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Dr hab. Julita Wasilczuk, prof. PG
Wydział Zarządzania i Ekonomii
Politechnika Gdańska

Recenzja rozprawy doktorskiej

Mgr pt.: Aurélio Hess

„ Productivity Drivers: Implications for Brazil’s Development - Evidence From Selected Countries”

Supervisor: dr hab. Teresa Kamińska, prof. UG

Sub-supervisor: dr Małgorzata Zielenkiewicz

Podstawą formalną do sporządzenia recenzji pracy doktorskiej mgr Aurélio Hess pt.: „ *Productivity Drivers: Implications for Brazil’s Development - Evidence From Selected Countries*”, stanowi pismo z Prodziekana Wydziału Ekonomicznego Uniwersytetu Gdańskiego, dr hab. Przemysław Borkowski prof. UG. Recenzja została sporządzona w języku angielskim, zgodnie z językiem samej rozprawy.

Dissertation topic assessment

The subject of the dissertation: *Productivity Drivers: Implications for Brazil’s Development - Evidence From Selected Countries* is an important topic for several reasons. First, the cross-sectional works showing and comparing the situation in many countries is valuable. In this case, these are the G7, BRICS and EU11 countries (author’s conscious narrowing down to 11 out of 27(28) EU). Second, it is certainly an important source of information for the Brazilian policymakers, and maybe can be use in other countries in this region. I hope the results will be noticed and used to improve the economic situation of the region. Third, the topic itself, regardless of the country, is particularly important in the current pandemic situation, where in most countries we expect a significant economic stagnation (if not a regression). The fact that the Author comes from Brazil and the Promoter from Poland is also important for the cognitive value of the work. Finally, those two countries (Poland and Brazil) were compared, and a thorough understanding of the cultural and economic situation of both countries certainly contributed to the improvement of the quality of this work.

Assessment of goals and hypothesis

In the fourth paragraph of the introduction (p. 9), the Author indicated as the goal: "expand the body of knowledge about productivity enhancements and offer recommendations to Brazil's policymakers", the consequence of which is the research question: "what can Brazilian policymakers learn about productivity drivers in other countries in order to further Brazil's development". On page 11, the Author indicated a slightly different goal: "to learn from other countries how to increase productivity, by investigating its drivers in selected countries", which ignores the aspect of the recommendation for Brazil. This is probably a minor editorial mistake, however, there are more such mistakes in the work - and especially in the introduction, they should not happen. In almost every scientific work, as well as in a scientific application, it is the introduction that is particularly read and analyzed. And I believe that the combination of a purely scientific goal (indication of growth factors) and an application goal (recommendations for Brazilian's policy makers) is particularly valuable. The soft term used in the second version of the goal: "to learn from other countries", there is no such strong indication of the implicative nature of the research results.

A refinement of generally stated goal and research question are minor objectives. The author noted in the introduction that these are four minor objectives, while the list on page 11 includes six of them, therefore I stick on this version:

1. Create a synthesis from economic theory regarding productivity and its drivers;
2. Undertake a comprehensive literature review of the findings from other investigations about productivity drivers in all the countries participating in this study, from 1990 to 2019
3. Compare the average TFP—of individual countries and groups— of G7 economies, of BRICS economies, EU 11 economies, during the period from 1990 to 2017; to verify the hypothesis of homogeneity; and to establish a benchmark economy that could be used to draw comparisons with Brazil and provide models for best practices concerning productivity;
4. Create correlational studies to examine the fundamental relations between the dependent variable, productivity, and the independent variables, human capital, capital formation, education and health investments, government expenditure in R&D, and governance rules;
5. Compare the correlational studies between the identified benchmark and Brazil's economy, to grasp which strategies have been used successfully in the benchmark economy and to compare them with strategies used in Brazil;
6. And finally formulate recommendations for Brazil's policymakers

I have no major objections about the formulation of the main goal and specific research goals. Both from scientific, as well as from practical point of view they are important, contribute by

disseminating the effects of achieving these goals to the improvement of the situation of many societies. All the goals were fulfilled successfully.

I cannot explicitly evaluate the hypotheses because they were not clearly described in the dissertation. First something like hypotheses appeared at page 143 as a consequence of conducting literature review and analyzing the results obtained at the first stage of research. The Author indicated four groups of factors which were subjected to statistical verification later in the next chapter. However on the page 153, Author once more presented something which seems to be hypotheses, which are not consistent with those on p. 143. First of all, there are nine of them, some were previously presented on page 143, however some are new (e.g. investment in education). I wonder, what is the relation between hypotheses on 143 pages and 153? If, however, I were to answer the question whether the hypotheses have been verified, I would be inclined to answer in the affirmative.

Assessment of the dissertation composition

The dissertation consists of four chapters, introduction and conclusions and of course the lists of: tables, figures and references. Just after the introduction, there is an interesting part: how the work is organized. I think that this should be a part of the introduction, not a separate point.

I have some remarks concerning the composition of the dissertation. I believe that both chapter titles and material distribution between chapters should be arranged differently. A large disproportion appeared between the volume of the chapters. The first is just over 20 pages, the second almost 100 pages, the third about 50 pages. Of course, it is not a dogma to stick to exactly the same number of pages and is justify if this is due to the impossibility of dividing the material differently. In this case, however, the second chapter could successfully cover only point 2.1.

The dissertation lacks a methodological chapter, the details of the research stages carried out are placed in various parts of the work and do not allow to determine the correctness of the choice of methods and tools. And since the work is very long, I think it would be possible to successfully skip the first chapter (or shorten it and put as a sub-section), which does not bring new knowledge. Later in the review, this note will be expanded upon.

Substantive assessment of the dissertation

First chapter

Chapter one was titled: productivity, its drivers and main measurements methods (theoretical framework). It is mainly a description of the productivity theories. I wonder if there is

any point for a dissertation in invoking a history of productivity research based on one work (Metcalf). All the more so as nothing follows from this set of theoretical considerations. There is no summary that would introduce the next points of work. The only summary is one sentence indicating three measures: average productivity of labor, average productivity of capital, and total factor productivity "as essential to this work". However, there is no indication where in the research process these measures will be used. In fact, only two of the three (Average Productivity of Labor and Total Factor Productivity) are used to validate the hypotheses in chapter three. These three measures appear again in chapter four of the work, in two tables, 33 and 34. Without explanation at the end of chapter one, it is not known what the purpose of this was.

Minor remarks:

I think that the a sub- section (1.1.), should not has the exact same title as the whole chapter, moreover, is the only sub-section at this level in this chapter. It would be much better to introduce sub-sections corresponding to three areas enumerated in the chapter title: productivity; productivity drivers; measurements methods.

The intriguing entry on page 20: "but explanations for its behavior are controversial" is worth developing without leaving the reader to himself.

I consider this chapter the weakest in the whole work. It describes commonly known theories, but adds nothing new. Too little scientific discussion, limited only to the description of economic theories about economic growth.

Second chapter

After disappointment in first chapter, I highly evaluated the second one. It contains an analysis of 500 articles (if I understand correctly the entry on page 36). These articles came from the years 1990 - 2019, which is another plus, because it proves that the Author, while preparing his dissertation, kept track of the published literature. This analysis has enabled to list a dozen productivity drivers, which were grouped and then reduced to the most important ones.

I highly appreciate the detailed and very interesting description provided in point 2.1. This material is so reach, that in my opinion should be summarized somehow, maybe in tabular form. The perfect way, would be moved here the table 33, and 34 from chapter four. This table would be a clamp linking the conclusions from first chapter, regarding some essential productivity measure, and a rich description of factors influencing this output. In a sense, the role of summary plays point 2.2. but in my opinion this point should be moved to the methodological chapter.

The value of the second chapter is to collect a large number of different factors that are apparently obvious but not very often studied, at least not in the mainstream. Perhaps one should consider whether, due to such extensive material, not to omit those less important as, for example, the relationship between BMI and productivity. On the other hand, their inclusion in the description shows how sometimes surprising factors are the subject of research.

It should also be noted that in the conducted review, human capital (often present in economic theory) ceased to be anonymous and took the form of, for example, managers (pp. 61, 113), "soft skills" (p. 66), sociological aspects (p. 73) and other aspects (e.g. honesty as a personal value).

The second part of the chapter is an analysis of the factors described above - a total of 835 from three groups of countries (G7, BRICS, EU11). Here, unfortunately, I have to make a reservation about the lack of a description of the method of their identification. A total of 835 "pieces of evidence" were selected, but it was not specified according to which key (key words), what the selection looked like, how many and for what reason were rejected. It also does not describe the relationship between the 500 articles described in 2.1. and described "pieces of evidence" in section 2.2. Certainly it was arduous work, being an element of the research methodology and therefore it is worth describing.

Third chapter

The third chapter is devoted to testing research hypotheses. The first step was to search for a group of countries that could be a benchmark for Brazil. Based on the tests performed (1, 2 and three), Author showed that no group of countries shows homogeneity. Therefore he started the search for a single country that could serve as a benchmark. I read with interest the description of tests 4, 5 and 6, which led to the selection of this country. Although it is a bit surprising that the result of these tests indicated Poland, the country where Author's accomplished his doctoral studies.

Author proved his knowledge of statistical tools. However, if the work would be published, it is worth taking care of enriching the elements of the analysis with comments and avoiding unexplained abbreviations – e.g. JB test.

Again, the remark concerning the lack of a methodological chapter should be arise. The hypotheses listed on page 153 should be included in this kind of a chapter. However, a greater shortcoming is the lack of description of measures of factors, which were analyzed. There is no explanation whether and how the measures of independent variables influenced the choice of statistical tools.

Minor remarks:

Please explain the sentence on page 98 – “*on the other hand, the quality of publications had not increased*”.

Chapter four

Chapter four is devoted to the discussion and recommendation. It starts with the analyses of qualitative results of literature review in the form of table 33 and 34, which I think should be at the end of point 2.1. in chapter two (mentioned earlier). However, the conclusions from this table should be presented here. In a fact the conclusions are very laconic.

As a side note, the description to the table indicating that “dependent variable denoted by x is the most affected” is vague. It is not known whether the influence on the other dependent variables were also noted, but at a low level or whether the authors cited did not study them at all.

The conclusion from quantitative results (point 4.2), are more are valuable. I positively assess the inclusion in the conclusions remarks from the literature on the Brazilian economy.

Point 4.3 is the most valuable for the application value of the dissertation. Therefore, I feel a bit disappointed with the lack of expand five recommendation points at page 198 and 199. I believe that after such a laborious analysis of the literature, it was certainly possible to put in a little more effort to enrich these recommendations. I appreciate mentioning other authors, which enriched the recommendations but they should not be the ones who play the leading role in this chapter.

The Author mentioned the limitation of the dissertation in the form lack of studies of specific Polish policies and practices which could be transferred to Brazil. I think, that there is also a need to look closer at the cultural differences of our countries and some historical path dependence. Those two are very important in formulating the recommendations for the Brazil. And I would expect such an ending of this dissertation.

It would also be interesting to draw conclusions from the incompatibility of factors influencing development in particular groups of countries.

Minor remarks:

I think that the sentence on p. 191: *Quantitative results provided opportunities to improve productivity in low-productivity performers, such as Brazil*” is a bit exaggerated.

Formal assessment

The language of work is correct. However, there are many minor editorial flaws in the dissertation that should have been eliminated before submitting the work for review (e.g. diagram on page 14 versus table of contents; incorrect title of the table 26/p. 179, etc.).

The point 4.3, titled: Recommendations is started with the sentence: “in this section, the LIMITATION of the research are discussed.

The diagram on page 14, entitled "Organization", suggests that it is a reflection of the structure of the work. However, this is not true, as the structure differs significantly from what is shown in the diagram.

General assessment of the dissertation

The main caveat of this dissertation is the lack of methodological chapter, which would gather all the information about the research procedure, the methods standing behind each stage, the choice of measures, the others. Some of those information are placed in different parts of the doctoral dissertation. The methodology chapter should contain information on the procedure, partially described in chapter three. I would expect there to be information on how the hypotheses will be tested (described in section 3.1), and what will be the further path of selecting a country that can serve as a benchmark for Brazil.

However, this drawback is relatively easy to fix by introducing a methodological section and gathering all relevant information in it. The well-described research methodology can contribute to the replication of research by the other researchers.

The main value of the work is gathering evidence for the impact (or lack thereof) of over 800 different factors that can potentially affect productivity. They have been described and grouped. This longest fragment of the thesis proves the skill of selection, analysis and synthesis of the doctoral student. And it can be successfully used as a basis for the research work of other scientists. The value of practical work is to identify recommendations for policy makers in Brazil.

Despite a few polemical and critical remarks, it should be emphasized that the work has been written in a scientific language, and is interesting. And all polemical and critical remarks should be treated as possible guidelines for further scientific research on the subject or improving this dissertation, and publishing it.

Final conclusion

Stwierdzam, że rozprawa doktorska mgr Aurelio Hessa spełnia wymagania Ustawy z dnia 14 marca 2003 r. o stopniach naukowych i tytule naukowym oraz o stopniach i tytule w zakresie sztuki i wnioskuję do o dalsze jej procedowanie.

