PhD Thesis Reviewer Report

Title: *Evolution of the Economic and Monetary Union functioning in the light of optimum currency area theory and consequences of its decomposition*

Candidate: Mrs. Agnieszka Szczypińska

1. Main contributions of the Thesis:

Mrs. Szczypińska's dissertation analyses the functioning of the European Economic and Monetary Union in a framework of nominal and real convergence, and it makes an exercise to predict the impact of the European Union (EU) decomposition. An interesting point of Mrs. Szczypińska's approach is that her investigation considers both the changes in terms of social welfare (for the leaving country and the remaining members) as well as the reshape of the voting power distribution within the Council of the EU.

Indeed, the thesis develops along the following lines. First, exploiting data from several time series on macroeconomic variables, it assesses nominal and real convergences in the European Union. Second, making use of an oligopoly model, it studies the effects of the EU decomposition. The analysis considers two alternative scenarios: 1) the leaving country has its own currency, and trade can take place either within the customs union, or a preferential trade agreement, or within the World Trade Organisation's rules; 2) the leaving country belongs the euro area and is going to adopt back its national currency: in that case, the analysis is extended by considering the role of the exchange rate. Finally, making use of tools from cooperative game-theory, it evaluates the consequence of the EU decomposition on the voting power distribution in the Council to analyse the formation of potential coalitions representing common interests in particular votings (e.g. EU budget and enforcement rules).

The main results of the dissertation are as follows. The multi-stage analysis conducted (Chapter 3) provides evidence that the sustainable fulfillment of both nominal and real convergence criteria among the countries of the euro area is far away from being satisfactory. The data show that both the synchronization of business cycles and the correlation of cyclical components have taken place. Nonetheless, the first two decades of the euro adoption and the financial crisis in 2008/2009 have shown that the member states of the common currency have significant divergences in their economic structures, and EU countries often incurs macroeconomic imbalances.

The analysis of a withdrawal in terms of the impact on trade (Chapter 4.2.1) indicates that the departing country, which already uses its own currency, suffers a decrease in total welfare both under a hard exit, i.e. without an agreement (therefore under the rules of WTO), and under a soft exit, i.e. with an agreement reached in terms of unilateral trade liberalization between the departing country and the EU (which leads to the imposition of a tariff below the WTO one). If the withdrawal also implies a return to the country's own currency, the effect of the exchange rate strengthen the negative impact on welfare previously found, especially in the case an initial depreciation of the sovereign currency takes place.

Considering the Brexit case, the analysis of power distribution within the Council of the EU (Chapter 4.2.2) reveals that a withdrawal will affect the European politics, economic decisions, and the relative power of the EU Member States. The withdrawal of a large country will lead the remaining large countries to gain more power. A withdrawal like the Brexit also influences the power distribution among Member States within the coalitions that can be formed in the EU Council. Those changes are extremely likely to affect the EU policy, in particular because the analysis reveals that countries outside the euro area will see their ability to build a blocking minority lowers.

2. Scientific quality of the Thesis:

The present dissertation analyzes a subject that current events have proved to be of extreme relevance. Such an investigation is timely for its implications for competition in national and international markets.

The dissertation is based on a sound methodological approach. Its scientific quality is high-standing: the complexity of the analysis largely justify the combined use of different technical tools, ranging from time-series analysis to (cooperative and non-cooperative) game theory.

3. Organization of the Thesis:

The candidate's key ideas are clearly expressed and it helps the reader to follower her line of reasoning all through the dissertation. On the whole, the thesis is rather well-organized. I have some minor remarks which just expression of my opinion with regard to personal "editorial" preferences.

First, the dissertation is divided in several sub-sub-sections which make the structure of the text a bit fragmented. Second, at Pag.60, I would have immediately presented the results of the model that study the impact of the withdraw from the EU under the different scenarios rather than give a sudden break and introduce the subsection on "cooperative game theory", and then come back again to the oligopoly model. In other words, I would have introduced the theoretical part of "non-cooperative game theory" before the oligopoly model and then the theoretical part of "cooperative game theory" before the analysis of vote power distribution.

4. Detailed technical comments:

General comments

The methodologies to analyze the subject are appropriate, and the findings and implications the candidate derives give an important and interesting contribution to the existing literature.

As a general comments, I have a remark, and some suggestions with regard to the modelling part for further developments (i.e. publication in a scientific journal).

The remark is that it seems to me that the style of referencing is not homogeneous/coherent all over the dissertation.

The suggestion are the following. First, in the thesis, the case in which the leaving country has already its own currency (Brexit) is analyzed considering only the impact on international trade (tariff imposition), and without taking into account the role of the exchange rate (analyzed in the case the leaving country was a member of the euro area, say Grexit). One may object that in the case of Brexit, both the trade agreement and tariffs and the exchange rate elements can play a relevant role to analyze the impact of a withdrawal. Therefore, I suggest the candidate to build in the future a general model that considers both aspects, and then present the two cases described in the dissertation as special cases.

Second, for future research, it will be worth to analyze not only the effect on trade but also on capital (financial) markets. Consider how the Brexit has impacted on the decisions of 1) banks and financial institutions, moving from London to other cities within the EU; and 2) companies that are considering relocating their activities (therefore, investing) within the EU.

Specific comments:

Pag.13, four-to-last line: typo: "Thββe"

Pag.17, second to fourth line: it is mentioned

"adjustments to asymmetric shocks take place in the real sector if the *alternative adjustment mechanisms* are not effective enough."

It could be useful for the median, general, reader to report (even in parenthesis) at least one of those mechanisms as general example.

Pag.18: the reference "Torój" in the second line of the last paragraph should be "Torój (2017)" and erased after "reaction to the economic shocks".

Pag.19: Usually, when it is quoted an external source for a figure, it should be also reported the year of reference. Moreover, the reference "Sentix" should be also reported in the Bibliography.

Pag.19, lines 8-9: "The exit clause (Art. 50) provided in (The Lisbon Treaty, 2007) for...". The way of referencing should be adjusted.

Pag.29: the style of referencing seems not to be homogeneous in this page.

Pag.30, first two lines: one can read that " $A_{k,EA}$ analogically describes the share of sector k in the structure of GDP of the euro area." I am not an expert in empirical analysis, therefore, as a simple reader, I cannot capture from the description if the share of a sector k in the EA is calculated as a simple or a weighted mean of the share of that sector for the countries of the EA.

Pag.44-49: I would have moved the formal description of non-cooperative games in subsection IV.I.I (indeed, the title is "Non-cooperative game theory") and started the subsection IV.I.I.I with the sentence

"The Cournot model, in the form of an aggregative game, can be used to analyse international trade under oligopolistic competition to derive the optimal trade policy (Corchón, 2001). We adjust this approach to the EU environment and use it to analyse a withdrawal from the EU"

at the beginning of pag.49.

Pag.46: revise the formal definition of best response at the top of the page, it seems to me that there is a typo on the right-hand side of the inequality.

Pag.46: toward the end of the page, in the last paragraph, one can read

"The Cournot model helps us to derive the optimal trade policy under oligopolistic competition. It describes a market with a limited number of firms and homogenous good."

If the aim of the subsection is to give a general description of non-cooperative game theory and, as a special example, of the Cournot model, this description is slightly imperfect because the Cournot model can also consider differentiated goods. It should be specified that, in the proposed framework of the thesis, it is assumed homogeneous goods.

Pag.49: In the description of the model, one can read

"Under the assumptions of an oligopoly the product is homogeneous and the markets are segmented."

Again, I would underline that those assumption are valid for the specific model here used. I would substitute that sentence with something like:

"In the present context, it is assumed an oligopoly with homogeneous products and segmented markets"

or similar.

Pag.50: I assume that there is a typo in the expression of the consumer surplus in each market. Written in the current way, the consumer surplus in one market depends on the overall (world) consumption, X ; however, I believe that it should depend only on the consumption in the market in which consumers are, X_H.

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Pag.54-55: some issues related to the notation. $c_i^1, c_i^2, c_k^1, c_k^2$ are not defined. I assume that those are the first derivative of the cost function. For coherence, given that the first derivative with respect to the demand function are denoted with a prime, I would have done the same for the costs, i.e. $c_i'^1, c_i'^2, c_k'^1, c_k'^2$. Moreover, if I am not wrong, the cost of production for the firm is identical, no matter where the goods are sold . Therefore, the apex 1 and 2 could be considered as redundant.

Similarly, $\Pi_i^1, \Pi_i^2, \Pi_k^1, \Pi_k^2$ are not defined. I could infer from the text, but it could be worth to give the definition earlier. Moreover, please check the expression of Π_k^2 at pag.55: it seems to me that the last term should be $ec_k^2(z_{1k}, z_{2k})$ (or there is a missing parenthesis at the end of the expression).

Pag.57: two lines before the fifth centered equation, a typo: "marinal"->"marginal".

Pag.60: fourth line in subsection IV.I.II, a typo: "coallitions"-> "coalitions".

Pag.62: at the seventeenth line I imagine there is a typo, $\sum_{i=1}^{n} g_i < q \leq \sum_{i=1}^{n} g_i \rightarrow g_i < q \leq \sum_{i=1}^{n} g_i$.

Pag.62: in my opinion, an unambiguous definition of L is missing. This can lead to some misleading interpretations in the subsequent pages.

Pag.73: an interesting extension of the model with the exchange rate would be consider different exchange rates between the departing country, the rest of the world and the EU.

Pag.81: the last three lines seem to be a redundancy from the subsection explaining the basic notions of cooperative game theory.

Pag.85: perhaps, in a future work, it can be interesting to take into account the coalitions also based on the geographical criteria (i.e. North, Mediterranean, East, commonly observed in public debates)

Pag.87: the sentence before Table 3 reads:

"They do not have however enough power to win this kind of voting but they can block it together with countries reporting macroeconomic imbalances."

However, the subject "They" seems to refer to the countries with macroeconomic imbalances in the preceding sentence. If this is the case, the statement does not make sense. Please, revise.

Pag.89: in the fifth line of the "Summary" one reads "article". It should be amended.

Pagg.89-98: the Summary IV.III and the Conclusions V have some part of the text extremely similar and, therefore, it seems to read precisely the same thing twice in a small period of time. I imagine that one of the two sections (I would say the Conclusions) could be presented in a more synthetic way.

5. Final recommendation:

Mrs. Szczypińska dissertation has produced several interesting research outcomes and, therefore, it can be admitted to the final exam. As regards the next steps of the candidate's research activity, i.e. publications of papers from her dissertation, I believe that, after appropriate re-editing before whichever submission, two papers can be derived, one from the international oligopoly analysis and one from the voting power distribution analysis.

The dissertation constitutes a significant contribution to the research domain of Economics and Finance disciplines, therefore if fulfills the requirements of the Act on Scientific Degrees and Scientific Title and can be admitted as a PhD Thesis to public defense

X PhD thesis **is admitted** to the final exam.
☐ PhD thesis **is not admitted** to the final exam. It is recommended a deferral.

Significant additions / corrections requested:

None..

Reviewer: Domenico Buccella

Signature:

Date: 01 July, 2020