Report on **Bachelor / Master Thesis**

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

Student:	**Bc. Martina Badáňová**
Advisor:	**PhDr. Ladislav Krištoufek, Ph.D.**
Title of the thesis:	**Forecasting in futures markets: Front, back and rolling contracts**

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

In the thesis, the author analyzes commodity futures prices (of front and back contracts, i.e., contracts with the nearest, and second nearest delivery, respectively) from various points of view. First, she aims to forecast back contract prices using the front contract prices by means of the error correction model. However, as the author did not find cointegrating relationships between the variables, this model is not fitted. Next, prices of roll contracts (i.e., the difference between prices of back and front contracts) are analyzed, while utilizing the long-memory property of the time series. Finally, the in/ability to forecast roll contract prices are explained by measures of liquidity of futures contracts. The results are contrasted with predictions the Fractal Market Hypothesis (FMH).

The thesis is written well and provides a nice introduction to the FMH and models of time series with long memory. The author has shown that she mastered advanced econometric techniques (cointegration, ARFIMA models) and gained thorough understanding of futures markets. Therefore, **I suggest a 1 grade**.

There are several points which could have been improved upon:

- I think the motivation could have been a bit more elaborated: why would one want to forecast back contract prices using front contract prices? (I thought they are both known at the same time). To identify some mispricing? In that case, wouldn't one want to include more inputs, such as the spot price, interest rates, costs of carry, time to delivery date, as the theory recommends?
- Regarding the methodology, it seems a bit limiting to assume a linear and stable cointegrating relationship between variables over the whole sample. For example, it means that we assume that the futures curve is upward or downward sloping on average. But this is probably not the case, since backwardation / contango can switch relatively frequently. Couldn't this affect the results of cointegration tests?
- It would be interesting to see a few plots of how roll contract prices evolve over time. I believe that if a commodity has one delivery day a month and the market for its futures is relatively illiquid, the roll contract would have jumps around the date of delivery, because the contracts immediately shift by one month. Also, some descriptive statistics could have been included (e.g. the proportion of positive / negative values of roll contracts to see how often the futures curve is upward / downward sloping).
- There are several statements which are a bit questionable, for example:
    - p. 25: …"back futures should cost little more because of higher *risk premium* and positive storage cost" – I though that if an asset is risky, its price should be lower with respect to other assets
    - If I understand it correctly, the main conclusion of the thesis is that if the market is not liquid, prices are not predictable. This should support the FMH which states that when the markets are not liquid, people will accept unfair

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prices (Section 4.5, the last paragraph on p. 49). This may be true, but the reasoning implicitly assumes that fair prices are predictable using past prices only. Isn't this assumption a bit strong? In fact, this would be in contrast with the semi-strong and strong forms of the EMH. But I may be wrong, since I am not familiar with the FMH.

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

CATEGORY		POINTS
Literature	*(max. 20 points)*	20
Methods	*(max. 30 points)*	25
Contribution	*(max. 30 points)*	25
Manuscript Form	*(max. 20 points)*	20
TOTAL POINTS	*(max. 100 points)*	**90**
GRADE	**(1 – 2 – 3 – 4)**	**1**

NAME OF THE REFEREE: Tomáš Adam

DATE OF EVALUATION: 15 June 2015

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Referee Signature

EXPLANATION OF CATEGORIES AND SCALE:

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

Strong	*Average*	*Weak*
20	*10*	*0*

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.*

Strong	*Average*	*Weak*
30	*15*	*0*

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.*

Strong	*Average*	*Weak*
30	*15*	*0*

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.*

Strong	*Average*	*Weak*
20	*10*	*0*

Overall grading:

TOTAL POINTS	GRADE		
81 – 100	**1**	= excellent	= výborně
61 – 80	**2**	= good	= velmi dobře
41 – 60	**3**	= satisfactory	= dobře
0 – 40	**4**	= fail	= nedoporučuji k obhajobě