Report on **Master Thesis**

Institute of Economic Studies, Faculty of Social Sciences, Charles University

Student:	Bc. Yueyue Zhang
Advisor:	PhDr. Lenka Štastná, Ph.D.
Title of the thesis:	The Economic Impact of the COVID-19 Pandemic in Chinese Cities: What Can We Learn from the SARS Pandemic

OVERALL ASSESSMENT (provided in English, Czech, or Slovak):

Please provide a short summary of the thesis, your assessment of each of the four key categories, and an overall evaluation and suggested questions for the discussion. The minimum length of the report is 300 words.

Short summary

The title of the thesis promises a thesis that might try to use insight from the SARS epidemics to gain insight relevant for the analyses (or perhaps even predictions) of economic effects of the Covid-19 pandemics on Chinese cities. This sounds like a very interesting idea, but – as the author realized and shows in the thesis – an idea that would be also rather hard to implement because of:
1. Rather limited comparability of the two epidemics – especially of their extent, duration, timing (Spring Festival in China), effects on trade partners outside China….
2. A limited ability to control for numerous other influences that might be relevant for growth patterns of the analyzed variables (e.g. both the access to foreign markets and openness of Chinese economy were improving during the time of SARS epidemics thanks to the WTO accession, while Covid interacted with the period of increased Sino-US trade frictions (as the author correctly admits on p. 14). In fact, China has experienced so dramatic structural changes and changes in policy preferences of its leaders (compare e.g. Zhu Rongji positions in the late 1990s/early 2000s with current preferences of Xi Jinping/Li Keqiang) that one might wonder whether a relatively stable econometric specification should be used.

It seems that the author was quite well-aware of these issues and therefore resorted to a less ambitious objective – she constructs two panels that depict the growth performance (in terms of quarterly GDP or monthly import and export data) of selected cities in China and attempts to capture the effects of both Covid and SARS on growth of the variables.

Contribution
Three potential levels of the author's contribution can be identified:
1. She provides a literature review that attempts to map the effects of SARS and Covid-19 on Chinese economy.
2. Ms Zhang then attempts to obtain and present data on quarterly/monthly economic dynamics at regional (city) level.
3. Finally, she estimates several sets of growth regressions which include a relatively high number of interaction terms which in principle might promise an interesting insight into the logic of the effects of the epidemics.

Unfortunately, the first two levels of potential contributions are weaker than they might have been – as described in the next sections, the literature review might have included additional sources and the methods used to prepare the data might have had negative effects on the relevance and reliability of the data. Especially the latter issue has also negative implications for the third level of contributions – while the author evidently invested a lot of time into estimating and interpreting the growth regressions, the reliability of the results remains rather unclear (Ms Zhang can address this issue during the

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defence). However, I appreciate that the student attempted to create the otherwise difficult to obtain dataset.

Methods

The discussion of methodology must (at least in this case) start with the discussion of the methods used to construct the dataset. Unfortunately, city-level (as well as sufficiently detailed province-level data) are in many cases not readily available for Chinese economy. While this is not the author's fault and while it should be appreciated that she attempted to create such a dataset, some of the compromises might have gone a bit too far:

- **Growth rates of GDP in the cities**. The author describes this procedure in section 3 (p. 21-23) and in appendix B. If I understand the procedure correctly (Ms Zhang is asked to clarify this point), the author first calculates the quarterly provincial data from national-level quarterly dynamics and annual data on the provincial GDP. This interesting decision is most probably responsible for the dynamics apparent in Figure 7 (p. 24) and it would also mean that the quarterly dynamics analyzed by the subsequent econometrics is largely artificial. The author then continues – and obtained the levels of quarterly data for cities from the quarterly value of the GDP for the whole province by means of looking at a proportion of population of the province that resides in each analyzed city. This might look relatively innocuous (many applications of e.g. regional IO analysis use so-called location coefficients based on similar logic), but it is important to realize that even the cities in what probably should be the "base" category are still large provincial centers, typically regional capitals. For example, for Shandong province: Jinan (which the author simply describes as an "inland city" - p. 21) is in fact, the capital of the province with almost 6 mil. inhabitants (more if surrounding areas are included as the author did.). If this procedure was indeed used, the author very likely underestimates the levels of per capita GDP in such cities. Furthermore, one should expect that there will be significant structural differences between such cities and the rest of the province, some of which can be quite relevant for the effects of Covid. Interestingly enough, the regressions use information on the structure of output in the cities – I wonder how these were obtained (at a quarterly level of detail).
- **Export and import data.** The first issue with the data is similar. The source mentioned by the author (Chinese customs statistics) indeed provides data on regional exports and imports, but at least the sections which I have had a chance to access provide data again at provincial level (other similar sources that I have seen also provide provincial level data). Does it mean that a similar procedure was used to calculate e.g. Jinan's trade data out of provincial data and relative population? Secondly, the author also claims to have deflated export and import data with the use of CPI and deflator (p. 21). This is not quite correct - the composition of exports and imports differs significantly from the composition of GDP or of consumption basket (e.g. because of the role of non-tradables). Furthermore, it seems that the author actually uses only annual values of the deflators that she apparently intrapolates. And as she did not have deflators for 2021, she assumed zero inflation for this year. In fact, using original nominal data might have been preferable to this kind of treatment.

The regressions (the author provides the specification in section 4, p. 37) are similar to traditional growth (convergence) regressions with a relatively high number of additional variables and interaction terms. The author does not attempt to discuss any deeper foundations and their implications, but similar forms of specification are not unusual at this level. The author estimates the regressions by

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means of pooled OLS, fixed and random effects estimators respectively. She attempts to address possible issues related to heteroskedasticity, cross-sectional dependence and seriál correlation. She does not mention the presence of the dependencies and autocorrelation can be related to the methods used to create the dataset; instead she focuses on rather mechanical attempts to find estimators/specifications that promise to alleviate the problems. While I appreciate the time invested into this effort, I still believe that the results are likely to be severely impaired by the methods used to prepare the data. As far as the conclusions are concerned, some appear logical (e.g. greater sensitivity of coastal cities, the signs of some of the interaction terms); other can appear confusing or happen to be interpreted in a potentially misleading way, such as the rather strong conclusion that the "the cases in the last quarter can promote the economic development of the city" (p. 51).

Literature
As far as the length is concerned, the thesis includes an acceptable list of references. However, the literature discussed by the author misses:
- Some quite interesting papers which had been published recently and which analyzed regional development in China. Some of these are based on novel regional data too. Example: Fang et al. (2020): Pandemics, Global Supply Chains, and Local Labor Demand: Evidence from 100 Million Posted Jobs in China (NBER working papers).
- Attempts to analyze economic effects of anti-Covid measures with the focus on (global/local) supply chains, often with the use of input-output data and methods. Quite a few similar studies have been published and even if most focus on other countries, some of their implications might be relevant for the author's focus on the differences between e.g. coastal and other cities in China.

Manuscript form
The thesis includes a voluminous appendix which provides additional details on variables and data (A, B) as well as more detailed results of regressions and specification tests (C). Lists of tables and list of tables are provided too; tables and charts are mostly formatted in an acceptable way.
The structure of the references is a bit less perfect (e.g. the bibliography describes some sources very briefly), similarly the description of the sources of data in some charts is rather sketchy (e.g. Figure 4 on p. 13) simply mentions "github" as the source of data).

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Overall evaluation and suggested questions for the discussion during the defense

The results of the Urkund analysis (8% similarity score) do not indicate significant text similarity with other available sources.

In my view, the thesis fulfils the requirements for a bachelor thesis at IES, Faculty of Social Sciences, Charles University. Therefore, I recommend it for the defense and suggest a grade D.

Suggested questions for the defense:

Questions:
- Please explain whether the customs statistics provide access to city-level export and import data (e.g. for Jinan) or whether they had to be approximated.
- Please explain in detail the procedure that you have used to convert nominal data into real and to obtain quarterly growth data for the analyzed cities. Outline possible problems with this procedure and discuss whether the problems might have had any effects on your results.
- You repeatedly suggest (e.g. p. 64) that some of the effects might have been related to other countries' Covid-related tightening of import policies. Can you provide examples of similar cases?

SUMMARY OF POINTS AWARDED (for details, see below):

CATEGORY		POINTS
Contribution	*(max. 30 points)*	23
Methods	*(max. 30 points)*	17
Literature	*(max. 20 points)*	13
Manuscript Form	*(max. 20 points)*	17
TOTAL POINTS	*(max. 100 points)*	**70**
GRADE	**(A – B – C – D – E – F)**	**D**

NAME OF THE REFEREE: *Vilém Semerák*

DATE OF EVALUATION: *Digitally signed (January 24th, 2022)*
Vilém Semerák

_____
Referee Signature

EXPLANATION OF CATEGORIES AND SCALE:

CONTRIBUTION: *The author presents original ideas on the topic demonstrating critical thinking and ability to draw conclusions based on the knowledge of relevant theory and empirics. There is a distinct value added of the thesis.*

METHODS: *The tools used are relevant to the research question being investigated, and adequate to the author's level of studies. The thesis topic is comprehensively analyzed.*

LITERATURE REVIEW: *The thesis demonstrates author's full understanding and command of recent literature. The author quotes relevant literature in a proper way.*

MANUSCRIPT FORM: *The thesis is well structured. The student uses appropriate language and style, including academic format for graphs and tables. The text effectively refers to graphs and tables and disposes with a complete bibliography.*

Overall grading:

TOTAL	GRADE
91 – 100	A
81 - 90	B
71 - 80	C
61 – 70	D
51 – 60	E
0 – 50	F