

REVIEW
of the official reviewer of the dissertation
«Asymptotic theory of regressions with asymptotically collinear
regressors» by Darkenbayeva Gulsim Spandiyarovna,
submitted for the degree of Doctor of Philosophy (PhD)
in the specialty «6D60100-Математика»

1. The relevance of the research topic and its relationship with general scientific and national programs.

The topic of the dissertation is related to L_p approximable sequences of regressions with slowly varying regressors.

Various types of regression with asymptotically collinear regressors are widely used, the study of the limiting behavior of which is provoked today by many causal factors, for example, in statistics and econometrics, as well as in the globalization of information data. At the same time, the asymptotic behavior of this type of regression is a more subtle characteristic. The topic of the dissertation remains relevant as a consequence of the practical significance of regression with asymptotically collinear regressors.

2. Scientific results and their validity.

In the dissertation considered a regression model which is determined by a slowly varying function and generalizing the stationary errors obtained earlier by Phillips in 2007.

The convergence of some quadratic forms which are used in the regression analysis was shown, as well as central limit theorems for linear and quadratic forms were obtained.

Several sequences have been added to the list of L_p -approximable sequences and she obtained theorem which generalizes K. Mynbaev's work on the convergence of quadratic forms for the case of asymmetric kernels.

For the main regression model integrated errors with non-causal linear processes are considered, and obtained useful results for unit root test problem the formulation of which was posed by Uematsu in 2011 and has remained open to the present.

3. The degree of validity and reliability of each scientific result, conclusions of the applicant, formulated in the dissertation.

The reliability and validity of the scientific provisions, conclusions and results of the dissertation is confirmed by the publication of the results in the highly-rated journal of Mathematical Analysis and Applications.

All the results obtained are new and based on own solution methods, consisting of the following:

1) convergence of some quadratic forms which used in the regression analysis is obtained.

2) central limit theorems for linear and quadratic forms are obtained.

3) several new sequences have been added to the list of Mynbaev's L_p -approximable sequences.

4) the Uematsu result on the asymptotic distribution of OLS estimators is proved under the less restrictive conditions.

5) Monte Carlo simulations were performed for the OLS estimators.

4. The degree of novelty of each scientific result, the conclusion of, the applicant, formulated in the thesis.

The novelty of the dissertation research includes the following points:

- A regression model with a slowly varying regressor in the presence of a unit root described;

- The introduced regression model has integrated errors with non-causal linear processes.

The results of Section 3 are carried out for non-causal linear processes and summarize some of Phillips and Solo's statements published in 1992.

The results of Section 4 summarize the theorems of K. Mynbaev published in 2001 on the convergence of quadratic forms for the case of asymmetric kernels.

Section 5 contains several new L_p -approximable sequences.

In Section 6 the applicant proved the Uematsu result on the asymptotic distribution of OLS estimators under the less restrictive conditions.

5. Practical and theoretical significance of scientific results.

The results of the study determine the method for solving the problem of the unit root test. It should also be noted that this work has many applications in econometrics and statistics, in other words, the results of the study are determined by the needs of practice.

6. Comments, suggestions for the dissertation.

I note some comments for the dissertation:

- The notation of vectors does not comply with the international mathematical standard.

- Sources of used literature do not contain references to publications of recent years.

- Intervals with formulas have offsets.

These shortcomings are easily removable, not related to the content of the thesis and do not reduce the quality of the thesis of Darkenbayeva G.S.

7. Compliance with the content of the thesis in the framework of the requirements of the Rules for the award of scientific degrees.

The noted shortcomings do not affect the high score of the dissertation. The dissertation abstract correctly reflects its content. The main results of the work are new and they are published in the following journals: - 1 in high indexed journal and - 4 in journals recommended by the Committee for Control in Education and Science of the Ministry of Education and Science of the Republic of Kazakhstan.

The dissertation work on theme «Asymptotic theory of regressions with asymptotically collinear regressors», by Darkenbayeva Gulsim Spandiyarovna, submitted for the degree of Doctor of Philosophy in the specialty “6D060100 - Mathematics” satisfies to all requirements of the rules of the Committee for control in the field of education and science of the Ministry of education and science of the Republic of Kazakhstan and its author – Darkenbayeva Gulsim Spandiyarovna deserves the award of the degree of Doctor of Philosophy (PhD).

Official reviewer

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