cover letter form. Or the article was rejected and the author is blacklisted.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 10:46
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for accepting our manuscript to be published in issue 2022 of the journal "Environmental Economics", we will pay the APC, using credit card and let you know once it is done. I herewith enclosed the latest version of our article as we cannot upload it in the manuscript administration system. This new manuscript have included all eleven authors based on the names uploaded in the manuscript systems. Please let us know if you agree with this new manuscript with all eleven authors as uploaded in the system.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

Subjek: Re: MA6929

wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id> **Sen, 5 Des 2022, 15.19**

kepada v.matiukhina

Dear Chief Editor of Environmental Economics

I have filled in and signed the publication agreement, and send it back to you, I agreed with the article draft and no further correction, thank you so much

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Mon, Dec 5, 2022 at 2:53 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Dear Prof. Wiwiek Rabiatul Adawiyah,

Please confirm that the proofreading is ok, and give the go-ahead for the article's publication. And I will publish the article.

Also, please tick the box in points 1-8 of the agreement (in which Authors confirm that there is no conflict of interest to be declared), sign it and send me back.

Kind regards,

Від: v.matiukhina@manuscript-adminsystem.com <v.matiukhina@manuscript-adminsystem.com>
Надіслано: 1 грудня 2022 р. 7:53
Кому: 'wiwiek.adawiyah 1' <wiwiek.adawiyah@unsoed.ac.id>
Тема: У відповідь: У відповідь: У відповідь: У відповідь: MA6929
Важливість: Високий

Dear Prof. Wiwiek Rabiatul Adawiyah,

Please confirm that the proofreading is ok, and give the go-ahead for the article's publication. And I will post it today.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 30 листопада 2022 р. 15:57
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: У відповідь: У відповідь: MA6929

Thank you for your information.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 30, 2022 at 5:12 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Dear Prof. Wiwiek Rabiatul Adawiyah,
Attached you'll find a paper for last proofreading before publication. **With the authors you have approved and on which the cover is signed.**
Please check the text of your article and correct mistakes (if any). Inform me if there are any corrections indicating page/line/column.
Pay attention, only changes to the title of the paper, list of authors or scientific errors will be considered and further approved by the publishing team. We reserve the right to make the final decision regarding style and the size of figures/tables/references.

Kind regards,
Valeria

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 30 листопада 2022 р. 3:13
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: У відповідь: MA6929

Dear Chief Editor of Environmental Economics

I would like to send the latest manuscript. We have improved the article based on your previous suggestions. Please ignore the previous mail as this is the latest version. We also restructured the authors' positions based on their contributions, and replace one author (Arintoko) with Nurul Anwar. Should you have further questions please do not hesitate to contact us

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Mon, Nov 28, 2022 at 2:29 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 28 листопада 2022 р. 8:17
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: MA6929

Thank you for your email, Please change the fourth (4) and the fifth (5) authors as follows:

4. *Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.*
5. Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

so the full compositions of five authors should be as follows (based on our latest email)

1. Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.
2. Wiwiek Rabiatul Adawiyah, Professor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.,
3. Arintoko, Doctor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
4. Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
5. Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

In our previous email we have sent cover letter based on the updated composition of the authors as stated above, thank you very much

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University

Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Mon, Nov 28, 2022 at 1:55 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Dear Prof. Wiwiek Rabiatul Adawiyah,
Attached you'll find a paper for first proofreading before publication.
Please check the text of your article and correct mistakes (if any). Inform me if there are any corrections indicating page/line/column.
I draw your attention to the fact that suggestions and comments were made in the text of the article.(highlighted) . Please process them
Pay attention, only changes to the title of the paper, list of authors or scientific errors will be considered and further approved by the publishing team. We reserve the right to make the final decision regarding style and the size of figures/tables/references. Will be waiting for your reply.
Kind regards,
Valeria

Від: v.matiukhina@manuscript-adminsystem.com <v.matiukhina@manuscript-adminsystem.com>
Надіслано: 24 листопада 2022 р. 15:24
Кому: 'wiwiek.adawiyah 1' <wiwiek.adawiyah@unsoed.ac.id>
Тема: MA6929
Важливість: Високий

Dear Prof. Wiwiek Rabiatul Adawiyah,
I confirm the receipt of the APC payment.
I will send you first proofreading asap.

I send you a publication agreement and acceptance letter. Please tick the box in points 1-8 of the agreement (in which Authors confirm that there is no conflict of interest to be declared), sign it and send me back.

Kind regards,
Valeria Matiukhina

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 24 листопада 2022 р. 10:09
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: У відповідь: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for your reply. Below is the informations about author contributions:

Author Contributions
Conceptualization: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko
Data curation: Supriyanto
Formal analysis: Supriyanto
Investigation: Arintoko, Nunik Kadarwati.
Methodology: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko.
Project administration: Wiwiek Rabiatul Adawiyah, Dijan Rahajuni
Supervision: Dijan Rahajuni, Nunik Kadarwati
Validation: Dijan Rahajuni, Nunik Kadarwati
Visualization: Dijan Rahajuni.
Writing – original draft: Supriyanto
Writing – review & editing: Wiwiek Rabiatul Adawiyah, Arintoko

and information about the authors:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.
Wiwiek Rabiatul Adawiyah, Professor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.,
Arintoko, Doctor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 8:10 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear Prof. Wiwiek Rabiatul Adawiyah,

The article does not need to be redone. Need to rewrite and re-sign the cover. And dublicate me a contribution -*Example*-
Author Contributions
Conceptualization: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Data curation: Alla Shevchenko.
Formal analysis: Ruslana Zadorozhna.
Investigation: Ruslana Zadorozhna, Leonid Stadnik, Alla Shevchenko.
Methodology: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.

Project administration: Igor Paska, Larysa Satyr.
Supervision: Igor Paska, Larysa Satyr.
Validation: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Visualization: Ruslana Zadorozhna, Leonid Stadnik.
Writing – original draft: Ruslana Zadorozhna.
Writing – review & editing: Ruslana Zadorozhna.

and information about the authors by example:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 14:05
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: MA6929: Author's response to final decision

Ok noted, in that case we will choose only five authors and send back to you the revised manuscript

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 5:11 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear wiwiek.adawiyah,

NO. This number of authors is unacceptable.
Maximum -5.
Or you change the quantity to 5 and resign cover letter form. Or the article was rejected and the author is blacklisted.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 10:46
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for accepting our manuscript to be published in issue 2022 of the journal "Environmental Economics", we will pay the APC, using credit card and let you know once it is done. I herewith enclosed the latest version of our article as we cannot upload it in the manuscript administration system. This new manuscript have included all eleven authors based on the names uploaded in the manuscript systems. Please let us know if you agree with this new manuscript with all eleven authors as uploaded in the system.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

Satu lampiran • Dipindai dengan Gmail

Subjek: Re: У відповідь: MA6929

wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id> **Sen, 2 Jan, 15.29**

kepada v.matiukhina

Dear Chief Editor of Journal Environment Economics

I would like to know, how long does it take for the paper to be published on Scopus.com?, I am looking forward to seeing your response, Thank you very much

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Mon, Nov 28, 2022 at 1:55 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Dear Prof. Wiwiek Rabiatul Adawiyah,
Attached you'll find a paper for first proofreading before publication.
Please check the text of your article and correct mistakes (if any). Inform me if there are any corrections indicating page/line/column.
I draw your attention to the fact that suggestions and comments were made in the text of the article.(highlighted) . Please process them
Pay attention, only changes to the title of the paper, list of authors or scientific errors will be considered and further approved by the publishing team. We reserve the right to make the final decision regarding style and the size of figures/tables/references. Will be waiting for your reply.
Kind regards,
Valeria

Від: v.matiukhina@manuscript-adminsystem.com <v.matiukhina@manuscript-adminsystem.com>
Надіслано: 24 листопада 2022 р. 15:24
Кому: 'wiwiek.adawiyah 1' <wiwiek.adawiyah@unsoed.ac.id>
Тема: MA6929
Важливість: Високий

Dear Prof. Wiwiek Rabiatul Adawiyah,
I confirm the receipt of the APC payment.

I will send you first proofreading asap.

I send you a publication agreement and acceptance letter. Please tick the box in points 1-8 of the agreement (in which Authors confirm that there is no conflict of interest to be declared), sign it and send me back.

Kind regards,
Valeria Matiukhina

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 24 листопада 2022 р. 10:09
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: У відповідь: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for your reply. Below is the informations about author contributions:

Author Contributions
Conceptualization: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko
Data curation: Supriyanto
Formal analysis: Supriyanto
Investigation: Arintoko, Nunik Kadarwati.
Methodology: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko.
Project administration: Wiwiek Rabiatul Adawiyah, Dijan Rahajuni
Supervision: Dijan Rahajuni, Nunik Kadarwati
Validation: Dijan Rahajuni, Nunik Kadarwati
Visualization: Dijan Rahajuni.
Writing – original draft: Supriyanto
Writing – review & editing: Wiwiek Rabiatul Adawiyah, Arintoko

and information about the authors:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.
Wiwiek Rabiatul Adawiyah, Professor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.,
Arintoko, Doctor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business

Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 8:10 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear Prof. Wiwiek Rabiatul Adawiyah,

The article does not need to be redone. Need to rewrite and re-sign the cover. And dublicate me a contribution -*Example*-
Author Contributions
Conceptualization: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Data curation: Alla Shevchenko.
Formal analysis: Ruslana Zadorozhna.
Investigation: Ruslana Zadorozhna, Leonid Stadnik, Alla Shevchenko.
Methodology: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Project administration: Igor Paska, Larysa Satyr.
Supervision: Igor Paska, Larysa Satyr.
Validation: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Visualization: Ruslana Zadorozhna, Leonid Stadnik.
Writing – original draft: Ruslana Zadorozhna.
Writing – review & editing: Ruslana Zadorozhna.

and information about the authors by example:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 14:05
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: MA6929: Author's response to final decision

Ok noted, in that case we will choose only five authors and send back to you the revised manuscript

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 5:11 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear wiwiek.adawiyah,

NO. This number of authors is unacceptable.
Maximum -5.
Or you change the quantity to 5 and resign cover letter form. Or the article was rejected and the author is blacklisted.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 10:46
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for accepting our manuscript to be published in issue 2022 of the journal "Environmental Economics", we will pay the APC, using credit card and let you know once it is done. I herewith enclosed the latest version of our article as we cannot upload it in the manuscript administration system. This new manuscript have included all eleven authors based on the names uploaded in the manuscript systems. Please let us know if you agree with this new manuscript with all eleven authors as uploaded in the system.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

Subjek: Fwd: У відповідь: У відповідь: MA6929

wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id> Sen, 3 Apr, 08.39

kepada supriyanto2505

Anda sedang melihat pesan terlampir.

Email Universitas Jenderal Soedirman tidak dapat memverifikasikan keautentikan pesan terlampir.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

---------- Forwarded message ---------
From: <v.matiukhina@manuscript-adminsystem.com>
Date: Mon, Nov 28, 2022 at 2:29 PM
Subject: У відповідь: У відповідь: MA6929
To: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 28 листопада 2022 р. 8:17
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: MA6929

Thank you for your email, Please change the fourth (4) and the fifth (5) authors as follows:

4. *Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.*
5. Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

so the full compositions of five authors should be as follows (based on our latest email)

1. Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.
2. Wiwiek Rabiatul Adawiyah, Professor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.,
3. Arintoko, Doctor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
4. Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
5. Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

In our previous email we have sent cover letter based on the updated composition of the authors as stated above, thank you very much

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Mon, Nov 28, 2022 at 1:55 PM <v.matiukhina@manuscript-adminsystem.com> wrote:

Dear Prof. Wiwiek Rabiatul Adawiyah,
Attached you'll find a paper for first proofreading before publication.
Please check the text of your article and correct mistakes (if any). Inform me if there are any corrections indicating page/line/column.
I draw your attention to the fact that suggestions and comments were made in the text of the article.(highlighted) . Please process them
Pay attention, only changes to the title of the paper, list of authors or scientific errors will be considered and further approved by the publishing team. We reserve the right to make the final decision regarding style and the size of figures/tables/references. Will be waiting for your reply.
Kind regards,
Valeria

Від: v.matiukhina@manuscript-adminsystem.com <v.matiukhina@manuscript-adminsystem.com>
Надіслано: 24 листопада 2022 р. 15:24
Кому: 'wiwiek.adawiyah 1' <wiwiek.adawiyah@unsoed.ac.id>
Тема: MA6929
Важливість: Високий

Dear Prof. Wiwiek Rabiatul Adawiyah,
I confirm the receipt of the APC payment.
I will send you first proofreading asap.

I send you a publication agreement and acceptance letter. Please tick the box in points 1-8 of the agreement (in which Authors confirm that there is no conflict of interest to be declared), sign it and send me back.

Kind regards,
Valeria Matiukhina

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 24 листопада 2022 р. 10:09
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: У відповідь: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for your reply. Below is the informations about author contributions:

Author Contributions
Conceptualization: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko
Data curation: Supriyanto
Formal analysis: Supriyanto
Investigation: Arintoko, Nunik Kadarwati.
Methodology: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko.
Project administration: Wiwiek Rabiatul Adawiyah, Dijan Rahajuni
Supervision: Dijan Rahajuni, Nunik Kadarwati
Validation: Dijan Rahajuni, Nunik Kadarwati
Visualization: Dijan Rahajuni.
Writing – original draft: Supriyanto
Writing – review & editing: Wiwiek Rabiatul Adawiyah, Arintoko

and information about the authors:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.
Wiwiek Rabiatul Adawiyah, Professor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.,
Arintoko, Doctor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

Regards,

Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 8:10 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear Prof. Wiwiek Rabiatul Adawiyah,

The article does not need to be redone. Need to rewrite and re-sign the cover. And dublicate me a contribution -*Example*-
Author Contributions
Conceptualization: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Data curation: Alla Shevchenko.
Formal analysis: Ruslana Zadorozhna.
Investigation: Ruslana Zadorozhna, Leonid Stadnik, Alla Shevchenko.
Methodology: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Project administration: Igor Paska, Larysa Satyr.
Supervision: Igor Paska, Larysa Satyr.
Validation: Igor Paska, Larysa Satyr, Ruslana Zadorozhna.
Visualization: Ruslana Zadorozhna, Leonid Stadnik.
Writing – original draft: Ruslana Zadorozhna.
Writing – review & editing: Ruslana Zadorozhna.

and information about the authors by example:

Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 14:05
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: Re: У відповідь: MA6929: Author's response to final decision

Ok noted, in that case we will choose only five authors and send back to you the revised manuscript

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268

Web:fe.unsoed.ac.id

On Wed, Nov 23, 2022 at 5:11 PM <v.matiukhina@manuscript-adminsystem.com> wrote:
Dear wiwiek.adawiyah,

NO. This number of authors is unacceptable.
Maximum -5.
Or you change the quantity to 5 and resign cover letter form. Or the article was rejected and the author is blacklisted.

Kind regards,

Від: wiwiek.adawiyah 1 <wiwiek.adawiyah@unsoed.ac.id>
Надіслано: 23 листопада 2022 р. 10:46
Кому: v.matiukhina@manuscript-adminsystem.com
Тема: MA6929: Author's response to final decision

Dear Chief Editor

Thank you for accepting our manuscript to be published in issue 2022 of the journal "Environmental Economics", we will pay the APC, using credit card and let you know once it is done. I herewith enclosed the latest version of our article as we cannot upload it in the manuscript administration system. This new manuscript have included all eleven authors based on the names uploaded in the manuscript systems. Please let us know if you agree with this new manuscript with all eleven authors as uploaded in the system.

Regards,
Prof. Wiwiek Rabiatul Adawiyah, B.Acc., MSc, PhD
Faculty of Economics and Business
Jenderal Soedirman University
Jl. Prof. Dr. HR. Boenyamin 708 Purwokerto 53122
Office Telp. +62-281-637970 Faks. +62-640268
Web:fe.unsoed.ac.id

Satu lampiran • Dipindai dengan Gmail

MA6929m1_Manuscript Supriyanto.docx

WORD COUNT	8093	TIME SUBMITTED	03-NOV-2022 08:22AM
		PAPER ID	92236210

Economic Growth and Environmental Degradation Paradox in ASEAN: A Simultaneous Equation Model with Dynamic Panel Data Approach

Supriyanto[1]
supriyanto2505@unsoed.ac.id
Wiwiek Rabiatul Adawiyah[2]
Arintoko[2]
[1] Faculty of Mathematics and Sciences Jenderal Soedirman University
[2] Faculty of Economics and Business Jenderal Soedirman University

Abstract

Economic variables are dynamic in nature. The complexity of the relationship between economic growth and environmental degradation in ASEAN is estimated using a simultaneous equation model in this paper. We examine the relationship between CO2 emissions, economic development, and government health programs, as well as control factors, using dynamic panel data from 2011 to 2020. The population, the amount of forested land, the use of renewable energy, foreign investment, the inflation rate, the total amount of foreign exchange reserves, and government health policies are just a few examples. In order to provide a reliable and accurate assessment of the long-term relationship, this research employs the Generalized Approach of Arellano-Bond Moment method. The issues of nonstationarity, endogenity, cross-error correlation, and heteroscedasticity are all dealt with by the econometric technique. Additionally, the Two Stage Least Square (2SLS) method was used to assess the results' robustness. According to the statistical results, there is a causal link between CO_2 emissions and economic growth as well as between CO_2 emissions and energy consumption. Furthermore, during the sample period, ASEAN CO_2 emissions showed a monotonically growing relationship, according to the data. Policy makers are very interested in the study's findings since they can aid in the implementation of economic measures to promote sustainable and ecologically friendly development.

Keywords: Economic growth; Energy consumption; CO_2 emissions; Simultaneous equation model; Dynamic panel data; ASEAN

JEL Classification: Q43; 044; C30; C33

Introduction

Environmental damage has become a global issue and is a common concern of people around the world. Industrial growth has contributed to widespread environmental damage, especially in recent decades, and has affected the health, ecology, and climate balance around the world (Radmehr, Henneberry, & Shayanmehr, 2021). With the rapid expansion of industry, there has been exploitation and depletion of the earth's mineral and resources, as well as environmental degradation in the form of an increase in critical land, water pollution, and air pollution. The expansion of essential land has had unfavorable effects such as flooding during the rainy season and drought during the dry season. Ten ASEAN nations were compelled to come to a regional agreement on transboundary haze pollution due to the severe effects of air pollution (Mughal, Kashif, Arif, Guerrero, & Nabua, 2021) from smog and forest fires (Thanh, Phuong, & Ngoc, 2019) (Nazeer, 2017). Energy use has both

immediate and long-term effects on environmental quality in various ASEAN nations (Haruna & Mahmood, 2018).

Environmental degradation increased as a result of the large increase in economic growth seen by numerous ASEAN nations (Thanh, Phuong, & Ngoc, 2019); (Hu, et al., 2021); (Mughal, Kashif, Arif, Guerrero, & Nabua, 2021); (Haruna & Mahmood, 2018). Due to the existence of this phenomenon, numerous studies have provided empirical evidence that economic growth will affect environmental quality changes during the early stages of development up until a certain limit is reached, after which point the condition will result in improved environmental conditions. Using a yearly data set covering the years 1980–2014, Bakhsh et al. (2017) identifies the factors that influence Foreign Direct Investment (FDI) inflows into Pakistan as well as their direct effects on environmental degradation and economic growth. CO2 gas emissions in the atmosphere are another factor that can be used to gauge the severity of air pollution. (Rizk & Slimane, 2018) analyzed the association between poverty and CO2 emissions from 146 nations between 1996 and 2014 as a kind of environmental deterioration. The major finding is that poverty and CO2 emissions have a nonlinear relationship that might cause poverty to increase and the environment to degrade. The fundamental policy advice is that all nations should strengthen their institutional foundation to reduce poverty and environmental damage (Abdouli & Hammami, 2017).

In most nations around the world, environmental deterioration is mostly caused by economic expansion and FDI (Bakhsh, Rose, Ali , & Ahmad, 2017); (Ren, et al., 2021). Through technological transfer, higher productivity, and the introduction of new managerial techniques and procedures, the flow of foreign investment serves as a direct source of capital to promote economic growth. Additionally, FDI inflows aid in the financial development of the investing nation. This suggests that FDI increases the amount of money that the financial system has access to. As a result, these funds support economic growth as well as the development of financial markets. It is also claimed that international businesses can use banking services to get loans, overdraft facilities, or to pay suppliers of semi-finished items. On the other hand, higher FDI inflows and economic expansion result in a reduction in the environment's quality.

It is impossible to ignore environmental degradation, including water and air pollution, which can jeopardize the viability of development. Engineering and compositional impacts show that more economic expansion results in higher pollution emissions (Bakhsh, Rose, Ali , & Ahmad, 2017). The scale effect demonstrates that while pollution has a detrimental impact on growth, the stock of labor and capital has a beneficial impact on Pakistan's economy. Economic expansion and FDI have a favorable and considerable impact on the capital stock in terms of the effect of capital accumulation. Even if economic expansion increases pollution, when pollution levels go beyond a

certain point, economic growth declines. As a result, solutions must be found to combat more severe air pollution. However, the majority of research is based on cross-sectional studies and very few studies have used the panel data simultaneous equation technique (Ali, Ali, & Farooq, 2021); (Rizk & Slimane, 2018); (Thanh, Phuong, & Ngoc, 2019); (Haruna & Mahmood, 2018); (Rodriguez, 2018); (Ren, et al., 2021); (Bakhsh, Rose, Ali , & Ahmad, 2017). The model, which is still the subject of discussion, calls for a substitute model with new variables, specifically fiscal and monetary policies.

Simultaneous Equation System has the characteristics that it consists of several equations (Baltagi & Liu, 2009). In addition to mathematical and phenomenal, there is a relationship between these equations (Rose, Ali, Bakhsh, Ashfaq, & Hassan, 2020). The model in this simultaneous equation system has endogenous and explanatory variables in each equation, unlike the single equation system. Explanatory variables in one equation may also be endogenous variables in another. As a result, these variables can be correlated with other explanatory variables. In this case the estimation of Ordinary Least Square (OLS) cannot be used (Gujarati, 2010) because OLS in a simultaneous equation system will produce biased and inconsistent parameter estimates. One alternative for estimation is the Two-Stage Least Square (2SLS) method, this method will produce one estimator for one parameter and standard error for each estimator (Gujarati, 2010). Several previous studies have shown that in the field of environmental economics it is possible to use a simultaneous equation system because the variables tend to have a simultaneous relationship (Omri, 2013). Based on the phenomenon, there is a relationship between economic variables so that it cannot be modeled with a simple or multiple regression model, so in this study the 2SLS method was used for factors that affect economic growth and environmental damage.

A simultaneous equation can also be used to model the relationship between economic growth and poverty alleviation over the long and short terms (Rodriguez, 2018). It was discovered through the use of the Vector Error Correction Model (VECM) that poverty reduction and economic growth in Mexico are causally related in both directions. (Ren, et al., 2021) identified the crucial commitment to achieving China's sustainable development as the primary factor impacting the carbon emissions of China's steel sector. To determine the impact of malaria on working time during the agricultural production stage, (Rose, Ali, Bakhsh, Ashfaq, & Hassan, 2020) used the Three Stage Least Squares (3SLS) simultaneous equation model on cross-sectional data gathered from 252 agricultural employees.

The following are the ways in which this research differs from earlier studies. This research examines the relationship between carbon dioxide emissions, economic growth, and national health policies in a panel of 10 ASEAN countries using simultaneous equation modeling on dynamic panel data. To the best of our knowledge, there are also still not many empirical research that apply

simultaneous equation modeling with growth rates in each ASEAN nation to examine the relationship between CO_2 and GDP on fossil-based energy consumption, total foreign currency reserves, and renewable energy use. With the help of this model, it is possible to simultaneously analyze how government policies, CO2 emissions, and economic growth are related (Saidi & Hammami, 2014). In particular, this work makes use of a model with two structural equations that allows us to look at the concurrent effects (i) CO_2 emissions, FDI, fossil fuel use, population, inflation rate, and overall reserves. impact of foreign exchange on economic expansion (ii) The impact of population expansion, economic growth, government health policies, FDI, fossil fuel consumption, and renewable energy consumption on environmental pollution. In this work, the growth rate is taken into account in the modeling approach in order to evaluate the short-run elasticity rather than the long-run.

1. Literature review

1.1.Theoretical Literature Review

A model called a simultaneous equation model has multiple equations connected to one another. As a result, it can be claimed that a variable in a simultaneous equation can play the dual roles of being both an independent variable and a dependent variable. This is possible in the simultaneous equation model. There are endogenous variables and predetermined variables in a simultaneous equation model. The predetermine variable is a variable whose value can be determined in advance but is not directly decided by the equation, whereas the endogenous variable is the dependent variable that is determined in the simultaneous equation system (non-stochastic). Exogenous variables and endogenous lag variables are the two categories into which predetermine variables fall (Gujarati, 2010).

In the simultaneous equation model, there are two kinds of equations, namely structural equations and reduced form equations. The structural equation is the original equation that describes the behavior of the relationship between the existing variables, while the reduced equation is an equation whose endogenous variables are only influenced by the predetermined variable and the error component.

The dependent variable in panel data regression is also influenced by the dependent variable in the previous period (lag 1), so the model is said to be a dynamic panel data model. In economic research, the dynamic panel data regression model is more suitable to be used in finding the relationship between economic variables. This dynamic panel data model can be seen from the lag of the dependent variable between the independent variables. The dynamic panel data model can be written in the following equation (Gujarati, 2010):

$$Y_{i,t} = \delta Y_{i,t-1} + \mathbf{X}'_{i,t}\boldsymbol{\beta} + u_{i,t}, \qquad i = 1,2,\dots,N \;;\; t = 1,2,\dots,T \qquad \dots\dots\dots\dots \quad (1)$$

where N denote number of observations, T is number of time periods, $Y_{i,t}$, dependent variable for individual i at time t, $Y_{i,t-1}$, independent variable for individual i at time t (lag 1), $\mathbf{X}'_{i,t}$ is vector transpose of the independent variable for the i-th individual on t-th time measuring 1 x k, δ is the intercept coefficient which is a scalar, $\boldsymbol{\beta}$ is independent variable parameter vector of size k x 1, and $u_{i,t}$ is component error model for individual i at time t.

The problem that occurs in the dynamic panel data model is when $y_{i,t}$ is a function of $u_{i,t}$ then the result $y_{i,t-1}$ is also a function of $u_{i,t}$. As a result, the independent variable on the right side of $y_{i,t-1}$ correlated with each other $u_{i,t}$ if the solution uses the usual panel data estimation method, it will cause the results to be biased and inconsistent. To overcome this problem, there are two approach methods that can provide unbiased and consistent results, namely GMM Arellano Bond and GMM Blundel Bond. But before that, it is necessary to use an instrumental variable method to facilitate the estimation of the GMM method.

Over the past 20 years, a number of theoretical studies have concentrated on the relationship between political activities, CO2 emissions, FDI inflows, and economic development. The neo-classical growth model postulates that FDI inflows can boost the capital stock, which in turn quickens economic expansion. The new growth hypothesis then contends that both long- and short-term economic development are aided by the technological advancements brought forth by FDI inflows. However, because of policies of liberalization, deregulation, and privatization, FDI slows down economic growth. Furthermore, financial development and economic growth can happen independently of one another. A higher rate of economic expansion, however, has been attained at the expense of environmental deterioration, according to another theoretical research.

The Environmental Kuznets Curve (EKC) is a tool for analyzing the relationship between government and environmental policies. This suggests that as financial development increases industrial activity to achieve profitable growth, environmental degradation increases during the primary stage. However, as financial development advances to the next stage, investments in environmental projects and access to cutting-edge technology are made to slow down environmental degradation. However, the environment was considered as another element of production in the traditional trade perspective on comparative advantage. However, this viewpoint contends that to increase FDI inflows, developing nations should adopt lax environmental standards. Furthermore, wealthy nations enforce rigorous environmental laws to cut down on pollution output, which promotes FDI into developing nations or places with lax environmental laws. Additionally, the environment and FDI inflows are thought to be positively correlated, according to the Neo-

Technology Trade Theory. This suggests that because of stringent environmental rules, FDI inflows utilize technology regarding the environment.

In the early 1980s, the theoretical links between governmental policy and economic growth (as measured by FDI and GDP proxies) were examined. To encourage investment in cutting-edge technology, a structure for financial development is necessary yet insufficient. Furthermore, according to some studies, FDI inflows and financial developments are tightly associated. This implies that FDI can help countries with more developed financial markets benefit more from economic growth promoting FDI.

1.2. Analyzing empirical literature and formulating hypotheses

Economic growth is proxied by the variables of GDP (Mughal et al., 2021), population (Rizk & Slimane, 2018), FDI (Ren, et al., 2021), fuel consumption (Ali, Ali, & Farooq, 2021);; (Rodriguez, 2018) has been widely used by researchers in the field of economics. Indicators of the success of a country's economy are reflected in the high GDP, the increased flow of investment into the country, stable inflation and interest rates and ultimately the implications for the creation of new jobs. Under the pretext of accelerating the development process in an effort to catch up with developed countries, developing countries (Ali, Ali, & Farooq, 2021) carry out various maneuvers in achieving high economic growth without carrying out further studies of changes in the large-scale transformation of the economic system so fast (Rizk & Slimane, 2018).

Many studies have been conducted on the impact of economic growth on environmental degradation. The effect of economic growth on CO2 emissions, waste, and foreign investment in Pakistan (Bakhsh, Rose, Ali , & Ahmad, 2017) suggests that increased economic growth leads to more polluting emissions. The influence of foreign investment and labor has a positive effect on Pakistan's economic growth while pollution has a negative effect on environmental quality. This also happened in several other developing countries (Ali, Ali, & Farooq, 2021), such as Vietnam (Hu, et al., 2021), Malaysia (Haruna & Mahmood, 2018), Nigeria, and Mexico (Rodriguez, 2018). For the ASEAN Region (Thanh, Phuong, & Ngoc, 2019); (Mughal, Kashif, Arif, Guerrero, & Nabua, 2021) in general, economic growth has an impact on environmental pollution (Khan, Peng, & Li, 2019). Therefore, we hypothesize:

H1: There are contributions of CO2 emissions, government policies in the health sector, FDI, consumption of fossil fuels, population, inflation rates, and total foreign exchange reserves to economic growth in ASEAN countries.

Over the past two decades, a number of empirical studies have examined the connection between FDI inflows, economic growth, the environment, and governmental policy. A similar

quadratic association between income and CO2 emissions is demonstrated by (Thanh, Phuong, & Ngoc, 2019). This suggests that China has an inverted U curve. In line with that, (Rodriguez, 2018) tested the EKC hypothesis in Malaysia from 1980 to 2009 using the auto-regressive distributed lag (ARDL) methodology. Using the fixed-effect model and the generalized methods of moment (GMM) methodology, (Haruna & Mahmood, 2018) discovered that there is a unidirectional causality between GDP and CO2 emissions.

In addition, (Nazeer, 2017) discovered that Indonesia is one of the countries where there is an inverse U-shaped link between government policies and carbon emissions. More specifically, they draw attention to the fact that as the financial sector matures, government initiatives initially result in a drop in CO2 emissions. (Hu, et al., 2021) have discovered that Pakistan's CO2 emissions that are reduced because of financial factors are significantly smaller than those that are increased as a result of rising per capita income. The hypotheses to be tested are:

H2: The influence of economic growth, government policies in the health sector, forest area, FDI, consumption of fossil-based energy, population, consumption of renewable energy on environmental pollution.

In observing development that is increasingly forgetting about natural preservation, further research is needed on the extent to which the use of the environment as natural capital is efficient (Hu, et al., 2021), what are the consequences of environmental degradation, how is the concept of environmental sustainability associated with policies or regulations that apply to the environment. appropriate to minimize the occurrence of environmental degradation in the context of sustainable development (Nazeer, 2017). Models of the relationship between economic growth (Breunig & Majeed, 2019) and environmental degradation have been formulated by many previous researchers, both using regression models (Ali, Ali, & Farooq, 2021); (Rizk & Slimane, 2018); (Haruna & Mahmood, 2018), panel data (Rizk & Slimane, 2018); (Mughal, Kashif, Arif, Guerrero, & Nabua, 2021); (Hu, et al., 2021); (Rose, Ali, Bakhsh, Ashfaq, & Hassan, 2020); (Nazeer, 2017), and 3SLS (Bakhsh, Rose, Ali , & Ahmad, 2017).

H3: There is a simultaneous relationship between economic growth and environmental pollution with support from government policy factors in the health sector, forest area, FDI, consumption of fossil-based energy, population, consumption of renewable energy, inflation rate, and total foreign exchange reserves.

Current research on ASEAN nations has produced a mixed bag of findings. As a result, it is challenging to offer the right guidance and counsel to decision-makers as they develop each nation's foreign, environmental, economic, and financial policies. One possible explanation is that prior research did not consider the four-way interaction between each country's economic growth, FDI

inflows, CO2 emissions, and government policies. The simultaneous equation model is used in this instance to analyze panel data from 10 ASEAN nations from 2011 to 2020.

2. Methodology and Data

2.1. Econometric Model

This research model uses a production function approach to explain the impact of CO2 emissions, fossil fuel energy consumption (FFEC), total foreign exchange reserves (TR), inflation (INF), government budget for health (DGGH), foreign investment (FDI), and population (POP) to economic growth (GDP) in the form of a function model:

$$GDP = f\left(CO2, FFEC, TR, \text{Inf}, \text{DGGH}, FDI, Pop\right) \quad \ldots\ldots\ldots \quad (2)$$

Several researchers, including (Bakhsh, Rose, Ali , & Ahmad, 2017); (Haruna & Mahmood, 2018); (Hu, et al., 2021), included energy consumption, population growth, and CO2 emissions as variables in their empirical models to examine how these two factors affected economic growth. While they generally discover that energy use and CO2 emissions contribute to the explanation of economic expansion. In a different study, it was demonstrated that foreign investment had a statistically significant impact on economic growth (Ali, Ali, & Farooq, 2021); (Bakhsh, Rose, Ali , & Ahmad, 2017); (Ren, et al., 2021). In line with previous research, (Mughal, Kashif, Arif, Guerrero, & Nabua, 2021) said that fiscal and monetary policies also affect the country's economic growth. Thus, the model proposed in Equation (2), is consistent with the wider literature on the determinants of economic growth cited above. Functional relationship between CO2 emissions, GDP, government budget for health (DGGH), foreign investment (FDI), fossil fuel energy consumption (FFEC), population (POP, forest area (FA), and use of renewable energy (REC) can be represented in Equation (3) as follows (Haruna and Mahmood, 2018):

$$CO2 = f\left(GDP, DGGH, \text{FDI}, \text{FFEC}, \text{Pop}, \text{FA}, \text{REC}\right) \quad \ldots\ldots\ldots \quad (3)$$

In the case of economics, variables that have a two-way relationship are often encountered. This two-way relationship that influences each other can be summarized in a system of simultaneous equations. Almost all approaches in macroeconomics have a simultaneous nature. The identification of a simultaneous equation with the order conditions provides information that an equation is exactly identified or overidentified. Based on the order conditions, the model is said to be identified if the equations (2) and (3) meet the requirements if the model shows $K-k \geq m-1$ then called over identified. If $K-k = m-1$ then it is called exactly identified and if $K-k < m-1$ then the equation is said to be unidentified.

Due to the correlation between endogenous variables and disturbances in simultaneous equations, the OLS estimator will result in a biased and unstable estimate. An alternative estimation method is needed which is called the 2SLS method. The 2SLS method is the application of OLS in two stages. Simultaneous test (Haussman test) is needed to test whether explanatory endogenous variables are correlated with disturbance or not. In data processing using panel data, there are several stages of testing that aim to determine the best model to be used in a panel data study (Gujarati, 2010). The three models contained in panel data regression processing are the common effect model, the fixed effect model, and the random effect model. In addition, there are 3 stages of testing the model selection on the panel data, namely the Chow test, Hausmann test, and finally the LM test. The Chow test is useful for testing the model selection between the common effect model and the fixed effect model. The Hausman test is used to test the model selection between the fixed effect model and the random effect model. While the LM test is used to test the model selection between the random effect model and the common effect model. After knowing the best model to be used in the study, hypothesis testing will be carried out such as the coefficient of determination and partial and simultaneous significance tests.

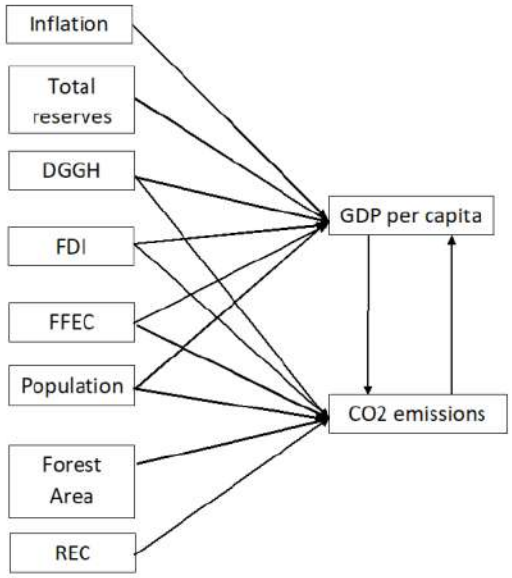

Figure 1. Simultaneous relationship model between variables

Two basic specifications of the panel data simultaneous equation model are as follows.

The panel data simultaneous equation model for economic growth is

$$GDP_{it} = \alpha_0 + \alpha_1 CO2_{it} + \alpha_2 Inf_{it} + \alpha_3 TR_{it} + \alpha_4 DGGH_{it} + \alpha_5 FDI_{it} + \alpha_6 FFEC_{it} + \alpha_7 Pop_{it} + \varepsilon_{1it} \quad \ldots \quad (4)$$

Simultaneous equation model of panel data for air pollution is:

$$CO2_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 DGGH_{it} + \beta_3 FDI_{it} + \beta_4 FFEC_{it} + \beta_5 Pop_{it} + \beta_6 FA_{it} + \beta_7 REC_{it} + \varepsilon_{2it} \ldots \quad (5)$$

The classical assumption test will be carried out in three stages, namely the classical assumption test of heteroscedasticity, autocorrelation, and multicollinearity. These three stages must be met so that the data used is tested for validity. Heteroscedasticity resulted in unbiased coefficient values, but the variance of the estimated regression coefficients was no longer minimal. The existence of Heteroscedasticity can be tested by the Harvey test. To prove the existence of heteroscedasticity with the white test, it can be done by comparing the value of n (amount of data) and R-square of the unadjusted R-square value in the auxiliary model. Autocorrelation shows the regression residual that is not independent from one observation to another. Autocorrelation can arise from inappropriate specification of the relationship between endogenous variables and explanatory variables. The presence of autocorrelation can be detected through the Durbin Watson Test. Multicollinearity arises when the independent variables are correlated with each other. Multicollinearity is the relationship between independent variables, which is a condition of a strong correlation between independent variables or vice versa. To determine the existence of multicollinearity, it can be determined through a correlation matrix or regression between independent variables in the equation model.

2.2. Data

The data used are annual data for GDP per capita (constant 2015 US$), CO2 gas emissions (metric tons per capita), Inflation, Total reserves (including gold, current US$), Fossil fuel energy consumption (% of total), Renewable energy consumption (% of total final energy consumption), Population (total), Foreign direct investment, net inflows (BoP, current US$), Forest area (sq. km), and Domestic general government health expenditure (% of general government expenditure), which was collected for the period 2011 - 2020, sourced from the World Bank's World Development Indicators. To estimate the model, we divide the variable by the population to get the variable in per capita terms. The study covered 10 ASEAN countries which were selected based on data availability. These countries are Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Laos, Philippines, Singapore, Vietnam, and Thailand.

Descriptive statistics of various variables for individuals as well as for panels are presented in Table 1.

Table 1. Description of research variable data per ASEAN countries

Country	Descriptive statistics	CO2 emissions	GDP per capita	Inflation	Total reserves	Fossil fuel energy consumption
Brunei	Mean	16.91835346	31539.51106	-1.007741886	3527561554	99.99854192
	SD	1.44032045	1659.323029	10.76447439	438897667.4	0.002340927
	Maximum	19.35389761	34244.2069	20.18050542	4272696958	100
	Minimum	14.41262527	29802.78288	-17.61280313	2583674788	99.99437899
Cambodia	Mean	0.478608348	1194.607567	2.230207326	10352256400	29.14059296
	SD	0.150636891	172.9710883	1.434629544	6138256293	2.498229959
	Maximum	0.710207176	1441.179228	3.475254586	21328475093	32.96813121
	Minimum	0.335613209	940.1118195	-0.865696886	4061785157	24.43280442
Indonesia	Mean	1.900583372	3389.71266	3.730182313	1.17246E+11	65.14695824
	SD	0.148729516	350.9983597	2.174092191	11633834111	0.886518696
	Maximum	2.178461553	3877.382977	7.465943034	1.35916E+11	67.15478782
	Minimum	1.653210477	2849.354985	-0.456130066	99386826239	63.80707707
Laos	Mean	1.197511798	2180.408249	4.637573877	1131583292	90.49812731
	SD	0.95346821	320.375924	2.920573489	140781847.4	5.227415579
	Maximum	2.662148349	2579.253661	10.4687176	1392600619	94.63801786
	Minimum	0.413100759	1687.147369	1.852096761	916030473.8	84.14968302
Malaysia	Mean	7.273359125	10026.20971	5.103978795	1.12905E+11	96.73070066
	SD	0.383396334	959.6792015	3.150672322	17133611020	0.200188553
	Maximum	7.757158614	11414.5787	8.677799133	1.39731E+11	96.94482833
	Minimum	6.526762285	8550.154638	-2.651352414	94481267074	96.21646697
Myanmar	Mean	0.326829819	1272.100612	1.563082258	6189934531	27.26229528
	SD	0.166864829	219.8750129	1.870692999	1503800868	4.02800422
	Maximum	0.605492803	1586.90232	5.41240809	8835555373	31.70408856
	Minimum	0.15183969	962.9954522	-0.77780922	4509489139	20.8796747
Philippines	Mean	1.049645955	3064.511787	1.998413176	84314479934	58.2433612
	SD	0.180425659	389.9833881	1.401186097	9750849968	1.852358853
	Maximum	1.33369096	3664.79067	3.918805776	1.0999E+11	61.41213905
	Minimum	0.838832482	2484.489204	-0.71968279	75123089217	56.18237608
Singapore	Mean	3.672530757	56228.09953	0.732192976	2.78505E+11	97.52192547
	SD	0.179703423	3705.552157	1.977278357	36126714156	1.388649317

	Maximum	3.851520326	61173.90477	3.347638991	3.69834E+11	98.71373917
	Minimum	3.309563004	50685.2962	-2.91966152	2.43798E+11	94.00615626
	Mean	8.256578092	5946.451584	1.544289408	1.89964E+11	80.83046839
	SD	0.228147614	450.4341067	1.256683626	32617529928	0.763163079
Thailand	Maximum	8.636708073	6617.542822	3.74309812	2.58104E+11	82.05719879
	Minimum	7.785349708	5182.042369	-1.066259571	1.5646E+11	79.99305669
	Mean	1.975363601	2170.813333	5.209557239	44166944747	64.92374886
	SD	0.408992745	329.9848058	6.415768699	25636306572	4.215425552
Vietnam	Maximum	2.698805922	2655.767774	21.26065929	94833616150	70.32817751
	Minimum	1.512419303	1733.311285	-0.190788132	13539119001	58.26328476

(continuation…….)

Country	Descriptive statistics	Renewable energy consumption	Population	Foreign direct investment	Forest area	Domestic general government health
	Mean	0.00441	416580.1	515039321.8	3800	6.016399526
	SD	0.005962	14804.90325	235866554.6	0	0.703611169
Brunei	Maximum	0.0149	437483	864905527.5	3800	7.13899708
	Minimum	0	393687	150550827.3	3800	5.12074184
	Mean	66.41803017	15637515.7	2503604406	89617.67	6.603743457
	SD	3.426905774	735975.8954	778699496.1	7336.536185	0.445018657
Cambodia	Maximum	71.32559967	16718971	3663032999	102407.48	7.16890764
	Minimum	61.46900177	14541421	1538883425	80683.7	5.70839548
	Mean	29.17991962	259691144.1	19802486640	951839.9	6.634999848
	SD	4.794287411	9580810.416	5816882734	21901.56537	2.028809953
Indonesia	Maximum	38.1792984	273523621	25120732060	987329.4	8.67722607
	Minimum	20.86389923	245115988	4541713739	921332	3.96187973
	Mean	56.52980042	6801970.5	925492889.5	167507.5	3.392989075
	SD	8.454153332	313339.7572	391317753.9	1044.539372	1.074015763
Laos	Maximum	66.45030212	7275556	1693080811	169060	4.70540714
	Minimum	41.88410187	6347564	300743507.1	165955	1.76665986
	Mean	3.30539999	30495877.2	10039906258	192359.66	7.841254377
Malaysia	SD	1.255560672	1248377.241	2941420592	1231.822903	0.875816525

	Maximum	5.310500145	32365998	15119439204	194642.2	8.76370335
	Minimum	1.95539999	28650962	4313013745	190509.64	6.51518917
	Mean	74.31700974	52780957.3	2578749364	298475.87	3.352140916
Myanmar	SD	9.381750194	1142156.287	1127972162	8771.43153	0.978610652
	Maximum	85.58110046	54409794	4804272487	311512.88	4.97641993
	Minimum	60.11109924	50990612	1333856137	285438.9	1.64683187
	Mean	26.96183014	102746642.3	6408021984	70315.96	7.234985352
Philippines	SD	2.757161472	4714706.933	2862276671	1056.257297	0.770412409
	Maximum	31.22660065	109581085	10256442399	71885.9	8.19224167
	Minimum	23.2201004	95570049	2007150725	68746.06	6.07696486
	Mean	0.582879996	5514760.1	76702277498	164.5405	13.86876393
Singapore	SD	0.098034083	171487.1629	21619951957	6.429658385	0.936438621
	Maximum	0.727299988	5703569	1.20439E+11	174.866	15.33037758
	Minimum	0.47330001	5183688	49155657316	155.7	11.97459507
	Mean	22.95395012	68768727.7	7980512101	200054	14.28420448
Thailand	SD	0.590424479	774839.5156	4656322353	741.6138558	0.429262561
	Maximum	24.12770081	69799978	15935960665	200706	15.06272507
	Minimum	22.26580048	67518379	2473685996	198730	13.73816299
	Mean	33.83905964	93140456.3	11981800000	141456.34	9.3609869
Vietnam	SD	4.602318905	2870322.867	3333290193	4050.993674	0.848983178
	Maximum	38.10189819	97338583	16120000000	146430.9	10.21770763
	Minimum	23.49180031	88871384	7430000000	135228.2	7.89614296

On average, the highest level of CO2 emissions per capita (16,918), and consumption of fossil fuel energy (99.998%) occurred in Brunei Darussalam, while GDP per capita (56,228.10), total foreign exchange reserves (278,505,095,437.544) and FDI (76,702,277,498.4464) were highest in Singapore. The highest average inflation occurred in Vietnam (5.21%), the largest population (259,691,144) and forest area (951,839.9) in Indonesia, the users of renewable energy in Myanmar (74,317), and the highest government budget for health in Thailand (14,284%). In contrast, the lowest average for CO2 emissions (0.3268), fossil fuel consumption (27.262%), and Health budget (3.352%) occurred in Myanmar, GDP (1194.608) occurred in Cambodia, inflation (-1.008%), energy consumption Renewable resources (0.0044%), total population (416580), and FDI (515039321.7593) occur in Brunei Darussalam, the country's total foreign exchange reserves (1131583292.036) are in Laos, and forest area (164.5405) is in Singapore.

3. Results and Discussion

3.1. Model Identification

Before estimating the parameters, it is necessary to identify the problem first, to see if the equation model formed can be used using the Two Stage Least Square approach. In identifying these problems, you can use order condition tests. The test results with order conditions are described in Table 2.

Table 2. Problem Identification with Order Conditions

Equation Model	*K*	k	M	m
Economic growth	8	6	2	1
Environmental degradation	8	6	2	1

Based on the results obtained in Table 2, it shows that the Equation (4) and Equation (5) models are over identified equations, which means that the two models are correctly identified so that the Two Stage Least Square approach can be used.

3.2. Panel Unit Root Test

To determine if the pertinent variables in a panel data analysis are stationary, the panel unit root test must first be run. In this work, Levin et al. used the LLC approach for the panel unit root test. In the two unit root tests mentioned above, the null hypothesis is that there is a unit root (i.e., the variable is not stationary), and the alternative hypothesis is that the series has no unit root (that is, the variable is stationary). Table 3 displays the outcomes of the panel unit root test for the variable level. All variables at the level can be demonstrated to be statistically significant in the LLC test, proving that they are all integrated and stationary.

Table 3. Panel unit root test results for research variables

Variable	LLC		orde
	t test	p-value	difference
GDP	-2.85314	0.0022	0
CO2	-4.84032	0.0000	1

Inflation	-3.53321	0.0002	1
Total reserves	-7.67206	0.0000	1
Fossil fuel energy consumption	-2.33517	0.0098	1
Renewable energy consumption	-3.3085	0.0005	1
Population	-17.8459	0.0000	0
Foreign direct investment	-4.90609	0.0000	1
Forest area	-1.69936	0.0446	0
Domestic general government health expenditure	-4.56086	0.0000	0

3.3. Hausman Test

Hausman test aims to prove the existence of a simultaneous relationship to the two independent equations (Gujarati, 2010). The hypothesis for the Hausman specification test is H0 which means that there is a simultaneous relationship between the GDP equation and CO2 emissions and H1 which means that there is no simultaneous relationship between the GDP equation and CO2 emissions. The test statistic used is the t-test with the rejection area if the p-value of the residual variable is less than 0.05 then H0 is rejected. Hausman test results are shown in Table 4 below.

Table 4. Hausman specification test results

Dependent variables	Residual variables	p-value
GDP	resCO2	0.7687
CO2	resGDP	0.7697

From Table 4, because the p-value for the resCO2 and resGDP variables is greater than 0.05, then H0 fails to be rejected. Thus, it can be concluded that the GDP equation has a simultaneous relationship with the CO2 equation.

3.4. Model Estimation Using Generalized Method of Arellano-Bond Moment

The estimation of the equation uses the GMM estimation which consists of two equations (4) and (5). Based on the calculation results, the panel data simultaneous equation models for the GDP and CO2 equations are obtained as shown in Table 5 and Table 6 below.

Table 5. The estimation results of the regression coefficient with the dependent variable log(GDP)

Variables	Coefficient	Std. Error	t-Statistic	Prob.
log(GDP)(-1)	1.061778	0.309590	3.429633	0.0009
CO2	0.016286	0.005945	2.739297	0.0074
DGGH	-0.017750	0.005837	-3.041210	0.0031
log(FDI)	0.218758	0.051567	4.242200	0.0001
FFEC	0.005423	0.000736	7.367219	0.0000
log(POP)	-0.516775	0.034506	-14.97636	0.0000
Inflation	-0.006128	0.002878	-2.129145	0.0359
log(TR)	0.383726	0.051116	7.506975	0.0000

Table 6. The estimation results of the regression coefficient with the dependent variable CO2 emissions

Variables	Coefficient	Std. Error	t-Statistic	Prob.
CO2(-1)	30.60480	12.84430	2.382753	0.0192
log(GDP)	5.535230	2.686844	2.060124	0.0422
DGGH	0.418852	0.059462	7.043982	0.0000
log(FA)	4.064589	0.475518	8.547710	0.0000
log(FDI)	-2.509603	0.622581	-4.030966	0.0001
FFEC	0.078115	0.012013	6.502819	0.0000
Log(POP)	4.846382	0.832686	5.820179	0.0000
REC	-0.121500	0.031691	-3.833878	0.0002

If there is a relationship between the variables in an equation model, it will be found via parameter significance testing. Results of the parameter significance test are as follows:

1. Test the significance of the parameters simultaneously

The parameter significance test is also used to examine whether the independent variable has an impact on the dependent variable. The following are the results of the simultaneous parameter significance test shown in Table 7.

Table 7. Simultaneous significance test results

Equation model	F-statistic	Chi-square	p-value
Log(GDP)	13311.64	5324.658	0.0000
CO2	4038.371	1615.348	0.0000

Based on Table 7. It can be seen that the p-value of the two equations, namely GDP and CO2 is less than 0.05, thus making the independent variables of the two models have a significant effect on the dependent variable (H0 is rejected).

2. Test the significance of the parameters partially

To find out whether the independent variable only has a partial impact on the dependent variable, perform the partial parameter significance test. Based on Tables 5 and 6, it turns out that all independent variables have p-values that are less than 0.05, so it is concluded that all independent variables have a significant effect on the equation (3) and (4) models.

3.5. Classic assumption test

The assumptions used in this study are normality test, Arellano Bond (AB) test and Sargan test.

1. Normality Test

The purpose of the normality test is to determine whether or not the independent and dependent variables in a regression model have a normal distribution. To detect whether the model is normally distributed or not, the Jarque-Bera test can be used (Gujarati, 2010).

Table 8. Simultaneous significance test results

Equation model	Jarque-Bera -statistic	p-value
Log(GDP)	0.790035	0.673668
CO2	1.841905	0.093268

From Table 8, information is obtained that the residuals of the two models are normally distributed.

2. Arellano Bond (AB) Test

The Arellano Bond test aims to test the consistency of the model. In the Arellano Bond test, there are two tests with different functions, namely the ab(1) test which serves to determine the influence of individual effects between observations and the ab(2) test which functions to determine

whether or not there is a correlation between the first difference error in the i-th observation (Gujarati, 2010).

Table 9. Arellano Bond Test's Result

dependent variable	Test order	m-statistic	rho	SE(rho)	p-value
Log(GDP)	AR(1)	-5.971336	-0.049369	0.008268	0.0000
	AR(2)	-0.287108	-0.002059	0.007171	0.7740
CO2	AR(1)	-6.039716	-0.001869	0.000309	0.0000
	AR(2)	-0.105762	-0.000032	0.00030	0.9158

Based on Table 9, the p-value for ab(1) both models is 0.000, so the decision rejects H0 and it can be concluded that the GDP and CO2 equation model does not have individual effects between variables. For the results of the ab(2) test, the P-values obtained are 0.774 and 0.9158 so that the decision H0 is not rejected and it is concluded that there is no lag effect of the dependent variable on the first difference error in the GDP and CO2 models. Because the ab(1) and ab(2) tests are met, it can be concluded that the GDP and CO2 equation models are consistent.

3. Sargan Test

The Sargan test is used to evaluate the validity of using instrument variables that are more numerous than the parameters that are estimated (over-identified) (Gujarati, 2010). The following are the results of the Sargan test of the two equation models presented in Table 10.

Table 10. Sargan test results

Equation model	Prob (J-statistic)
Log(GDP)	0.2901
CO2	0.2927

Based on Table 10, the results show that both models have a p-value of more than 0.05. The GDP equation model has a p-value of 0.2901, while the CO2 equation model has a p-value of 0.2927 so the decision is to fail to reject H0 and it can be concluded that the two models have no problem with the validity of the instrument variables.

4. Discussion

Based on Table 5, it is shown that the coefficient of lag indicator of economic growth (GDPt-1) has a positive and statistically significant effect. Thus, every country in the ASEAN Region can take appropriate macroeconomic policies with a backward look in achieving high and sustainable economic growth. FDI inflows per capita have a positive and significant effect on GDP per capita for the panel results. Every 1% increase in FDI, will increase GDP 0.219 times at the time of ceteris paribus. This shows that economic growth is elastic to FDI inflows. This implies, therefore, that the technological changes brought about by FDI inflows promote economic development in the long run. This indicates that the influence of foreign investment has not been able to encourage economic growth for all countries in the ASEAN Region. Although FDI is still only focused on a few countries, it has a positive impact on economic growth in the ASEAN Region. These results are in line with (Hu, et al., 2021), (Bakhsh, Rose, Ali , & Ahmad, 2017); (Ren, et al., 2021). Each country can take appropriate macroeconomic policies by looking backwards in achieving high and sustainable economic growth.

In the case of Malaysia, it shows that there is an indirect relationship between CO2 emissions on energy consumption and of energy consumption on economic growth. Meanwhile, Singapore shows that economic growth and energy consumption show no relationship to CO2 emissions, but openness and industrialization have causality in CO2 emissions. This proves that Singapore is able to maintain economic growth without causing environmental damage. The environmental Kuznets Curve in Malaysia shows that it has not yet passed a turning point, but Singapore has passed a critical point, and is already in a state of environmental improvement while continuing to carry out economic development (Thanh, Phuong, & Ngoc, 2019). From a study in Pakistan CO2 emissions will increase as economic growth increases. The reason behind this relationship between economic growth and CO2 emissions is that large amounts of carbon-intensive energy are used to carry out economic activities in various sectors (Bakhsh, Rose, Ali , & Ahmad, 2017) and (Malik, 2021).

Another variable that affects the indicators of economic growth is the inflation indicator. An increase in the inflation indicator by one percent will be responded to by a decrease in economic growth by 0.006128 percent at the time of ceteris paribus. This result is in accordance with (Ren, et al., 2021), showing that inflation is one of the factors that drive economic growth. The long-run multiplier on the inflation rate variable on economic growth indicators is much larger than the short-run multiplier. The phenomenon of inflation for developing countries such as Indonesia is still a threat to economic stability. The tendency of rising prices generally reflects the level of inflation that occurs in a country. The consumer price index is an indicator used to describe the price movement. Changes in public consumption patterns in the long term trigger an increase in aggregate demand so as to

encourage an increase in the inflation rate. In the long term, an increase in a country's economic growth reflects an increase in people's income and consumption. The increase in demand was followed up by business actors by increasing their production output. With the addition of output, the costs incurred for the production process become greater, causing an increase in the selling price of the product. If in a relatively long time most of the traders do the same thing, then the increase in the prices of consumer goods in general can encourage an increase in inflation.

The role of government spending in the health sector has a positive effect on boosting economic growth. Government spending in terms of health has a positive effect in attracting foreign investment. This will indirectly increase economic growth so that welfare will increase. The benefits for investors in addition to quality labor, the region will become a big consumer due to the increasing welfare. An increase in government spending (DGGH) by one percent causes an increase in economic growth of 0.01775 percent at the time of ceteris paribus. In the long term, an increase in government spending can increase foreign investment by 1.203 percent. (Nazeer, 2017) also shows that government spending has a positive and statistically significant effect on increasing economic growth. The same thing results from research (Nazeer, 2017), concluding that simultaneously government spending has a positive effect on investment development in the ASEAN region.

The empirical findings for the global panel are shown in Table 6, and they demonstrate that energy consumption significantly reduces CO2 emission levels at the 1% level. This implies that increased energy use may result in increased CO2 emissions. The economic growth is significantly influenced favorably by panel estimates. A robust energy policy is required to promote sustained economic growth because energy is a key component of economic growth. These findings concur with those of (Thanh, Phuong, & Ngoc, 2019). In terms of the pollutant variable, it was discovered that CO2 emissions have a sizable impact on worldwide panel economic growth. This demonstrates that a 1% increase in CO2 emissions causes a 0.005423% rise in economic growth.

For almost all nations, population increase is statistically significant and has a considerable negative influence on economic growth at the 1% level. Population growth raises the level of government policies, including health, fuel, and other subsidies. Additionally, fuel consumption has a 1% favorable impact on CO2 emissions. If there is a population of 1%, in the short term it will cause a slowdown in economic growth of 0.516775%. on the other hand, an increase in population by 1% will increase CO2 emissions by 4.846382%.

5. Conclusion and Policy Implication

The purpose of this study is to apply GMM estimations for the years 2011 to 2020 to data from 10 ASEAN countries in order to examine the relationship between economic growth and CO2 emissions. The major findings demonstrate a reciprocal relationship between CO2 emissions and economic expansion. Economic expansion and CO2 emissions are in line with the hypothesis. Our empirical findings also confirm the existence of a unidirectional causal relationship between economic growth and CO2 emissions.

The primary theoretical and policy ramifications of this research can be summarized as follows. The feedback between FDI inflows and economic growth indicates a causal relationship between the two, and the ongoing increase in FDI inflows can help the economy by fostering growth through knowledge transfer, ripple effects, greater productivity, and the introduction of new processes. Therefore, by fostering an environment that encourages FDI inflows, FDI can be enhanced at the expense of economic growth. As a result, it is imperative that these nations think about more responsible policies that may include lowering obstacles that prevent local businesses from forging meaningful connections, expanding their access to inputs, technology, and financing, and streamlining the processes involved in the purchase of inputs. These findings support both the new growth theory and the neo-classical growth theory. These theories specifically show that FDI inflows can enhance capital stock, which in turn improves economic growth. They also find that FDI inflows can bring about technological breakthroughs that can promote economic development in the long and near term.

Second, the feedback theory between economic growth and CO2 emissions contends that the two phenomena are commonly impacted and determined simultaneously. According to the global panel, countries must establish environmental regulatory laws to regulate carbon emissions because there is a positive causal relationship between CO2 emissions and economic growth. Additionally, there is a direct causal link between growth and CO2 emissions. According to the worldwide panel, this suggests that greater economic growth causes environmental deterioration. By promoting coordinated knowledge and technology transfer of environmentally beneficial technologies with foreign enterprises, policy makers are drawn to tight environmental restrictions to attract foreign direct investment and prevent pollution. This outcome is consistent with the theory of comparative advantage's classical trade perspective and takes the environment into account as a further factor of production. However, this viewpoint contends that in order to increase FDI inflows, developing nations should adopt lax environmental standards.

Third, economic growth and CO2 emissions are causally linked in ASEAN countries in a two-way fashion. This suggests that the worsening of the environment due to economic growth. High economic growth currently contributes to environmental degradation, and declining economic growth

creates unemployment, which can place significant strain on the economies of ASEAN member states. In order to increase their efforts to combat global warming, governments should cut CO2 emissions without compromising either short- or long-term growth. In reality, it will promote environmentally friendly sustainable economic growth. Pollutant emissions, on the other hand, are detrimental to economic growth, suggesting that environmental degradation is a causal factor in economic growth. Furthermore, persistent environmental degradation can have a negative externality on the economy due to its effects on human health and can eventually lower productivity, which is consistent with the Kuznets environmental curve theory.

AUTHOR CONTRIBUTIONS

Conceptualization: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko

Data Curation: Supriyanto

Formal Analysis: Supriyanto

Investigation: Herman Sambodo and Nunik Kadarwati

Methodology: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko

Project Administration: Lilis Siti Badriah, Dijan Rahajuni. and Nunik Kadarwati

Resources: Dijan Rahajuni and Rakhmat Priyono

Software: Supriyanto

Supervision: Lilis Siti Badriah. Herman Sambodo and Hary Pudjianto

Validation: Lilis Siti Badriah and Herman Sambodo

Visualization: Oke Setiarso and Nunik Kadarwati

Writing – Original Draft: Supriyanto

Writing – Review and Editing: Wiwiek Rabiatul Adawiyah, Arintoko

REFERENCES

Abdouli, M., & Hammami, S. (2017). Economic Growth, Environment, FDI Inflows, and Financial Development in Middle East Countries: Fresh Evidence from Simultaneous Equation Models. J Knowl Econ.

Ali, M. H., Ali, R. A., & Farooq, A. (2021). The Effect of Tourism, Economic Growth and Environment in Developing Countries. iRASD Journal of Energy & Environment.

Bakhsh, K., Rose, S., Ali , M. F., & Ahmad, N. (2017). Economic growth, CO2 emissions, renewable waste and FDI relation in Pakistan: New evidences from 3SLS. Journal of Environmental Management.

Baltagi , B. H., & Liu, L. (2009). A note on the application of EC2SLS and EC3SLS estimators in panel data models. Statistics and Probability Letters.

Breunig, R., & Majeed, O. (2019). Inequality, poverty and economic growth. International Economics.

Gujarati, D. N. (2010). Basic Econometrics.

Haruna, M. A., & Mahmood, S. (2018). Impact of Energy Consumption and Environmental Pollution in Malaysia. Energy Economics Letters.

Hu, X., Ali, N., Malik, M., Hussain, J., Fengyi, J., & Nilofar, M. (2021). Impact of Economic Openness and Innovations on the Environment: a New Look into ASEAN Countries. Pol. J. Environ. Stud.

Khan, S., Peng, Z., & Li, Y. (2019). Energy consumption, environmental degradation, economic growth and financial development in globe: Dynamic simultaneous equations panel analysis. Energy Reports.

Malik, M. A. (2021). Economic growth, energy consumption, and environmental quality nexus in Turkey: Evidence from simultaneous equation models. Environmental Science and Pollution Research.

Mughal, N., Kashif, M., Arif, A., Guerrero, J. W., & Nabua, W. C. (2021). Dynamic effects of fiscal and monetary policy instruments on environmental pollution in ASEAN. Environmental Science and Pollution Research.

Nazeer, N. (2017). Overview of ASEAN Environment, Transboundary Haze Pollution Agreement and Public Helath. IJAPS.

Omri, A. (2013). CO2 Emissions, Energy Consumption and Economic Growth Nexus in MENA countries: Evidence from Simultaneous Equations Models . Energy Economics.

Radmehr, R., Henneberry, S. R., & Shayanmehr, S. (2021). Renewable Energy Consumption, CO2 Emissions, and Economic Growth Nexus: A Simultaneity Spatial Modeling Analysis of EU Countries. Structural Change and Economic Dynamics.

Ren, Y.-S., Apergis, N., Ma, C., Baltas, K., Jiang, Y., & Liu, J.-L. (2021). FDI, economic growth, and carbon emissions of the Chinese steel industry: new evidence from a 3SLS model. Environmental Science and Pollution Research.

Rizk, R., & Slimane, M. B. (2018). Modelling the relationship between poverty, environment, and institutions: a panel data study. Environmental Science and Pollution Research.

Rodriguez, J. G. (2018). Poverty and Economic Growth in Mexico. social sciences.

Rose, S., Ali, M. F., Bakhsh, B., Ashfaq, M., & Hassan, S. (2020). Linking environment, malaria, and agricultural returns: a labor time use analysis at different stages of production using 3SLS. Environmental Science and Pollution Research.

Saidi, K., & Hammami, S. (2014). The impact of energy consumption and CO2 emissions on economic growth: Fresh evidence from dynamic simultaneous-equations models . Sustainable Cities and Society.

Thanh, P. N., Phuong, N. D., & Ngoc, B. H. (2019). Economic Integration and Environmental Pollution Nexus in Asean: A PMG Approach. Approach.

MA6929m1_Manuscript Supriyanto.docx

ORIGINALITY REPORT

19%
SIMILARITY INDEX

PRIMARY SOURCES

1	link.springer.com Internet	277 words — 3%
2	docnum.univ-lorraine.fr Internet	72 words — 1%
3	"Beyond Traditional Probabilistic Methods in Economics", Springer Science and Business Media LLC, 2019 Crossref	61 words — 1%
4	www.researchgate.net Internet	61 words — 1%
5	Kais Saidi, Sami Hammami. "The impact of energy consumption and CO2 emissions on economic growth: Fresh evidence from dynamic simultaneous-equations models", Sustainable Cities and Society, 2015 Crossref	52 words — 1%
6	Dwi Endah Kusrini, Zakiatul Wildani, Nur Azizah. "ASEAN foreign trade analysis using dynamic panel data and simultaneous regression model", AIP Publishing, 2022 Crossref	45 words — 1%
7	econjournals.com Internet	40 words — < 1%

8	Omri, Anis, Saida Daly, Christophe Rault, and Anissa Chaibi. "Financial development, environmental quality, trade and economic growth: What causes what in MENA countries", Energy Economics, 2015. Crossref	29 words — < 1%
9	Faiqotul Mala, Rahma Fitriani, Nurjannah. "Estimation of Simultaneous System of Spatial Dynamic Equation Models with Spatially Corrected Blundell Bond Method of Moment (SCBB-GMM)", IOP Conference Series: Materials Science and Engineering, 2019 Crossref	28 words — < 1%
10	journals.mindamas.com Internet	27 words — < 1%
11	Kais Saidi, Sami Hammami. "Economic growth, energy consumption and carbone dioxide emissions: recent evidence from panel data analysis for 58 countries", Quality & Quantity, 2015 Crossref	26 words — < 1%
12	jp.feb.unsoed.ac.id Internet	26 words — < 1%
13	ejournal.radenintan.ac.id Internet	24 words — < 1%
14	E Sunandi, I M Sumertajaya, A Djuraidah, A H Wigena, A Fitrianto. "Dynamic Spatial Durbin Modeling (Case: Percentage of Poor Population in Indonesia 2010-2019)", Journal of Physics: Conference Series, 2021 Crossref	23 words — < 1%
15	Fithra Faisal Hastiadi. "Trade Strategy in East Asia", Springer Nature, 2016 Crossref	22 words — < 1%

16	envecon.econ.uth.gr Internet	22 words — < 1%
17	publishing-widyagama.ac.id Internet	21 words — < 1%
18	Sofien Tiba, Anis Omri, Mohamed Frikha. "The four-way linkages between renewable energy, environmental quality, trade and economic growth: a comparative analysis between high and middle-income countries", Energy Systems, 2015 Crossref	20 words — < 1%
19	dokumen.pub Internet	20 words — < 1%
20	etheses.whiterose.ac.uk Internet	20 words — < 1%
21	ijsab.com Internet	20 words — < 1%
22	ojs.ibbujournals.com.ng Internet	19 words — < 1%
23	saudijournals.com Internet	19 words — < 1%
24	www.iiste.org Internet	19 words — < 1%
25	www.ncbi.nlm.nih.gov Internet	18 words — < 1%
26	Gregor Dorfleitner, Christian Kreuzer, Christian Sparrer. "To sin in secret is no sin at all: On the linkage of policy, society, culture, and firm characteristics with	17 words — < 1%

corporate scandals", Journal of Economic Behavior & Organization, 2022
Crossref

27 cepr.org
Internet
16 words — < 1%

28 Abdouli, Mohamed, and Sami Hammami. "The Dynamic Links Between Environmental Quality, Foreign Direct Investment, and Economic Growth in the Middle Eastern and North African Countries (MENA Region)", Journal of the Knowledge Economy, 2016.
Crossref
15 words — < 1%

29 Journal of Economic Studies, Volume 40, Issue 5 (2013-10-26)
Publications
15 words — < 1%

30 jurnal.unmer.ac.id
Internet
14 words — < 1%

31 Mohamed Abdouli, Sami Hammami. "Economic Growth, Environment, FDI Inflows, and Financial Development in Middle East Countries: Fresh Evidence from Simultaneous Equation Models", Journal of the Knowledge Economy, 2018
Crossref
13 words — < 1%

32 Mounir Ben Mbarek, Kais Saidi, Mounira Amamri. "The relationship between pollutant emissions, renewable energy, nuclear energy and GDP: empirical evidence from 18 developed and developing countries", International Journal of Sustainable Energy, 2017
Crossref
12 words — < 1%

33 Sir Anderson, Annisa, Jon Affi, Yuli Yetri, Gunawarman. "The Effect of Aging Treatment on
12 words — < 1%

Mechanical Properties And Microstructures of Ti-12Cr In Ortodontic Applications", IOP Conference Series: Materials Science and Engineering, 2020
Crossref

34 statsmaths.github.io
Internet
12 words — < 1%

35 yeal.org
Internet
12 words — < 1%

36 Alireza Mohammadi, Armin Saeedikondori, Hossein Nezakati, Naghmeh Sabermajidi, Amer Hamzah Jantan. "chapter 16 An Investigation on Cloud Computing Adoption Within Information Technology Companies", IGI Global, 2021
Crossref
11 words — < 1%

37 Dinesh Jaisinghani. "Employees' compensation and profit persistence in emerging markets: empirical evidence from South Africa", African J. of Economic and Sustainable Development, 2017
Crossref
11 words — < 1%

38 Erik Biørn, Jayalakshmi Krishnakumar. "Chapter 10 Measurement Errors and Simultaneity", Springer Science and Business Media LLC, 2008
Crossref
11 words — < 1%

39 Jean Gaston Tamba, Francis Djanna Koffi, Michel Lissouck, Max Ndame, Ngwa Engelbert Afuoti. "A Trivariate Causality Test: A Case Study in Cameroon", Applied Mathematics, 2014
Crossref
11 words — < 1%

40 Neha Saini, Monica Sighania. "Environmental impact of economic growth, emission and FDI:
11 words — < 1%

systematic review of reviews", Qualitative Research in Financial Markets, 2019
Crossref

41 Teh-Wei Hu. "Effectiveness of child health and welfare programs: A simultaneous equations approach", Socio-Economic Planning Sciences, 1973 — 11 words — < 1%
Crossref

42 F. Pompei. "Evaluating innovation and labour market relationships: the case of Italy", Cambridge Journal of Economics, 10/27/2007 — 10 words — < 1%
Crossref

43 Hsien-Hung H. Yeh, Eduardo Roca. "Macroeconomic Conditions and Capital Structure over the Business Cycle: Further Evidence in the Context of Taiwan", Emerging Markets Finance and Trade, 2014 — 10 words — < 1%
Crossref

44 Pietro Balestra, Jayalakshmi Krishnakumar. "Chapter 2 Fixed Effects Models and Fixed Coefficients Models", Springer Science and Business Media LLC, 2008 — 10 words — < 1%
Crossref

45 Vannya Maheswari, Christy Atika Sari, De Rosal Ignatius Moses Setiadi, Eko Hari Rachmawanto. "Study Analysis of Human Face Recognition using Principal Component Analysis", 2020 International Seminar on Application for Technology of Information and Communication (iSemantic), 2020 — 10 words — < 1%
Crossref

46 archive.aessweb.com — 10 words — < 1%
Internet

47 hvtc.edu.vn

Internet

10 words — < 1%

48 i-rep.emu.edu.tr:8080
Internet

10 words — < 1%

49 www.asianonlinejournals.com
Internet

10 words — < 1%

50 www.ieomsociety.org
Internet

10 words — < 1%

51 www.isiarticles.com
Internet

10 words — < 1%

52 Aslan, Alper, Nicholas Apergis, and Mert Topcu. "Banking development and energy consumption: Evidence from a panel of Middle Eastern countries", Energy, 2014.
Crossref

9 words — < 1%

53 Brian Jason H. Ponce, Yolanda T. Garcia, Agham C. Cuevas, Gideon P. Carnaje. "Analyzing Pollution Emissions and Economic Growth in Asia Through the Lens of the Environmental Kuznets Curve", Research Square Platform LLC, 2022
Crossref Posted Content

9 words — < 1%

54 Iftikhar Yasin, Sana Naseem, Muhammad Awais Anwar, Ghulam Rasool Madni, Haider Mahmood, Muntasir Murshed. "An analysis of the environmental impacts of ethnic diversity, financial development, economic growth, urbanization, and energy consumption: fresh evidence from less-developed countries", Environmental Science and Pollution Research, 2022
Crossref

9 words — < 1%

55	James Temitope Dada, Folorunsho Monsur Ajide, Adams Adeiza. "Shadow Economy and Environmental Pollution in West African Countries: The Role of Institutions", Global Journal of Emerging Market Economies, 2021 Crossref	9 words — < 1%
56	aisel.aisnet.org Internet	9 words — < 1%
57	api.worldbank.org Internet	9 words — < 1%
58	journal.umy.ac.id Internet	9 words — < 1%
59	www.semanticscholar.org Internet	9 words — < 1%
60	"Global Approaches in Financial Economics, Banking, and Finance", Springer Science and Business Media LLC, 2018 Crossref	8 words — < 1%
61	Heli Arminen. "Simultaneous Equations Modeling in the Energy-Growth Nexus", Elsevier BV, 2018 Crossref	8 words — < 1%
62	Hop Thi Nguyen, Si Van Nguyen, Van-Huan Dau, Anh Tuan Huu Le, Khuong Vinh Nguyen, Dan Phuoc Nguyen, Xuan-Thanh Bui, Ha Manh Bui. "The nexus between greenhouse gases, economic growth, energy and trade openness in Vietnam", Environmental Technology & Innovation, 2022 Crossref	8 words — < 1%

63	J. D. Jobson. "Chapter 4 Multiple Linear Regression", Springer Science and Business Media LLC, 1991 Crossref	8 words — < 1%
64	Shoukat Iqbal KHATTAK, Manzoor AHMAD, Zahoor ul Haq, Gao SHAOFU, Jiang HANG. "On the goals of sustainable production and the conditions of environmental sustainability: Does cyclical innovation in green and sustainable technologies determine carbon dioxide emissions in G-7 economies", Sustainable Production and Consumption, 2021 Crossref	8 words — < 1%
65	Zhaoyin Liu, Yangyang Li, Andrea Law, Jia Yu Karen Tan, Weehan Chua, Yihan Zhu, Chen-Chieh Feng, Wei Luo. "Long-term Association between NO2 and Human Mobility: A Two-year Spatiotemporal Study during the COVID-19 Pandemic in Southeast Asia", Cold Spring Harbor Laboratory, 2022 Crossref Posted Content	8 words — < 1%
66	cscanada.net Internet	8 words — < 1%
67	journal2.um.ac.id Internet	8 words — < 1%
68	jurnal.pknstan.ac.id Internet	8 words — < 1%
69	pubmed.ncbi.nlm.nih.gov Internet	8 words — < 1%
70	pure.tue.nl Internet	8 words — < 1%
	revistasnicaragua.net.ni	

71	Internet	8 words — < 1%
72	studylib.net Internet	8 words — < 1%
73	www.cek.ef.uni-lj.si Internet	8 words — < 1%
74	www.citn.org Internet	8 words — < 1%
75	www.econ-environ-geol.org Internet	8 words — < 1%
76	www.iieta.org Internet	8 words — < 1%
77	www.indiablooms.com Internet	8 words — < 1%
78	www.scholink.org Internet	8 words — < 1%
79	Dorothy A. Amwata, Dickson M. Nyariki, Nashon R. K. Musimba. "Factors Influencing Pastoral and Agropastoral Household Vulnerability to Food Insecurity in the Drylands of Kenya: A Case Study of Kajiado and Makueni Counties", Journal of International Development, 2016 Crossref	7 words — < 1%
80	Kuan-Min Wang. "The relationship between carbon dioxide emissions and economic growth: quantile panel-type analysis", Quality & Quantity, 2011 Crossref	7 words — < 1%

81 Mohamed Abdouli, Sami Hammami. "Economic growth, FDI inflows and their impact on the environment: an empirical study for the MENA countries", Quality & Quantity, 2016 — 7 words — < 1%
Crossref

82 V Siagian, H Siregar, A Fariyanti, K Nainggolan, I Hidayah. "Impact of Increasing Input and Output Prices on Chili Production and Farmer Income in Banten Province", IOP Conference Series: Earth and Environmental Science, 2022 — 7 words — < 1%
Crossref

83 Anwar Khan, Yang Chenggang, Jamal Hussain, Sadia Bano, AAmir Nawaz. "Natural resources, tourism development, and energy-growth-CO2 emission nexus: A simultaneity modeling analysis of BRI countries", Resources Policy, 2020 — 6 words — < 1%
Crossref

EXCLUDE QUOTES ON
EXCLUDE SOURCES OFF
EXCLUDE BIBLIOGRAPHY ON
EXCLUDE MATCHES OFF

Economic growth and environmental degradation paradox in ASEAN: A simultaneous equation model with dynamic panel data approach

Supriyanto (Indonesia), Wiwiek Rabiatul Adawiyah (Indonesia), Arintoko (Indonesia), Dijan Rahajuni (Indonesia), Nunik Kadarwati (Indonesia)

Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko, Dijan Rahajuni, Nunik Kadarwati 2022
Supriyanto, Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia. (Corresponding author)
Wiwiek Rabiatul Adawiyah, Prof., Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Arintoko, Doctor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Dijan Rahajuni, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.
Nunik Kadarwati, Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia.

Abstract

Economic variables are dynamic in nature. This paper uses a simultaneous equation model to assess the complexity of the link between economic expansion and environmental deterioration in ASEAN. The study examines how CO_2 emissions, economic growth, public health initiatives, and control factors interact using dynamic panel data from 2011 to 2020. The population, the amount of forested land, the use of renewable energy, foreign investment, the inflation rate, the total amount of foreign exchange reserves, and government health policies are just a few examples. In order to provide a reliable and accurate assessment of the long-term relationship, this study employs the generalized approach of the Arellano-Bond moment method. The econometric technique deals with the issues of nonstationarity, endogeneity, cross-error correlation, and heteroscedasticity.

Additionally, the two stage least square (2SLS) method was used to assess the results' robustness. According to the statistical results, there is a causal link between CO_2 emissions and economic growth, and between CO_2 emissions and energy consumption. Furthermore, according to the data, ASEAN CO_2 emissions showed a monotonically growing relationship during the sample period. Policymakers may use these findings since they can aid in implementing economic measures to promote sustainable and ecologically friendly development.

Keywords: simultaneous equation model, CO_2 emissions, dynamic panel data, economic growth, energy consumption, ASEAN

JEL Classification: Q43, 044, C30, C33

Received on 27th of October, 2022

Accepted on 22th of November, 2022

Published on:

Introduction

Environmental damage has become a global issue and a common concern for people worldwide. Industrial growth has contributed to widespread environmental damage, especially in recent decades, and has affected the world's health, ecology, and climate balance (Radmehr et al., 2021). With the rapid expansion of industry, there has been exploitation and depletion of the earth's minerals and resources, as well as environmental degradation in the form of an increase in critical land, water pollution, and air pollution. The expansion of essential land has had unfavorable effects, such as flooding throughout the wet season and drought throughout the dry season. Ten ASEAN nations were compelled to reach a regional agreement on smog pollution that crosses international borders due to the severe effects of air pollution (Mughal et al., 2021) from smog and forest fires (Nazeer & Furuoka, 2017; Thanh et al., 2019). Energy use has both immediate and long-term effects on environmental quality in various ASEAN nations (Haruna & Mahmood, 2018).

Environmental degradation increased due to the significant increase in the economic growth of numerous ASEAN nations (Haruna & Mahmood, 2018; Hu et al., 2021; Mughal et al., 2021; Thanh et al., 2019). Due to this phenomenon, numerous studies have provided empirical evidence that economic growth will affect environmental quality changes during the early stages of development until a specific limit is reached. After this point, the condition will result in improved environmental conditions.

Using a yearly data set covering the years 1980–2014, Bakhsh et al. (2017) identified the factors that influence foreign direct investment (FDI) inflows into Pakistan as well as their direct effects on the environment's degradation and the growth of the economy. CO_2 emissions in the atmosphere are another factor that can be used to gauge the severity of air pollution. Rizk and Slimane (2018) analyzed the association between poverty and CO_2 emissions from 146 nations between 1996 and 2014 as a kind of environmental deterioration. The major finding is that poverty and CO_2 emissions have a nonlinear relationship that might cause poverty to increase and the environment to degrade. Therefore, the fundamental policy advice is that all nations should strengthen their institutional foundation to reduce poverty and environmental damage (Abdouli & Hammami, 2020).

In most nations worldwide, environmental deterioration is mainly caused by economic expansion and FDI (Bakhsh et al., 2017; Ren et al., 2021). Through technological transfer, higher productivity, and the introduction of new managerial techniques and procedures, the flow of foreign investment serves as a direct source of capital to promote economic growth. Additionally, FDI inflows aid in the financial development of the investing nation. This suggests that FDI increases the amount of money the financial system has access to. As a result, these funds support economic growth as well as the development of financial markets. It is also claimed that international businesses can use banking services to get loans, overdraft facilities, or to pay suppliers of semi-finished items. On the other hand, higher FDI inflows and economic expansion result in a reduction in the environment's quality.

It is impossible to ignore environmental degradation, including water and air pollution, which can jeopardize the viability of development. Engineering and compositional impacts show that more economic expansion results in higher pollution emissions (Bakhsh et al., 2017). The scale effect demonstrates that while pollution has a detrimental impact on growth, the stock of labor and capital benefits Pakistan's economy. Economic expansion and FDI have a favorable and considerable impact on capital stock in terms of the effect of capital accumulation. Even if economic expansion increases pollution, economic growth declines when pollution levels go beyond a certain point. As a result, solutions must be found to combat more severe air pollution. However, the majority of research is based on cross-sectional studies, and very few studies have used the panel data simultaneous equation technique (Ali et al., 2021; Bakhsh et al., 2017; Garza-Rodriguez, 2018; Haruna & Mahmood, 2018; Ren et al., 2021; Rizk & Slimane, 2018; Thanh et al., 2019). The model, which is still the subject of discussion, calls for a substitute model with new variables, specifically fiscal and monetary policies.

A simultaneous equation system has the characteristic that it consists of several equations (Baltagi & Liu, 2009). In addition to mathematical and phenomenal, there is a relationship between these equations (Rose et al., 2020). The model in this simultaneous equation system has endogenous and explanatory variables in each equation, unlike the single equation system. Explanatory variables in one equation may also be endogenous variables in another. As a result, these variables can be correlated with other explanatory variables. In this case, the estimation of ordinary least squares (OLS) cannot be used because OLS in a simultaneous equation system will produce biased and inconsistent parameter estimates (Gujarati, 2022). One alternative for estimation is the two-stage least square (2SLS) method. This method will produce one estimator for one parameter and a standard error for each estimator (Gujarati, 2022). Several previous studies have shown that it is possible to use a simultaneous equation model in environmental economics because the variables tend to have a

simultaneous relationship (Omri, 2013). Based on the phenomenon, there is a relationship between economic variables, so it cannot be modeled with a simple or multiple regression model. Thus, this study used the 2SLS method for factors that affect economic growth and environmental damage.

A simultaneous equation can also be used to model the correlation between economic upswing and poverty alleviation over the long and short term (Garza-Rodriguez, 2018). It was discovered through the vector error correction model (VECM) that poverty reduction and economic growth in Mexico are causally related in both directions. Ren et al. (2021) identified the crucial commitment to achieving China's sustainable development as the primary factor impacting the carbon emissions of China's steel sector. To determine the impact of malaria on working time during the agricultural production stage, Rose et al. (2020) used the three-stage least squares (3SLS) simultaneous equation model on cross-sectional data gathered from 252 agricultural employees.

This paper examines the interaction between CO_2 emissions, economic expansion, and national health policies in a panel of 10 ASEAN nations using simultaneous equation modeling on dynamic panel data. Unfortunately, there are still not many empirical studies that apply simultaneous equation modeling with growth rates in each ASEAN nation to investigate the link between CO_2 and GDP on fossil-based energy consumption, total foreign currency reserves, and renewable energy use. However, with the help of this model, it is possible to simultaneously analyze how government policies, CO_2 emissions, and economic growth are related (Saidi & Hammami, 2015). In particular, this paper makes use of a model with two structural equations that allow for the concurrent effects:

(i) The impact of CO_2 emissions, FDI, fossil fuel use, population, inflation rate, and overall reserves impact of foreign exchange on economic expansion is investigated.

(ii) The impact of population expansion, economic growth, government health policies, FDI, fossil fuel consumption, and renewable energy consumption on environmental pollution is investigated. In this paper, the growth rate is considered in the modeling approach to evaluate the short-run elasticity rather than the long-run.

1. Literature review and hypotheses

1.1. Theoretical literature review

A simultaneous equation model has multiple equations connected. As a result, a variable in a simultaneous equation can play the dual roles of both independent and dependent variables. This is possible in the simultaneous equation model. There are endogenous variables and predetermined variables in a simultaneous equation model. The predetermine variable is a variable whose value can be determined in advance but is not directly decided by the equation. In contrast, the endogenous variable is the dependent variable determined in the simultaneous equation system (non-stochastic).

Exogenous variables and endogenous lag variables are the two categories into which predetermined variables fall (Gujarati, 2022).

In the simultaneous equation model, there are two kinds of equations: structural and reduced form. The structural equation is the original equation that describes the behavior of the relationship between the existing variables. In contrast, the reduced equation is an equation with endogenous variables only influenced by the predetermined variable and the error component.

In panel data regression, the dependent variable is also affected by the dependent variable from the preceding period (lag 1), so the model is said to be a dynamic panel data model. The dynamic panel data regression model in economic research is more suitable for finding the relationship between economic variables. This dynamic panel data model can be seen from the lag of the dependent variable between the independent variables. The dynamic panel data model can be written as (Gujarati, 2022):

$$Y_{i.t} = \delta Y_{i.t-1} + \mathrm{X}'_{i,t}\,\beta + u_{i,t}, \quad i = 1, 2, \ldots, N, \quad t = 1, 2, \ldots, T, \qquad (1)$$

where N denotes the number of observations, T is the number of time periods, $Y_{i,t}$ response variable for individual i at time t, $Y_{i,t\text{-}1,}$ independent variable for individual i at time t (lag 1), $\mathrm{X}_{\mathrm{i,t}}$ is vector transpose of the independent variable for the i-th individual on t-th time measuring 1 x k, δ is the intercept coefficient which is a scalar, β is independent variable parameter vector of size k x 1, and $u_{i,t}$ is component error model for individual i at time t.

The problem in the dynamic panel data model is when $y_{i,t}$ is a function of $u_{i,t}$, then the result $y_{i,t\text{-}1}$ is also a function of $u_{i,t}$. As a result, the independent variable on the right side of $y_{i,t\text{-}1}$ correlated with each other $u_{i,t}$ if the solution uses the usual panel data estimation method, it will cause the results to be biased and inconsistent. To overcome this problem, two approach methods can provide unbiased and consistent results: GMM Arellano Bond and GMM Blundel Bond. First, however, it is necessary to use an instrumental variable method to facilitate the estimation of the GMM method.

Over the past 20 years, some theoretical studies have concentrated on the relationship between political activities, CO_2 emissions, FDI inflows, and economic development. The neo-classical growth model postulates that FDI inflows can boost the capital stock, quickening economic expansion. The new growth hypothesis then contends that both long- and short-term economic development are aided by the technological advancements brought forth by FDI inflows. However, because of liberalization, deregulation, and privatization policies, FDI slows down economic growth. Furthermore, financial development and economic growth can happen independently of one another. However, a higher rate of economic expansion has been attained at the expense of environmental deterioration.

The Environmental Kuznets Curve (EKC) is a tool for analyzing the relationship between government and environmental policies. This suggests that as financial development increases industrial activity to achieve profitable growth, environmental degradation increases during the primary stage. However, as financial development advances to the next stage, investments in environmental projects and access to cutting-edge technology are made to slow down environmental degradation. However, the environment was considered another production element in the traditional trade perspective on comparative advantage. However, this view contends that developing nations should adopt lax environmental standards to increase FDI inflows.

Furthermore, wealthy nations enforce strict environmental laws to reduce pollution output, which promotes FDI in developing nations or places with lax environmental laws. Additionally, the environment and FDI inflows are thought to be positively correlated, according to the Neo-Technology Trade Theory. This suggests that because of stringent environmental rules, FDI inflows utilize technology regarding the environment.

In the early 1980s, the theoretical links between governmental policy and economic growth (as measured by FDI and GDP proxies) were examined. To encourage investment in cutting-edge technology, a structure for financial development is necessary yet insufficient. Furthermore, according to some studies, FDI inflows and financial developments are tightly associated. This implies that FDI can help countries with more developed financial markets benefit more from economic growth promoting FDI.

1.2. Analyzing empirical literature and formulating hypotheses

Economic growth is proxied by the variables of GDP (Mughal et al., 2021), population (Rizk & Slimane, 2018), FDI (Ren et al., 2021), and fuel consumption (Ali et al., 2021; Garza-Rodriguez, 2018). Indicators of the success of a country's economy are reflected in the high GDP, the increased flow of investment into the country, stable inflation and interest rates, and ultimately the implications for creating new jobs. Under the pretext of accelerating the development process to catch up with developed countries, developing countries (Ali et al., 2021) carry out various maneuvers to achieve high economic growth without carrying out further studies of changes in the large-scale transformation of the economic system so fast (Rizk & Slimane, 2018).

The impact of economic growth on the deterioration of the natural environment has been the subject of many studies. For example, according to Bakhsh et al. (2017), who studied the impact of economic growth on carbon dioxide emissions, waste, and foreign investment in Pakistan, increased economic growth is likely to increase the amount of emissions that contribute to pollution.

The impact of pollution has a detrimental effect on the country's environmental quality. In contrast, the investment and labor of foreign nationals have a positive impact on the expansion of Pakistan's economy. This also occurred in several other countries that are still developing (Ali et al., 2021), such as Vietnam (Hu et al., 2021), Malaysia (Haruna & Mahmood, 2018), Nigeria, and Mexico (Garza-Rodriguez, 2018). Furthermore, for the ASEAN region (Thanh et al., 2019; Mughal et al., 2021), economic growth generally affects environmental pollution (Khan et al., 2019). Therefore, this study hypothesizes:

H1: There are contributions of CO_2 emissions, government policies in the health sector, FDI, consumption of fossil fuels, population, inflation rates, and total foreign exchange reserves to economic growth in ASEAN countries.

Over the past two decades, a number of empirical studies have examined the connection between FDI inflows, economic growth, the environment, and governmental policy. A similar quadratic association between income and CO_2 emissions is demonstrated by Thanh et al. (2019). This suggests that China has an inverted U curve. In line with that, Garza-Rodriguez (2018) tested the EKC hypothesis in Malaysia from 1980 to 2009 using the auto-regressive distributed lag (ARDL) methodology. Using the fixed-effect model and the generalized methods of moment (GMM) methodology, Haruna and Mahmood (2018) discovered a unidirectional relationship between GDP and carbon dioxide emissions.

In addition, it was found that Indonesia is one of the countries in which there is a link in the shape of an inverted U between the governmental policies and the amount of carbon emission (Nazeer & Furuoka, 2017). More specifically, they draw attention to the fact that as the financial sector matures, government initiatives initially result in a drop in CO_2 emissions. Hu et al. (2021) have discovered that Pakistan's CO_2 emissions that are reduced because of financial factors are significantly smaller than those that are increased due to rising per capita income. The hypothesis to be tested is:

H2: There is an influence of economic growth, government policies in the health sector, forest area, FDI, consumption of fossil-based energy, population, and consumption of renewable energy on environmental pollution.

In observing development, increasingly forgetting about natural preservation, further research is needed on the extent to which the use of the environment as natural capital is efficient (Hu et al., 2021). Moreover, it is vital to understand the consequences of environmental degradation and how the concept of environmental sustainability is associated with policies or regulations that apply to the environment appropriate to minimize environmental degradation in the context of sustainable development (Nazeer & Furuoka, 2017). Theoretical representations of the connection between

economic growth (Breunig & Majeed, 2020) and environmental degradation have been formulated by many previous researchers using regression models (Ali et al., 2021; Haruna & Mahmood, 2018) and panel data (Hu et al., 2021; Mughal et al., 2021; Nazeer & Furuoka, 2017; Rizk & Slimane, 2018; Rose et al., 2020) and 3SLS (Bakhsh et al., 2017). Thus,

H3: There is an interaction between increasing economic growth and concurrent environmental deterioration with support from government policy factors in the health sector, forest area, FDI, consumption of fossil-based energy, population, consumption of renewable energy, inflation rate, and total foreign exchange reserves.

Current research on ASEAN nations has produced a mixed bag of findings. As a result, it is challenging to offer the proper guidance and counsel to decision-makers as they develop each nation's foreign, environmental, economic, and financial policies. One possible explanation is that prior research should have considered the four-way interaction between each country's economic growth, FDI inflows, CO_2 emissions, and government policies. Therefore, the simultaneous equation model analyzes panel data from 10 ASEAN nations from 2011 to 2020.

2. Methodology

2.1. Econometric model

This study model uses a production function approach to explain the impact of CO_2 emissions, fossil fuel energy consumption (FFEC), total foreign exchange reserves (TR), inflation (INF), the government budget for health (DGGH), foreign investment (FDI), and population (POP) to economic growth (GDP) in the form of a function model:

$$GDP = f\left(CO2, FFEC, TR, Inf, DGGH, FDI, Pop\right). \quad (2)$$

Bakhsh et al. (2017), Haruna and Mahmood (2018), and Hu et al. (2021) included energy consumption, population growth, and CO_2 emissions as variables in their empirical models to examine how these two factors affected economic growth. While they generally discover that energy use and CO_2 emissions contribute to the explanation of economic expansion. A different study demonstrated that foreign investment had a statistically significant impact on economic growth (Ali et al., 2021; Bakhsh et al., 2017; Ren et al., 2021). In line with previous research, Mughal et al. (2021) showed that fiscal and monetary policies affect the country's economic growth. Thus, the model proposed in equation (2) is consistent with the wider literature on the determinants of economic growth cited above. Functional relationship between CO_2 emissions, GDP, governmental budget for health (DGGH), foreign investment (FDI), fossil fuel energy consumption (FFEC), population (POP, forest area (FA),

and use of renewable energy (REC) can be represented in equation (3) as follows (Haruna & Mahmood, 2018):

$$CO2 = f\left(GDP, DGGH, FDI, FFEC, Pop, FA, REC\right). \qquad (3)$$

In the case of economics, variables that have a two-way relationship are often encountered. This two-way relationship that influences each other can be summarized in a system of simultaneous equations. Almost all approaches in macroeconomics have a simultaneous nature. Identifying a simultaneous equation with the order conditions provides information that an equation is exactly identified or overidentified. Based on the order conditions, the model is said to be identified if the equations (2) and (3) meet the requirements if the model shows $K - k \geq m - 1$, then called over-identified. If $K - k = m - 1$, then it is called precisely identified, and if $K - k < m - 1$, then the equation is unidentified.

Due to the correlation between endogenous variables and disturbances in simultaneous equations, the OLS estimator will result in a biased and unstable estimate. Therefore, an alternative estimation method is needed, which is called the 2SLS method. The 2SLS method is the application of OLS in two stages. First, a simultaneous test (Hausman test) is needed to test whether explanatory endogenous variables correlate with disturbance. In data processing using panel data, there are several stages of testing that aim to determine the best model to be used in a panel data study (Gujarati, 2010). The three models in panel data regression processing are the common effect model, the fixed effect model, and the random effect model. In addition, there are three stages of testing the model selection on the panel data: the Chow test, the Hausman test, and the LM test. The Chow test is useful for testing the model selection between the common effect model and the fixed effect model. The Hausman test is used to test the model selection between the fixed effect model and the random effect model. At the same time, the LM test is used to test the model selection between the random effect model and the common effect model. After knowing the best model to be used in the study, hypothesis testing, such as the coefficient of determination and partial and simultaneous significance tests, will be carried out.

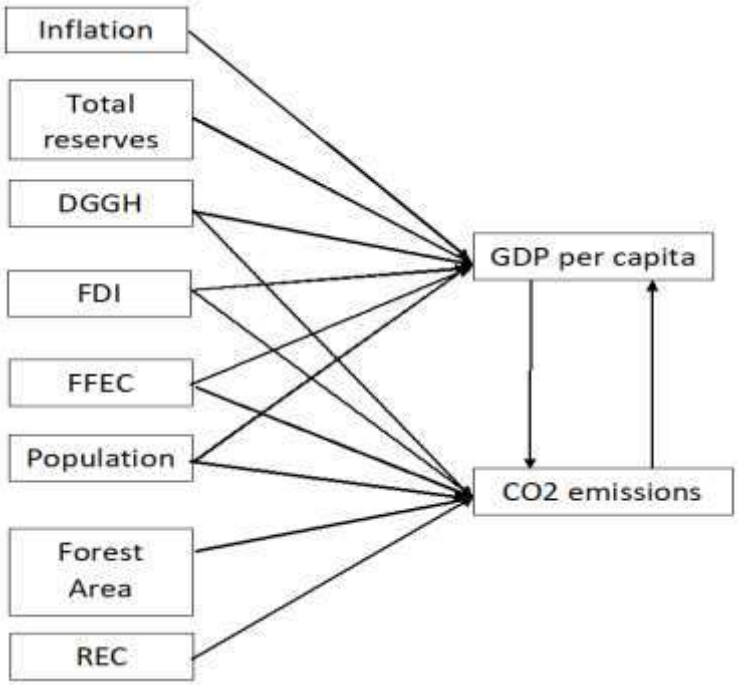

Figure 1. Simultaneous relationship model between variables

Two basic specifications of the panel data simultaneous equation model are as follows (Figure 1).

The panel data simultaneous equation model for economic growth is:

$$GDP_{it} = \alpha_0 + \alpha_1 CO2_{it} + \alpha_2 Inf_{it} + \alpha_3 TR_{it} + \alpha_4 DGGH_{it} + \alpha_5 FDI_{it} + \alpha_6 FFEC_{it} + \alpha_7 Pop_{it} + \varepsilon_{1it}. \quad (4)$$

The simultaneous equation model of panel data for air pollution is:

$$CO2_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 DGGH_{it} + \beta_3 FDI_{it} + \beta_4 FFEC_{it} + \beta_5 Pop_{it} + \beta_6 FA_{it} + \beta_7 REC_{it} + \varepsilon_{2it}. \quad (5)$$

The classical assumption test will be carried out in three stages, namely the classical assumption test of heteroscedasticity, autocorrelation, and multicollinearity. These three stages must be met so that the data used is tested for validity. Heteroscedasticity resulted in unbiased coefficient values, but the variance of the estimated regression coefficients was no longer minimal. The Harvey test can test the existence of heteroscedasticity. To prove the presence of heteroscedasticity with the white test, it can be done by comparing the value of n (amount of data) and R-square of the unadjusted R-square value in the auxiliary model. Autocorrelation shows the regression residual that is not independent from one observation to another. Autocorrelation can arise from an inappropriate specification of the relationship between endogenous variables and explanatory variables. The presence of autocorrelation can be detected through the Durbin-Watson Test. Multicollinearity arises when the independent variables are correlated with each other. Multicollinearity is the relationship between independent variables, which is a condition of a strong correlation between independent

variables or vice versa. The existence of multicollinearity can be determined through a correlation matrix or regression between independent variables in the equation model.

2.2. Data

The data used are annual data for GDP per capita (constant 2015 USD), CO_2 gas emissions (metric tons per capita), inflation, total reserves (including gold, current USD), fossil fuel energy consumption (% of total), renewable energy consumption (% of total final energy consumption), population (total), foreign direct investment, net inflows (BoP, current USD), forest area (sq. km), and domestic general government health expenditure (% of general government expenditure). The data were collected for 2011–2020, sourced from the World Bank's World Development Indicators. To estimate the model, the paper divided the variable by the population to get the variable in per capita terms. The study covered 10 ASEAN countries that were selected based on data availability. These countries are Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Laos, Philippines, Singapore, Vietnam, and Thailand. Descriptive statistics of various variables for individuals and panels are presented in Table 1.

Table 1. Description of research variable data per ASEAN countries

Country	Descriptive statistics	CO2 emissions	GDP per capita	Inflation	Total reserves	Fossil fuel energy consumption	Renewable energy consumption	Population	Foreign direct investment	Forest area	Domestic general government health
Brunei	Avg	16.91835346	31,539.51106	–1.007741886	35,27,561,554	99.99854192	0.00441	416,580.1	515,039,321.8	3,800	6.016399526
	Std. dev	1.44032045	1,659.323029	10.76447439	438,897,667.4	0.002340927	0.005962	14,804.90325	235,866,554.6	0	0.703611169
	Maximum	19.35389761	34,244.2069	20.18050542	4,272,696,958	100	0.0149	437,483	864,905,527.5	3,800	7.13899708
	Minimum	14.41262527	29,802.78288	–17.61280313	2,583,674,788	99.99437899	0	393,687	150,550,827.3	3,800	5.12074184
Cambodia	Avg	0.478608348	1,194.607567	2.230207326	10,352,256,400	29.14059296	66.41803017	15,637,515.7	2,503,604,406	89,617.67	6.603743457
	Std. dev	0.150636891	172.9710883	1.434629544	6,138,256,293	2.498229959	3.426905774	735,975.8954	778,699,496.1	7,336.536185	0.445018657
	Maximum	0.710207176	1,441.179228	3.475254586	21,328,475,093	32.96813121	71.32559967	16,718,971	3,663,032,999	102,407.48	7.16890764
	Minimum	0.335613209	940.1118195	–0.865696886	4,061,785,157	24.43280442	61.46900177	14,541,421	1,538,883,425	80,683.7	5.70839548
Indonesia	Avg	1.900583372	3,389.71266	3.730182313	1.17246E+11	65.14695824	29.17991962	259,691,144.1	19,802,486,640	951,839.9	6.634999848
	Std. dev	0.148729516	350.9983597	2.174092191	11633834111	0.886518696	4.794287411	9,580,810.416	5,816,882,734	21,901.56537	2.028809953
	Maximum	2.178461553	3,877.382977	7.465943034	1.35916E+11	67.15478782	38.1792984	273,523,621	25,120,732,060	987,329.4	8.67722607
	Minimum	1.653210477	2,849.354985	–0.456130066	99,386,826,239	63.80707707	20.86389923	245,115,988	4,541,713,739	921,332	3.96187973
Laos	Std. dev	1.197511798	2,180.408249	4.637573877	1,131,583,292	90.49812731	56.52980042	6,801,970.5	925,492,889.5	167,507.5	3.392989075
	Std. dev	0.95346821	320.375924	2.920573489	140,781,847.4	5.227415579	8.454153332	313,339.7572	391,317,753.9	1,044.539372	1.074015763
	Maximum	2.662148349	2,579.253661	10.4687176	1,392,600,619	94.63801786	66.45030212	7,275,556	1,693,080,811	169,060	4.70540714
	Minimum	0.413100759	1,687.147369	1.852096761	916,030,473.8	84.14968302	41.88410187	6,347,564	300,743,507.1	165,955	1.76665986
Malaysia	Avg	7.273359125	10,026.20971	5.103978795	1.12905E+11	96.73070066	3.30539999	30,495,877.2	10,039,906,258	192,359.66	7.841254377
	Std Dev	0.383396334	959.6792015	3.150672322	17,133,611,020	0.200188553	1.255560672	1,248,377.241	2,941,420,592	1,231.822903	0.875816525
	Maximum	7.757158614	11,414.5787	8.677799133	1.39731E+11	96.94482833	5.310500145	32,365,998	15,119,439,204	194,642.2	8.76370335
	Minimum	6.526762285	8,550.154638	–2.651352414	94,481,267,074	96.21646697	1.95539999	28,650,962	4,313,013,745	190,509.64	6.51518917
Myanmar	Avg	0.326829819	1,272.100612	1.563082258	6,189,934,531	27.26229528	74.31700974	52,780,957.3	2,578,749,364	298,475.87	3.352140916
	Std. dev	0.166864829	219.8750129	1.870692999	1,503,800,868	4.02800422	9.381750194	1,142,156.287	1,127,972,162	8,771.43153	0.978610652
	Maximum	0.605492803	1,586.90232	5.41240809	8,835,555,373	31.70408856	85.58110046	54,409,794	4804272487	311,512.88	4.97641993
	Minimum	0.15183969	962.9954522	–0.77780922	4,509,489,139	20.8796747	60.11109924	50,990,612	1,333,856,137	285,438.9	1.64683187
Philippines	Avg	1.049645955	3,064.511787	1.998413176	84,314,479,934	58.2433612	26.96183014	102,746,642.3	6,408,021,984	70,315.96	7.234985352
	Std. dev	0.180425659	389.9833881	1.401186097	9,750,849,968	1.852358853	2.757161472	4,714,706.933	2,862,276,671	1,056.257297	0.770412409
	Maximum	1.33369096	3,664.79067	3.918805776	1.0999E+11	61.41213905	31.22660065	109,581,085	10,256,442,399	71,885.9	8.19224167
	Minimum	0.838832482	2,484.489204	–0.71968279	75,123,089,217	56.18237608	23.2201004	95,570,049	2,007,150,725	68,746.06	6.07696486
Singapore	Avg	3.672530757	56,228.09953	0.732192976	2.78505E+11	97.52192547	0.582879996	5,514,760.1	76,702,277,498	164.5405	13.86876393
	Std. dev	0.179703423	3,705.552157	1.977278357	36,126,714,156	1.388649317	0.098034083	171,487.1629	21,619,951,957	6.429658385	0.936438621
	Maximum	3.851520326	61,173.90477	3.347638991	3.69834E+11	98.71373917	0.727299988	5,703,569	1.20439E+11	174.866	15.33037758
	Minimum	3.309563004	50,685.2962	–2.91966152	2.43798E+11	94.00615626	0.47330001	5,183,688	49,155,657,316	155.7	11.97459507

Thailand	Avg	8.256578092	5,946.451584	1.544289408	1.89964E+11	80.83046839	22.95395012	68,768,727.7	7,980,512,101	200,054	14.28420448
	Std. dev	0.228147614	450.4341067	1.256683626	32,617,529,928	0.763163079	0.590424479	774,839.5156	4,656,322,353	741.6138558	0.429262561
	Maximum	8.636708073	6,617.542822	3.74309812	2.58104E+11	82.05719879	24.12770081	69,799,978	15,935,960,665	200,706	15.06272507
	Minimum	7.785349708	5,182.042369	–1.066259571	1.5646E+11	79.99305669	22.26580048	67,518,379	2,473,685,996	198,730	13.73816299
Vietnam	Avg	1.975363601	2,170.813333	5.209557239	44166944747	64.92374886	33.83905964	93,140,456.3	11,981,800,000	141,456.34	9.3609869
	Std. dev	0.408992745	329.9848058	6.415768699	25,636,306,572	4.215425552	4.602318905	2,870,322.867	3,333,290,193	4,050.993674	0.848983178
	Maximum	2.698805922	2,655.767774	21.26065929	94,833,616,150	70.32817751	38.10189819	97,338,583	16,120,000,000	146,430.9	10.21770763
	Minimum	1.512419303	1,733.311285	–0.190788132	13,539,119,001	58.26328476	23.49180031	88,871,384	7,430,000,000	135,228.2	7.89614296

Table 1. Description of research variable data per ASEAN countries

Table 1 (continuation). Description of research variable data per ASEAN countries

On average, the highest CO_2 emissions per capita (16,918) and fossil fuel energy consumption (99.998%) occurred in Brunei Darussalam. In contrast, GDP per capita (56,228.10), total foreign exchange reserves (278,505,095,437.544), and FDI (76,702,277,498.4464) were highest in Singapore. The highest average inflation occurred in Vietnam (5.21%), the largest population (259,691,144) and forest area (951,839.9) in Indonesia, the users of renewable energy in Myanmar (74,317), and the highest government budget for health in Thailand (14.284%). In contrast, the lowest average for CO_2 emissions (0.3268), fossil fuel consumption (27.262%), and health budget (3.352%) occurred in Myanmar. The highest/lowest? GDP (1,194.608) occurred in Cambodia, inflation (–1.008%), energy consumption (), renewable resources (0.0044%), total population (416,580), and FDI (515,039,321.7593) occurred in Brunei Darussalam, the country's total foreign exchange reserves (1,131,583,292.036) were in Laos, and forest area (164.5405) was in Singapore.

3. Results

3.1. Model identification

Before estimating the parameters, it is necessary to identify the problem first to see if the equation model formed can be used using the two-stage least square approach. In identifying these problems, the paper uses order condition tests. The test results with order conditions are described in Table 2.

Table 2. Problem identification with order conditions

Equation model	*K*	*k*	*M*	*m*
Economic growth	8	6	2	1
Environmental degradation	8	6	2	1

Based on the results in Table 2, equation (4) and equation (5) models are over-identified equations, which means that the two models are correctly identified so that the two-stage least square approach can be used.

3.2. Panel unit root test

The panel unit root test must first be run to determine if the pertinent variables in a panel data analysis are stationary. Levin et al. (2002) used the LLC approach for the panel unit root test. In the two-unit root tests mentioned above, the null hypothesis is that there is a unit root (i.e., the variable is not stationary), and the alternative hypothesis is that the series has no unit root (that is, the variable is stationary). Table 3 displays the outcomes of the panel unit root test for the variable level. All variables at the level can be demonstrated to be statistically significant in the LLC test, proving that they are all integrated and stationary.

Table 3. Panel unit root test results for research variables

Variable	LLC		orde
	t-test	p-value	difference
GDP	–2.85314	0.0022	0
CO2	–4.84032	0.0000	1
Inflation	–3.53321	0.0002	1
Total reserves	–7.67206	0.0000	1
Fossil fuel energy consumption	–2.33517	0.0098	1
Renewable energy consumption	–3.3085	0.0005	1
Population	–17.8459	0.0000	0
Foreign direct investment	–4.90609	0.0000	1
Forest area	–1.69936	0.0446	0
Domestic general government health expenditure	–4.56086	0.0000	0

3.3. Hausman test

Hausman test aims to prove the existence of a simultaneous relationship between the two independent equations (Gujarati, 2022). The hypothesis for the Hausman specification test is H0, which means a simultaneous relationship between the GDP equation and CO_2 emissions, and H1, which means that there is no simultaneous relationship between the GDP equation and CO_2 emissions. The test statistic used is the t-test with the rejection area; if the p-value of the residual variable is less than 0.05, then H0 is rejected. Hausman test results are shown in Table 4.

Table 4. Hausman specification test results

Dependent variables	Residual variables	p-value
GDP	resCO2	0.7687
CO2	resGDP	0.7697

Table 4 shows that the p-value for the resCO2 and resGDP variables is greater than 0.05, so H0 fails to be rejected. Thus, it can be concluded that the GDP equation has a simultaneous relationship with the CO2 equation.

3.4. Model estimation using the generalized method of Arellano-Bond moment

The equation estimation uses the GMM estimation that consists of equations (4) and (5). Based on the calculation results, the panel data simultaneous equation models for the GDP and CO_2 equations are obtained, as shown in Tables 5 and 6.

Table 5. Estimation results of the regression coefficient with the dependent variable log(GDP)

Variables	Coefficient	Std. error	t-statistic	Prob.
log(GDP)(–1)	1.061778	0.309590	3.429633	0.0009
CO2	0.016286	0.005945	2.739297	0.0074
DGGH	–0.017750	0.005837	–3.041210	0.0031
log(FDI)	0.218758	0.051567	4.242200	0.0001
FFEC	0.005423	0.000736	7.367219	0.0000

log(POP)	–0.516775	0.034506	–14.97636	0.0000
Inflation	–0.006128	0.002878	–2.129145	0.0359
log(TR)	0.383726	0.051116	7.506975	0.0000

Table 6. Estimation results of the regression coefficient with the dependent variable CO_2 emissions

Variables	Coefficient	Std. error	t-statistic	Prob.
CO2(–1)	30.60480	12.84430	2.382753	0.0192
log(GDP)	5.535230	2.686844	2.060124	0.0422
DGGH	0.418852	0.059462	7.043982	0.0000
log(FA)	4.064589	0.475518	8.547710	0.0000
log(FDI)	–2.509603	0.622581	–4.030966	0.0001
FFEC	0.078115	0.012013	6.502819	0.0000
Log(POP)	4.846382	0.832686	5.820179	0.0000
REC	–0.121500	0.031691	–3.833878	0.0002

3.4.1. Test the significance of the parameters simultaneously

If there is a relationship between the variables in an equation model, it will be found via parameter significance testing. The parameter significance test also examines whether the independent variable impacts the dependent variable. Table 7 shows the results of the simultaneous parameter significance test.

Table 7. Simultaneous significance test results

Equation model	F-statistic	Chi-square	p-value
Log (GDP)	13311.64	5324.658	0.0000
CO2	4038.371	1615.348	0.0000

Based on Table 7, it can be seen that the p-value of the two equations, namely GDP and CO_2, are less than 0.05, thus making the independent variables of the two models have a significant effect on the dependent variable (H0 is rejected).

3.4.2. Significance of the parameters partially

The paper performs the partial parameter significance test to determine whether the independent variable only has a partial impact on the dependent variable. Tables 5 and 6 show that all independent variables have p-values that are less than 0.05, so it is concluded that all independent variables have a significant effect on the equation (3) and (4) models.

3.5. Classic assumption test and normality test

The assumptions used in this study are the normality test, Arellano-Bond (AB) test, and Sargan test. The objective of the normality test in a regression analysis is to establish whether the model's independent and dependent variables have a normal distribution. The Jarque-Bera test is a statistical method that can determine whether the model is normally distributed (Gujarati, 2022). From Table 8, information is obtained that the residuals of the two models are normally distributed.

Table 8. Simultaneous significance test results

Equation model	Jarque-Bera statistic	p-value
Log(GDP)	0.790035	0.673668
CO2	1.841905	0.093268

3.5.1. Arellano-Bond (AB) test

The Arellano-Bond test aims to test the consistency of the model. In the Arellano-Bond test, there are two tests with different functions, namely the ab(1) test, which serves to determine the influence of individual effects between observations, and the ab(2) test, which functions to determine whether or not there is a correlation between the first difference error in the i-th observation (Gujarati, 2022).

Table 9. Arellano-Bond test's result

Dependent variable	Test order	m-statistic	rho	SE(rho)	p-value
Log(GDP)	AR(1)	–5.971336	–0.049369	0.008268	0.0000
	AR(2)	–0.287108	–0.002059	0.007171	0.7740
CO2	AR(1)	–6.039716	–0.001869	0.000309	0.0000
	AR(2)	–0.105762	–0.000032	0.00030	0.9158

Based on Table 9, the p-value for ab(1) both models is 0.000, so the decision rejects H0, and it can be concluded that the GDP and CO_2 equation model does not have individual effects between variables. For the ab(2) test results, the P-values obtained are 0.774 and 0.9158, so H0 is not rejected. Thus, it is concluded that there is no lag effect of the dependent variable on the first difference error in the GDP and CO_2 models. Therefore, because the ab(1) and ab(2) tests are met, it can be concluded that the GDP and CO_2 equation models are consistent.

3.5.2. Sargan test

The Sargan test is used to evaluate the validity of using instrument variables that are more numerous than the estimated parameters (over-identified) (Gujarati, 2022). Table 10 shows the results of the Sargan test of the two-equation models.

Table 10. Sargan test results

Equation model	Prob (J-statistic)
Log(GDP)	0.2901
CO2	0.2927

Based on Table 10, the results show that both models have a p-value of more than 0.05. The GDP equation model has a p-value of 0.2901. In contrast, the CO_2 equation model has a p-value of 0.2927, so the decision is to fail to reject H0. It can be concluded that the two models have no problem with the validity of the instrument variables.

Hypotheses (*H1*, *H2*, *H3*) testing results?

4. Discussion

Based on Table 5, it is shown that the coefficient of lag indicator of economic growth (GDPt-1) has a positive and statistically significant effect. Thus, every country in the ASEAN region can take appropriate macroeconomic policies with a backward look at achieving high and sustainable economic growth. For the panel results, FDI inflows per capita have a positive and significant effect on GDP per capita. Every 1% increase in FDI will increase GDP 0.219 times at the time of ceteris paribus. This shows that economic growth is elastic to FDI inflows. This implies that the technological changes brought about by FDI inflows promote economic development in the long run. This indicates that the influence of foreign investment has not been able to encourage economic growth for all countries in the ASEAN region. Although FDI is still only focused on a few countries, it positively affects economic growth in the ASEAN region. These results are in line with Bakhsh et al. (2017), Hu et al. (2021), and Ren et al. (2021). Therefore, each country can take appropriate macroeconomic policies by looking backward to obtain high and sustainable economic growth.

It demonstrates an indirect relationship between CO_2 emissions and energy consumption, as well as between energy consumption and economic growth, using the example of Malaysia. Meanwhile, Singapore shows that economic growth and energy consumption show no relationship to CO_2 emissions, but openness and industrialization have causality in CO_2 emissions. This proves that Singapore can maintain economic growth without causing environmental damage. The Environmental Kuznets Curve in Malaysia shows that it has yet to pass a turning point. However, Singapore has passed a critical point and is already in a state of environmental improvement while continuing economic development (Thanh et al., 2019). From a study in Pakistan, CO_2 emissions will increase as economic growth increases. The reason behind this relationship between economic growth and CO_2 emissions is based on the fact that large amounts of energy that are intensive in carbon are utilized to carry out economic activities in a variety of different fields (Bakhsh et al., 2017; Malik, 2021).

Another variable that affects the indicators of economic growth is the inflation indicator. An increase in the inflation indicator by one percent will be responded to by a decrease in economic growth by 0.006128 percent at the time of ceteris paribus. This result is in accordance with Ren et al. (2021), showing that inflation drives economic growth. The long-run multiplier on the inflation rate variable on economic growth indicators is much larger than the short-run multiplier. The phenomenon of inflation in developing countries such as Indonesia is still a threat to economic stability. The tendency of rising prices generally reflects the level of inflation that occurs in a country. The consumer price index is an indicator used to describe price movement. Changes in public consumption patterns in the long term trigger an increase in aggregate demand to encourage an increase in the inflation rate.

In the long term, an increase in a country's economic growth reflects people's income and consumption. Business actors followed up the increase in demand by increasing their production output. With the addition of output, the costs incurred for the production process become greater, causing an increase in the selling price of the product. If, for a relatively long time, most of the traders do the same thing, then the increase in the prices of consumer goods, in general, can encourage an increase in inflation.

The role of government spending in the health sector has a positive effect on boosting economic growth. Government spending on health has a positive effect on attracting foreign investment. This will indirectly increase economic growth so that welfare will increase. Considering the benefits for investors in addition to quality labor, the region will become a significant consumer due to the increasing welfare. An increase in government spending (DGGH) by one percent causes an increase in the economic growth of 0.01775 percent at the time of ceteris paribus. In the long term, an increase in government spending can increase foreign investment by 1.203 percent. Nazeer and Furuoka (2017) also showed that government spending has a positive and statistically significant effect on increasing economic growth, concluding that simultaneously government spending has a positive effect on investment development in the ASEAN region.

The empirical findings for the global panel are shown in Table 6, demonstrating that energy consumption significantly reduces CO_2 emission levels at the 1% level. This implies that increased energy use may result in increased CO_2 emissions. Economic growth is significantly and favorably influenced by panel estimates. A robust energy policy is required to promote sustained economic growth because energy is a critical component. These findings concur with those of Thanh et al. (2019). In terms of the pollutant variable, it was discovered that CO_2 emissions have a sizable impact on worldwide panel economic growth. This demonstrates that a 1% increase in CO_2 emissions causes a 0.005423% rise in economic growth.

For almost all nations, population increase is statistically significant and negatively influences economic growth at a 1% level. Population growth raises the level of government policies, including health, fuel, and other subsidies. Additionally, fuel consumption has a 1% favorable impact on CO_2 emissions. If there is a population of 1%, in the short term, it will cause a slowdown in the economic growth of 0.516775%. On the other hand, an increase in population by 1% will increase CO_2 emissions by 4.846382%.

Conclusion and implication **Conclusion can be shortened!**

In order to investigate the connection between expanding economies and rising levels of carbon dioxide emissions, this study focused on applying GMM estimates for the years 2011 to 2020

to data gathered from 10 ASEAN nations. The primary findings point to a two-way causal connection between rising CO_2 levels and a wider range of economic activity. Both the growth of the economy and the amount of carbon dioxide emissions are consistent with the hypothesis. The existence of a unidirectional causal relationship between economic growth and CO_2 emissions is further validated by the empirical findings uncovered.

The primary theoretical and policy ramifications can be summarized as follows. First, the feedback between FDI inflows and economic growth indicates a causal relationship. The ongoing increase in FDI inflows can help the economy by fostering growth through knowledge transfer, ripple effects, greater productivity, and introducing new processes. Therefore, by fostering an environment that encourages FDI inflows, FDI can be enhanced at the expense of economic growth. As a result, these nations must think about more responsible policies that may include lowering obstacles that prevent local businesses from forging meaningful connections, expanding their access to inputs, technology, and financing, and streamlining the processes involved in purchasing inputs. These findings support both the new growth theory and the neo-classical growth theory. These theories specifically show that FDI inflows can enhance capital stock, which in turn improves economic growth. They also find that FDI inflows can bring about technological breakthroughs that can promote economic development in the long and near term.

Second, the feedback theory between economic growth and CO_2 emissions contends that the two phenomena are commonly impacted and determined simultaneously. According to the global panel, countries must establish environmental regulatory laws to regulate carbon emissions because there is a positive causal relationship between CO_2 emissions and economic growth. Additionally, there is a direct causal link between growth and CO_2 emissions. According to the worldwide panel, this suggests that more incredible economic growth causes environmental deterioration. By promoting coordinated knowledge and technology transfer of environmentally beneficial technologies with foreign enterprises, policymakers are drawn to tight environmental restrictions to attract foreign direct investment and prevent pollution. This outcome is consistent with the theory of comparative advantage's classical trade perspective and considers the environment as a further factor of production. However, this view contends that in order to increase FDI inflows, developing nations should adopt lax environmental standards.

Third, economic growth and CO_2 emissions are causally linked in ASEAN countries in a two-way fashion. This suggests that the worsening of the environment is due to economic growth. High economic growth currently contributes to environmental degradation, and declining economic growth creates unemployment, which can significantly strain the economies of ASEAN member states. In

order to increase their efforts to combat global warming, governments should cut CO_2 emissions without compromising either short- or long-term growth. In reality, it will promote environmentally friendly, sustainable economic growth.

On the other hand, pollutant emissions negatively impact economic growth, suggesting that environmental degradation is a causal factor in economic growth. Furthermore, continued environmental degradation can have a negative externality on the economy due to its effects on human health and can eventually lower productivity. This is consistent with the Environmental Kuznets Curve theory, which states that environmental degradation causes a downward slope in economic growth.

Author contributions

Conceptualization: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko.

Data curation: Supriyanto.

Formal analysis: Supriyanto.

Investigation: Arintoko, Nunik Kadarwati.

Methodology: Supriyanto, Wiwiek Rabiatul Adawiyah, Arintoko.

Project administration: Wiwiek Rabiatul Adawiyah, Dijan Rahajuni.

Resources: Nunik Kadarwati.

Software: Supriyanto.

Supervision: Dijan Rahajuni, Nunik Kadarwati.

Validation: Dijan Rahajuni, Nunik Kadarwati.

Visualization: Dijan Rahajuni.

Writing – original draft: Supriyanto.

Writing – review & editing: Wiwiek Rabiatul Adawiyah, Arintoko.

References

1. Abdouli, M., & Hammami, S. (2020). Economic Growth, Environment, FDI Inflows, and Financial Development in Middle East Countries: Fresh Evidence from Simultaneous Equation Models. *Journal of the Knowledge Economy, 11*(2), 479-511. https://doi.org/10.1007/s13132-018-0546-9
2. Ali, M. H., Ali, R. A., & Farooq, A. (2021). The Effect of Tourism, Economic Growth and Environment in Developing Countries. *IRASD Journal of Energy & Environment, 2*(1), 24-33. https://doi.org/10.52131/jee.2021.0201.0013
3. Bakhsh, K., Rose, S., Ali, M. F., Ahmad, N., & Shahbaz, M. (2017). Economic growth, CO2 emissions, renewable waste and FDI relation in Pakistan: New evidences from 3SLS.

Journal of Environmental Management, 196, 627-632. https://doi.org/10.1016/j.jenvman.2017.03.029

4. Baltagi, B. H., & Liu, L. (2009). A note on the application of EC2SLS and EC3SLS estimators in panel data models. *Statistics & Probability Letters, 79*(20), 2189-2192. https://doi.org/10.1016/j.spl.2009.07.014
5. Breunig, R., & Majeed, O. (2020). Inequality, poverty and economic growth. *International Economics, 161*, 83-99. https://doi.org/10.1016/j.inteco.2019.11.005
6. Garza-Rodriguez, J. (2018). Poverty and Economic Growth in Mexico. *Social Sciences, 7*(10), 183. https://doi.org/10.3390/socsci7100183
7. Gujarati, D. M. (2022). *Basic Econometrics*. McGraw-Hill.
8. Haruna, M. A., & Mahmood, S. (2018). Impact of Energy Consumption and Environmental Pollution in Malaysia. *Energy Economics Letters, 5*(1), 31-43. https://doi.org/10.18488/journal.82.2018.51.31.43
9. Hu, X., Ali, N., Malik, M., Hussain, J., Fengyi, J., & Nilofar, M. (2021). Impact of economic openness and innovations on the environment: A new look into ASEAN countries. *Polish Journal of Environmental Studies, 30*(4), 3601-3613. https://doi.org/10.15244/pjoes/130898
10. Khan, S., Peng, Z., & Li, Y. (2019). Energy consumption, environmental degradation, economic growth and financial development in globe: Dynamic simultaneous equations panel analysis. *Energy Reports, 5*, 1089-1102. https://doi.org/10.1016/j.egyr.2019.08.004
11. Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics, 108*(1), 1-24. https://doi.org/10.1016/S0304-4076(01)00098-7
12. Malik, M. A. (2021). Economic growth, energy consumption, and environmental quality nexus in Turkey: Evidence from simultaneous equation models. *Environmental Science and Pollution Research, 28*(31), 41988-41999. https://doi.org/10.1007/s11356-021-13468-7
13. Mughal, N., Kashif, M., Arif, A., Guerrero, J. W. G., Nabua, W. C., & Niedbała, G. (2021). Dynamic effects of fiscal and monetary policy instruments on environmental pollution in ASEAN. *Environmental Science and Pollution Research, 28*(46), 65116-65126. https://doi.org/10.1007/s11356-021-15114-8
14. Nazeer, N., & Furuoka, F. (2017). Overview of ASEAN environment, transboundary haze pollution agreement and public health. *International Journal of Asia-Pacific Studies, 13*(1), 73-94. https://doi.org/10.21315/ijaps2017.13.1.4
15. Omri, A. (2013). CO2 emissions, energy consumption and economic growth nexus in

MENA countries: Evidence from simultaneous equations models. *Energy Economics, 40*, 657-664. https://doi.org/10.1016/j.eneco.2013.09.003

16. Radmehr, R., Henneberry, S. R., & Shayanmehr, S. (2021). Renewable Energy Consumption, CO2 Emissions, and Economic Growth Nexus: A Simultaneity Spatial Modeling Analysis of EU Countries. *Structural Change and Economic Dynamics, 57*(C), 13-27. https://doi.org/10.1016/j.strueco.2021.01.006
17. Ren, Y. S., Apergis, N., Ma, C., Baltas, K., Jiang, Y., & Liu, J. L. (2021). FDI, economic growth, and carbon emissions of the Chinese steel industry: new evidence from a 3SLS model. *Environmental Science and Pollution Research, 28*(37), 52547-52564. https://doi.org/10.1007/s11356-021-14445-w
18. Rizk, R., & Slimane, M. B. (2018). Modelling the relationship between poverty, environment, and institutions: a panel data study. *Environmental Science and Pollution Research, 25*(31), 31459-31473. https://doi.org/10.1007/s11356-018-3051-6
19. Rose, S., Ali, M. F., Bakhsh, K., Ashfaq, M., & Hassan, S. (2020). Linking environment, malaria, and agricultural returns: a labor time use analysis at different stages of production using 3SLS. *Environmental Science and Pollution Research, 27*(16), 19714-19723. https://doi.org/10.1007/s11356-020-08507-8
20. Saidi, K., & Hammami, S. (2015). The impact of energy consumption and CO2 emissions on economic growth: Fresh evidence from dynamic simultaneous-equations models. *Sustainable Cities and Society, 14*(1), 178-186. https://doi.org/10.1016/j.scs.2014.05.004
21. Thanh, P. N., Phuong, N. D., & Ngoc, B. H. (2019). Economic integration and environmental pollution nexus in ASEAN: A PMG approach. In V. Kreinovich, N. Thach, N. Trung, & D. Van Thanh (Eds.), *Studies in Computational Intelligence, 809* (pp. 427-439). Springer Cham. https://doi.org/10.1007/978-3-030-04200-4_31

COVER LETTER

AUTHORS

Corresponding author: Supriyanto
Position/Degree (affiliation): Lecturer in Mathematics and Natural Scince/Doctor (Universitas Jenderal Soedirman)
Address: Jl. Profesor DR. HR Boenyamin No.708, Dukuhbandong, Grendeng, Kec. Purwokerto Utara, Kabupaten Banyumas, Jawa Tengah 53122
Personal university web page: http://fmipa.unsoed.ac.id/v4/dosen/supriyanto/
Email: Supriyanto2505@unsoed.
Phone: +628122955108
ORCID: https://orcid.org/0000-0002-0735-9011
Researcher ID:
Submission date: 01 November 2022
Author Contributions:

Conceptualization	☒	Investigation	☐	Software	☒	Writing – original draft	☒
Data curation	☒	Methodology	☒	Supervision	☐	Writing – review & editing	☐
Formal analysis	☒	Project administration	☐	Validation	☐		
Funding acquisition	☐	Resources	☐	Visualization	☐		

Author: Wiwiek Rabiatul Adawiyah
Position/Degree (affiliation): Lecturer in Economics / Dean / Proffesor (Universitas Jenderal Soedirman)
Address: Jl. Profesor DR. HR Boenyamin No.708, Dukuhbandong, Grendeng, Kec. Purwokerto Utara, Kabupaten Banyumas, Jawa Tengah 53122
Personal university web page: http://feb.unsoed.ac.id/en/prof-wiwiek-rabiatul-adawiyah-m-sc-ph-d-2/
Email: wiwiek.adawiyah@unsoed.ac.id
Phone: +628122955965
ORCID: https://orcid.org/0000-0002-8201-1947
Researcher ID:
Submission date: 01 November 2022
Author Contributions:

Conceptualization	☒	Investigation	☐	Software	☐	Writing – original draft	☐
Data curation	☐	Methodology	☒	Supervision	☐	Writing – review & editing	☒
Formal analysis	☐	Project administration	☒	Validation	☐		
Funding acquisition	☐	Resources	☐	Visualization	☐		

Author: Arintoko
Position/Degree (affiliation): Lecturer/Coordinator of Economics Education Undergraduate Program/ Doctor (Universitas Jenderal Soedirman
Address: Jl. Profesor DR. HR Boenyamin No.708, Dukuhbandong, Grendeng, Kec. Purwokerto Utara, Kabupaten Banyumas, Jawa Tengah 53122
Personal university web page: http://feb.unsoed.ac.id/id/dr-arintoko-s-e-m-si-2/
Email: arintoko@unsoed.ac.id
Phone: +628122761335
ORCID: https://orcid.org/0000-0002-7246-546X
Researcher ID:
Submission date: 01 November 2022
Author Contributions:

Conceptualization	☒	Investigation	☒	Software	☐	Writing – original draft	☐
Data curation	☐	Methodology	☒	Supervision	☐	Writing – review & editing	☒
Formal analysis	☐	Project administration	☐	Validation	☐		
Funding acquisition	☐	Resources	☐	Visualization	☐		

Author: Dijan Rahajuni
Position/Degree (affiliation): Lecturer /Master (Universitas Jenderal Soedirman)
Address: Jl. Profesor DR. HR Boenyamin No.708, Dukuhbandong, Grendeng, Kec. Purwokerto Utara, Kabupaten Banyumas, Jawa Tengah 53122
Personal university web page: http://feb.unsoed.ac.id/en/dra-dijan-rahajuni-m-si/
Email: dijan.rahajuni@unsoed.ac.id
Phone: +628562704462
ORCID: https://orcid.org/0000-0001-6665-2544
Researcher ID:
Submission date: 01 November 2022

Author Contributions:

Conceptualization	☐	Investigation	☐	Software	☐	Writing – original draft	☐
Data curation	☐	Methodology	☐	Supervision	☒	Writing – review & editing	☐
Formal analysis	☐	Project administration	☒	Validation	☒		
Funding acquisition	☐	Resources	☐	Visualization	☒		

Author: Nunik Kadarwati
Position/Degree (affiliation): Lecturer / Master (Universitas Jenderal Soedirman)
Address: Jl. Profesor DR. HR Boenyamin No.708, Dukuhbandong, Grendeng, Kec. Purwokerto Utara, Kabupaten Banyumas, Jawa Tengah 53122
Personal university web page: http://feb.unsoed.ac.id/en/dra-nunik-kadarwati-m-si/
Email: nunik.kadarwati@unsoed.ac.id
Phone: +6282135363694
ORCID: https://orcid.org/0000-0001-5738-9772
Researcher ID:
Submission date: 01 November 2022

Author Contributions:

Conceptualization	☐	Investigation	☒	Software	☐	Writing – original draft	☐
Data curation	☐	Methodology	☐	Supervision	☒	Writing – review & editing	☐
Formal analysis	☐	Project administration	☐	Validation	☒		
Funding acquisition	☐	Resources	☒	Visualization	☐		

ACKNOWLEDGEMENT(S): -

Dear Editor,

Attached is the manuscript titled **"Economic Growth and Environmental Degradation Paradox in ASEAN: A Simultaneous Equation Model with Dynamic Panel Data Approach"** to be considered for publication in the**"Environmental Economics"**journal.

The material submitted for publication is my(our) own original work which I(we) agree to submit and publish in**"Environmental Economics"**journal.

This work has not been submitted anywhere else and is not under consideration by any other journal and/or conference committee. I(we) am(are) responsible for all materials presented in the manuscript and confirm that any part of it doesn't contain plagiarism in all its forms.

Signature	Date	Author
		Supriyanto
		Wlwiek Rabiatul Adawiyah
		Arintoko
		Dijan Rahajuni
		Nunik Kadarwati

*please fill in this form, print, sign (**handwritten signatures**), scan and send us by e-mail

BUSINESS PERSPECTIVES

LIMITED LIABILITY COMPANY
«CONSULTING PUBLISHING COMPANY
«BUSINESS PERSPECTIVES»

Hryhorii Skovoroda lane, 10, Sumy, 40022, Ukraine
Phone: +380 542 221707

http://businessperspectives.org
head@businessperspectives.org

PUBLICATION AGREEMENT

LLC "CPC "Business Perspectives", hereinafter – "Publisher" and Supriyanto, (Master, Faculty of Mathematics and Sciences, Jenderal Soedirman University, Indonesia), Wiwiek Rabiatul Adawiyah, (Professor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia), Arintoko, (Doctor, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia), Dijan Rahajuni, (Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia), Nunik Kadarwati, (Master, Faculty of Economics and Business, Jenderal Soedirman University, Indonesia), hereinafter – "Author" agree on the following:

The Publisher agrees to publish the manuscript « Economic growth and environmental degradation paradox in ASEAN: A simultaneous equation model with dynamic panel data approach» in Vol. 13, Issue 1, year 2022, by the Author(s) as an open-access article (the article will be available to all users immediately upon publication without registration on the site and embargo period) in the journal "Environmental Economics" (1998-6041 (print), 1998-605X (online)), hereinafter – "Journal".

Please provide funding data:

1. Funding organization name: Universitas Jenderal Soedirman, Indonesia
2. Funder ID: None
3. Award number: None

Please check the consents:

V 1. The Author(s) confirms that there is no conflict of interest to be declared. Please check the box if you agree with this statement.

If you disagree with this, it should be stated in the box below.

V 2. The Author(s) gives a permission to use his/her ORCID record to connect with articles DOI on the Publishers website.

V 3. The Author(s) gives a permission to access to read data available to trusted parties in their records automatically whenever a new work associated with your ORCID is found in Crossref system – from the Publisher (after your work is published, please check your ORCID inbox notifications from Crossref).

V 4. The Author guarantees that names of all co-authors of the paper are listed properly and in the right order, and their identities haven't been falsified (including the Author's ones). The Author confirms to have been authorized to sign this agreement on behalf of all co-authors.

V 5. The Author certifies that all material in the manuscript is original; any parts of it have never been published before, and have not been submitted or accepted for publication elsewhere.

BUSINESS PERSPECTIVES

LIMITED LIABILITY COMPANY
«CONSULTING PUBLISHING COMPANY
«BUSINESS PERSPECTIVES»

Hryhorii Skovoroda lane, 10, Sumy, 40022, Ukraine
Phone: +380 542 221707

http://businessperspectives.org
head@businessperspectives.org

V 6. The Author retains copyright to the contents of the article, grants the Publisher the right for the first publication of the article, and agrees on the distribution of the published article under conditions of CC BY 4.0 (Creative Commons Attribution (CC BY) 4.0: allows content to be copied, adapted, displayed, distributed, re-published or otherwise re-used for any purpose including for adaptation and commercial use provided the content is attributed).

V 7. The Author(s) confirms to have read Editorial Policies and Publishing policies sections and comply with these policies.

V 8. The Author(s) agrees to adhere to the following self-archiving permissions for the different versions of the paper.

8.1. The Author(s) may deposit *pre-print* version of the paper (manuscript by the Author, submitted to the Journal, before peer-review and without any editorial amendments) to any platform anytime with acknowledgement to the Publisher and the Journal (acknowledgement should be made as follows: *"This is a pre-peer-reviewed version of the paper submitted for publication to [name of the Journal] published by LLC "CPC "Business Perspectives"*).

8.2. The Author(s) may deposit *post-print* version of the paper (accepted version of the manuscript after peer-review and content amendments, but before copyediting, typesetting and proof correction) to the author's personal website (provided that it is non-commercial) and to the repository of the author's institution (provided that it will not be made publicly available until publication by the Publisher) with acknowledgement to the Publisher and the Journal (acknowledgement should be made as follows: *"This is an accepted peer-reviewed version of the paper. The published version of the paper is available at LLC "CPC "Business Perspectives" athttp://dx.doi.org/[DOI of the article]"*).

8.3. The Author(s) may deposit *published* version of the paper (final edited and typeset version that is made publicly available by the Publisher and can be considered an article) to any institutional repository, and distribute and make it publicly available in any way with acknowledgement to the Publisher and the Journal (acknowledgement should be made as follows: *"This is a published version of the paper, available at LLC "CPC "Business Perspectives" athttp://dx.doi.org/[DOI of the article]"*).

The Author_____
(sign here)

Wiwiek Rabiatul Adawiyah
Professor
Faculty of Economics and Business
Jenderal Soedirman University
Indonesia