

## 論文審査の要旨

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| 博士の専攻分野の名称  | Ph.D.   | 氏名 | ERIK ARMUNDITO |
| 学位授与の要件   | 学位規則第4条第①・2項該当  |    |                |
| 論文題目<br>Impact of Energy Efficiency Improvement on Productivity in Indonesia Manufacturing Sector   |   |    |                |
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| 〔論文審査の要旨〕   |   |    |                |
| <p>Manufacturing sector is important for Indonesia as one of growth engines among others. Thus, the improvement of productivity in manufacturing sector is required in particular for absorbing young laborforces due to demographic bonus and strengthening trade competitiveness. Moreover, recent transition of the country from exporter to importer of oil as well as global concern on climate change call for environmentally sound productivity improvement to Indonesian manufacturing firms. With use of DEA (Data Envelopment Analysis), DDF (Directional Distant Function), Malmquist productivity index, and Malmquist-Luenberger productivity index, the study empirically analyzes productivity changes over the past 20 years for large and medium Indonesian manufacturing firms with and without considering CO<sub>2</sub> emissions. To our best knowledge, this is the first study for measuring environmental productivity of firms in Indonesia. The study found that three periods: 1990-1995; 1998-2000; and 2008-2010, improves environmental productivity, whereas the period of 2004-2006 deteriorated the productivity. On the other hand, sectoral average carbon abatement costs were increased in the periods of 2004-2006 and 2008-2010, when frontier firms relatively improved the productivity, and thus the gap with inefficient firms was widened.</p> <p>The dissertation consists of 6 chapters beginning with contextual background, motivation and objectives of the study in Chapter 1. Chapter 2 explains methods of data cleaning and construction of panel data covering from 1990 to 2010. Chapter 3 provides baseline productivity measurements with/without considering CO<sub>2</sub> emissions. Chapter 4 evaluates carbon abatement costs under the hypothetical case where CO<sub>2</sub> emission is regulated. Chapter 5 analyzes the relationship between energy price and environmental productivity as well as carbon abatement cost. Chapter 6 summarizes main findings and concludes with the policy recommendations.</p> <p>As a part of findings of the dissertation, the applicant has published one refereed article in international journal.</p> <p>In conclusion, all the examiners unanimously judged that academic contributions of the dissertation in environmental economics and the achievements of the applicant are qualified for the Ph.D. of IDEC, Hiroshima University.</p> |   |    |                |