03

BUKTI KORESPONDENSI

Jurnal :

REGIONAL STATISTICS
(VOL. 11 No. 4 2021)

Judul Artikel :

“Total Factor Productivity Convergence of Indonesia Provincial Economies, 2011 - 2017”

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Ibnu Nur Hamzah
## DAFTAR ISI

1. **Article Submission** .................................................................................................................. 4  
   1.1 Article submission dari author ................................................................................................. 4  
   1.2 Konfirmasi dari Editor jurnal .................................................................................................. 4  

2. **Review Article Process** ............................................................................................................ 5  
   2.1 Hasil review dari Editor dan reviewer ...................................................................................... 5  
   2.2 Author menyerahkan revisi ....................................................................................................... 9  
   2.3 Hasil review ke 2 ..................................................................................................................... 10  
   2.4 Author menyerahkan revisi ke-2 ............................................................................................ 11  

3. **Accepted Journal Publication** .................................................................................................. 12  
   3.1 Pemberitahuan oleh Editor dan Letter of Acceptance .............................................................. 12  

4. **Published Online** ..................................................................................................................... 18  

Catatan: korespondensi dengan Editor Jurnal di awal dilakukan oleh Mohammad Zeqi Yasin kemudian dilanjutkan oleh Rudi Purwono
Regional Statistics is pleased to announce a new service for our authors and readers: Online First, the immediate online publication of all accepted papers as soon as the authors have returned the corrected proofs. Whereas the electronic versions of Regional Statistics used to appear at the same time as the print journal, from now on the electronic version of all articles will be available via the internet weeks before the printed version appears. This means an enormous reduction in publication time. It will no longer be necessary for manuscripts to wait until the “next available issue”.

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- Motivations and locational factors of FDI in CEE countries: Empirical evidence from South Korea FDI in Kazakhstan, Russia and Uzbekistan – Han-Sol Lee – Serebry, Z., Chernyshov, Y. – Szabó Mária (pdf, 342 KB)
- Impact of provincial human capital on TFP growth through the FDI channel: The case of Indonesian manufacturing industries – Gading Ramdhan (pdf, 361 KB)
- Economic and crime cycles: synchronization across states in Mexico: A dynamic factor model approach – Víctor Hugo Torres Preciado – Naelson Omar Muñiz Torrego (pdf, 672 KB)
- Total factor productivity convergence of Indonesia’s provincial economies, 2001–2017 – Rudi Purwanto – Mohammed, Zed Yasse – Bin Musa Hamzah – Nor Azlin (pdf, 1 915 KB)
- The handling of the blockade against Qatar from the perspective of Qatar Airways’ resilience – Emir Kucera (pdf, 2 748 KB)
- Urban growth and language shift in county seats in Transylvania between 1900 and 2011 – Ferenc Solymosi – Tibor Elek (pdf, 349 KB)
1. Article Submission

#21 Desember 2020
Submission awal dan submission revisi oleh Penulis dilakukan melalui email Regional Statistics. Respon Editor diberikan melalui email

#4 Januari 2021
Konfirmasi Submission oleh Editor Jurnal
2. Review Article Process

#12 April 2021

Hasil Review dari Editor dan Reviewer, Deadline penyerahan revisi 12 Mei 2021

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[Email exchange]

**To: Tôth Déza <Geza.Toh@kek.hu>

Dear Colleague,**

the first review was received. We are waiting for the second. Unfortunately, the second reviewer unfortunately caught the cold, he was also in the hospital. He promised to send, but so far he hadn't. Please be patient, I will try to send reviews.

---

**To: Tôth Déza <Geza.Toh@kek.hu>

Dear Colleague,**

Fortunately the reviewer has recovered. So please find the reviews below and attached.

Best regards

Geza Tôth

Regional Statistics review form

1. Title: Total Factor Productivity Convergence of Indonesian Provincial Economies

<table>
<thead>
<tr>
<th>Article rating</th>
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<tr>
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<td>Does the title reflect the contents?</td>
<td>Yes</td>
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<tr>
<td>Is the abstract clear enough and does it reflect the contents of the article?</td>
<td>Yes</td>
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</table>
The paper examines beta- and sigma-convergence of total factor productivity (TFP) among Indonesian regions for the period 2011-2017. Using various econometric methods, the authors find that intra-trade processes catching up in regional productivity while intra-trade reduces productivity disparities amongst provinces. The paper is well-written. The topic is interesting and original: the paper contributes to the literature about the impact of trade on regional productivity. Nevertheless, there are some econometric concerns regarding model selection and robustness issues that determine the reliability of the analysis. Moreover, I encourage the authors to check the documentation with a digital writing assistant tool or a native speaker.

Suggestions

1) Arellano-Bond

- Summary statistics in Table 3 suggest that the temporal variation in TFP is only moderate. The Arellano-Bond estimator has been found to have poor finite sample properties if the series are highly persistent. In such cases, lower levels of the dependent variable are weak instruments. I would recommend using system-GMM estimation and experimenting with lagged first-differences of the series at least for robustness checks (see e.g., Bond 1999).

2) Trade

- Although the paper aims to examine the effects of intra- and inter-regional trade on the convergence of TFP, the authors do not address the issues concerning the identification of the effects of trade. Probably the most daunting issue is the endogeneity of the TRADE variable. I wonder whether the authors made any attempts to address this problem.

- The authors use a quite complex measure to assess the relative role of intra- and inter-trade on regional convergence. Separate variables for the intensity of inter- and intraregional trade would be more informative about the absolute and relative role of trade types.

3) Robustness
3) Robustness

- As it is well known, the winsor-estimator is inconsistent in panel dynamic settings, especially when the time span is short. The authors are aware of this (they point this out at page 6) but for some reason they still use this method for robustness checks. I do not think using FE or even pooled OLS would be an adequate way to check for robustness. Even if the Nickel-84m (which is the inverse of T) would be small enough, the endogeneity of level variables would still be an issue. As mentioned above, system GMM might be a good choice to check whether the results are robust to the choice of methods and instrument sets.

4) Components of TFP

- It would be interesting to examine convergence in efficiency and the effects of trade.
Review

Total Factor Productivity Convergence of Indonesia Provincial Economies

Summary

The paper has two main parts. First, it estimates two concepts of productivity: a frontier level, and a relative inefficiency. The dataset is in a panel of 34 Indonesian provinces over 7 years. After recovering total factor productivity and its two components, the study estimates models of beta and omega convergence, and the possible role of intra- and inter-regional trade in the convergence process.

Main comments

I think the research question and the first step in the procedure make sense and are reasonably executed (that see my detailed comments below as well). I have more problems with the second step, and in particular with the identification of the impact of trade. I also think that exposition can be improved significantly.

With regards to trade, I do not understand why the measure used is the ratio of intra- and inter-regional trade to the ratio of the two. This way, even if both have a positive impact on convergence, we will find a negative coefficient if inter-regional trade contributes more to convergence than intra-regional trade. Why not include both measures in the regression separately?

In terms of the exposition, I find some of the description unclear. In particular, there should be a much more detailed data section explaining the variables, for example, are the main variables nominal or real? If the former, how do the authors handle inflation? English is ok, but could be improved, especially in the Abstract.

Finally, I think what ultimately the paper’s contribution is. Is it the productivity estimation, the trade variable in the convergence regressions, or something else? Please be very clear what is new relative to the literature.

Detailed comments

1. Page 3: I find the intra- and inter-regional trade terminology a bit confusing. To me the former suggests trade within provinces and the latter trade within provinces. My understanding is that the authors use them differently: the first being trade among provinces and the latter meaning international trade. I suggest intra-provincial and international trade as alternatives. I would also not use the shortcuts “intra” and “inter” - it is more professional to write out the full terms.

2. Page 3: I do not see a definition of the term “AFTA”. This might be obvious to you, but not to the general reader. There are other examples in the text where definitions should be more clear or more prominent.

3. Page 3: I do not understand why inefficiency should be a function of time alone (eq. [2]). Why not geography, institutions, or trade? Explain why this assumption makes sense.

4. Page 4: Define the function $f_2()$. If you did that is the non-stochastic part of the translog production function, but you have to say so.

5. Page 4: I do not understand what $Z_{t2}$ means in eq. [20] - I guess this is in a shortcut for eq. [22]?

6. Page 4: How do you estimate the production function (eq. [22])? The typical problem here is the endogeneity of inputs (inputs and labor) to exogenous productivity (the error term). If you are treating inputs and labor as exogenous, you should also estimate growth and subsequent
#2 Mei 2021

Pengumpulan revisi.
#19 Mei 2021

Hasil review tahap 2

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**Review**

**Total Factor Productivity Convergence of Indonesia Provincial Economies**

祖父: The variables are in nominal. We have added another paragraph to clarify this (see page 6).

祖父: You should note in the paper that an aggregate price deflator may not be adequate for regional GDP.

祖父: Page 5: Define the function (f) if it underestimates the non-stochastic part of the total production function, but you have to say so.

祖父: I simply pointed out that the function (f) is not defined in the paper. I guess it is the production function, but be specific.

祖父: Page 8: How do you estimate the production function (eq. 17)? The typical problem here is the endogeneity of inputs (capital and labor) to exogenous productivity (the error term).

祖父: If you are using this, I believe you need another discussion in the paper.

祖父: I do not think that you understood my question. I am talking about the possibility that the choice of inputs (capital and labor) is endogenous to the level of TFP. This has nothing to do with the fact that TFP is not just technological progress. As the micro-level, see Olley and Pakes (1996) and Levinsohn and Petrin (2003).

祖父: Page 8: You talk about a correlation between an initial level of growth and subsequent growth. This is incorrect. Convergence means a negative correlation of the initial level of TFP and its subsequent growth. I guess you are doing the right thing, but saying the wrong one.

祖父: This is just a confusion in terminology. In the paper you said initial “growth” instead of capital “level.” I was referring to that.

祖父: Page 10: You say “negative productivity”, which probably should be “negative productivity growth”.

祖父: Productivity cannot be negative, its growth rate can be. Again, this is probably just terminology.

祖父: References:


#20 Mei 2021

Revisi kedua dikirim
3. Accepted Journal Publication

#14 Juli 2021

Pemberitahuan dari Editor bahwa artikel diterima.
#17 Agustus 2021

Tim Produksi memberitahukan bahwa sedang dilakukan tahap layout dan terdapat beberapa poin yang perlu diklarifikasi dari manuskrip.
Total factor productivity convergence of Indonesia’s provincial economies, 2011–2017

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Ibnu Nur Hanumah
Email: nhanumah@university.ac.id

This study aims to investigate the potential convergence process of total factor productivity (TFP) among 33 provinces in Indonesia in a period between 2011 and 2017. It is the first study that captures the effect of intra-provincial trade and international trade on the TFP convergence. The authors employ stochastic frontier analysis to identify the TFP and panel estimation method of moments (GMM) to examine the convergence process. The results of this study confirm that the TFP convergence process in Indonesia occurred in 2011–2017. Concerning intra-provincial and international trade, the study discovered that neither of them promotes TFP growth. Rather, except for the international import, they reduce the gap of TFP growth among provinces. The result demonstrates that inter-provincial exports reduce the TFP growth gap by 19.7% more than international exports. This finding indicates that inter-provincial exports are more efficient in reducing regional inequality. The same is true for the intra-provincial import. This finding differs from past studies that the gap of TFP growth among provinces can be explained by the lack of research on regional inequality.

Hypothesis for OLS (null hypothesis) (H0) that is \( \rho = 0 \) or the coefficients of interest are zero is the hypothesis for OLS. The test of OLS is based on the likelihood ratio test statistic. The likelihood ratio test statistic is obtained from a log-likelihood statistic. The log-likelihood statistic is obtained from the maximization of the log-likelihood function of OLS. The null hypothesis is rejected if the log-likelihood value is less than the critical value with degrees of freedom equal to the number of parameters involved in the restrictions.

**Total factor productivity**

This study adopts the method of Amano et al. (2014) to estimate TFP which is in a geometric approach that decomposes TFP into two components: technical efficiency change (TEC) and technical change (TC). The formula to obtain the components are shown below:

\[
\begin{align*}
\text{TFP}_t &= \text{TEC}_{t-1} \times \text{TC} \times \rho_{t-1} \times \rho_{t-1}^2 \\
\text{TEC}_t &= \text{TEC}_{t-1} \times \rho_{t-1} \\
\text{TC}_t &= \text{TC}_{t-1} \times \rho_{t-1} \\
\rho_{t-1} &= \rho_{t-1}^2 \\
\end{align*}
\]

Where TFP is total factor productivity, TEC is technical efficiency change, TC is technical change, obtained from (2) and (2c) and (2d). TEC is technical change. As this approach is a geometric mean, TFP, TEC, TEC, and TC imply positive impacts.
Figure 1 illustrates that there is a downward trend of technical efficiency among provinces in Indonesia in 2011–2017. This condition is exacerbated by the decision’s abrupt trend since 2013. This suggests that inequalities of efficiency scores between provinces increase along with their concurrent technical efficiency on average. The distribution of technical efficiency (TE) scores, total factor productivity growth (TFP), technical change (TC), and technical efficiency change (TEC) are shown in Figure A1 (in the Appendix).

Table 3 reports the estimation result of TFP and its decomposition that consists of technical efficiency change (TEC) and technical change (TC).

According to Table 3, on average, Indonesia’s previous experience shows negative TFP growth (-0.15%) during the 2011–2017 period. Concerning sub-periods, 2011–2013 shows a positive TFP growth at 0.36%, in contrast with 2015–2017 that shows a negative TFP growth at -1.14%. The three largest TFP growths are those in North Sulawesi (9.4%), Banta (6.7%), and Jakarta (2.2%). Meanwhile, the three largest negative TFP growths are found in East Nusa Tenggara (-4.8%), Riau (-4.8%), and Bangka (-1.5%). Meanwhile, TC experiences a positive improvement at 0.39% in 2011–2017. This suggests that Indonesia’s provinces have demonstrated a technological progress in terms of the contribution of capital and labor towards obtaining GDP. This study proves that three regions which demonstrated the largest technological progress are all on Java Island: Jakarta (1.2%), East Java (1.2%) and West Java (1.1%). This finding indicates that the shifting frontier of capital and labor generating output remains relatively centralised in the area of

Reference:

Regional Statistics, Vol. 11. No. 4. 2021
Online first Pursu, Yani–Hadad, 1–27. DOI: 10.15194/RSS10403
Table 3

<table>
<thead>
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</table>

Note: *, **, *** represent significance at alpha 5%, 1%, and 0.1%, respectively. AR(2) and AR(3) tests for autocorrelation in the residuals. Lagrange multiplier tests for cross-sectional dependence of the residuals. The model is also robust according to sub-sample checks, whose results are provided in Table A2 and Table A3. The model has been approved by the authors.
Figure A1
Distribution of technical efficiency (TE) scores of 33 provinces in Indonesia
- 20% upper TE score
- 25% upper-mid TE score
- 25% lower-mid TE score
- 20% lower TE score
Not included in the analysis.
Source: Authors (based on own estimation).

Figure A2
Distribution of total factor productivity growth (TFP) of 33 provinces in Indonesia
- 25% upper TFP
- 25% upper-mid TFP
- 25% lower-mid TFP
- 25% lower TFP
Not included in the analysis.
Source: Authors (based on own estimation).
4. Published Online

#24 Agustus 2021

Pemberitahuan dari Penerbit bahwa artikel telah terpublikasi secara online pada link

https://www.ksh.hu/terstat_eng_online_first

Dear Colleague,

I'm happy to say that your paper has been published and now it's available as an online first paper: [https://www.ksh.hu/docs/hun/site/terstat/2021/rs130903.pdf](https://www.ksh.hu/docs/hun/site/terstat/2021/rs130903.pdf)

Thank you for your cooperation!

The full issue will be published in September, we will post the hard copies of course!

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Best regards