

PhD Thesis

DOROTA KOWALCZYK

Referee Report

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I have been asked to review 3 papers by Mrs. Dorota Kowalczyk that will be a part of her PhD thesis to be defended at CERGE. The papers are:

1. Capital, Liquidity and Risk Allocation in the Banking Euro-Zone Sector,
2. Monetary Conditions and Banks' Behaviour in the Czech Republic,
3. Evaluation of Swap Contracts Using Various Term Structure Models.

In my opinion, this order corresponds to the author's contribution towards her PhD thesis of the respective papers.

The first paper, Capital, Liquidity and Risk Allocation in the Banking Euro-Zone Sector investigates the capital, risk and liquidity decisions of the European banks in the period from 2001 to 2007 using the system of simultaneous equations. The novel contribution here is that the paper studies these variables (liquidity, capital and risk decisions) jointly. The results support previously found simultaneity of capital and risk decisions and they suggest a coordination of risk and liquidity decisions. At the same time, there is no evidence of the direct coordination of capital and liquidity. The empirical strategy relies on the dynamic panel estimation. One of the major

conclusions is that the higher risk in the previous period implies greater securitization in the next period.

I believe that this is a potentially interesting paper that can be published in a decent journal, the method seems to be correct and the conclusions seem to be relevant for the field. At the same time, the paper needs to be polished, for instance the abstract and the conclusion repeat the same sentences, suggesting that the conclusion should be either substantially reformulated or completely removed. A natural question would be to use more recent data, not just the set that ends in 2007, which is six years ago. An extra attention should be paid to the fact that the paper does not confirm results from the existing literature, namely the paper by Repullo (2005). Unfortunately, the abstract and the conclusion does not say what exactly is not confirmed as this is one of the major points. I expect that the Repullo's conclusion that the higher capital implies lower risk is not supported by this paper that finds that the higher capital implies higher risk. Why the two conclusions are different must be discussed in detail, maybe the methodology of one of the paper is not correct (in particular, it puts the results of the present paper in question). At this point, it remains unclear and the paper should justify it beyond any doubt.

The contribution of the second paper, Monetary Conditions and Banks' Behaviour in the Czech Republic, is somewhat discounted by the fact that it is a joint work of 5 coauthors. In such cases, the exact role of the PhD candidate on the specific project should be clarified. This paper itself examines the impact of monetary conditions on the risk-taking behaviour of banks in the Czech Republic by analysing the comprehensive credit register of the Czech National Bank. The existing literature suggests that higher tolerance to risk implies that at times of low interest rates banks will seek to finance riskier borrowers. The present study also suggests that the Czech banks are somewhat more conservative and that the larger and more liquid banks tend to extend fewer loans to firms with a recent bad credit history. Additionally, banks with a worse relative credit risk track record tend to finance fewer companies with a riskier past. The study also finds that less leveraged banks are less likely to incur credit risk.

This (second) paper is more in line with the existing literature, the novel contribution is that it studies a unique set of the Czech data. As such, the paper has a more limited audience than the first paper and it probably can be published in a journal with a regional impact.

The third paper, Evaluation of Swap Contracts Using Various Term Structure Models, compares fitting several term structure models to the Polish interbank data. The term structure models include Nelson and Siegel (1987), Vasicek (1977), Cox,

Ingersoll and Ross (1985), Heath et al. (1992) and the cubic spline curves. The paper concludes that the model of Nelson and Siegel or the cubic spline curves have the best predictive ability.

I do have some reservations regarding this paper. The theoretical part of the paper just states existing and well known results, sometimes with typographic errors (like equation (11) where the term $\sqrt{r(t)}$ is missing in front of the $dW(t)$), the novel part is just the fit to the particular set of the data. However, my largest reservation is towards the methodology used in this paper. It is well known that the Heath-Jarrow-Morton (HJM) model is the general no arbitrage model of the evolution of the forward curve and all the other models are just special cases of this model for a specific choice of the volatility surface. Thus the conclusion that the HJM model does not perform well while CIR model (a submodel of HJM) does a good job is just simply wrong, a submodel cannot obviously overperform a general model. The author only chose a special submodel of HJM and compared it with CIR and concluded that one special submodel seems to be better than another special submodel.

Although the conclusion can be fixed and the paper can be improved, it certainly raises a big question mark whether this project has been done carefully from the start. Perhaps a better choice of the volatility surface in the original HJM model can lead to even more superior results than presented in the paper, it is certainly expected that such a model would ultimately outperform the short rate models such as the CIR. There have been some rather successful attempts to build Markov models of the yield curve using the HJM methodology (for instance Brace, A., and M. Musiela (1994): "A multifactor Gauss Markov implementation of Heath, Jarrow, and Morton." *Mathematical Finance*, (4)3, 259-283 and the follow up work) that is not fully reflected in the present paper.

In conclusion, my opinion is that the paper *Capital, Liquidity and Risk Allocation in the Banking Euro-Zone Sector* brings the largest novel contribution to the field and this work should be counted most towards the PhD thesis. The results seem to be interesting and the work has a potentially global impact as it is not limited to the Czech or any other locally restricted data. The question there is whether the challenge of the existing literature (Repullo (2005)) would stand a more detailed scrutiny. This could be judged more competently by people who have done some follow up work in that direction. The second paper, *Monetary Conditions and Banks' Behaviour in the Czech Republic*, is probably publishable in a decent local journal. The contribution of the PhD candidate towards that paper should be clarified. The last paper, *Evaluation of Swap Contracts Using Various Term Structure Models*, needs significant improvement before it can be considered to be sent out

for a publication, the term structure models studied there are chosen ad hoc in the situation when the best fit can be obtained using more rigorous and already existing procedures from a larger class of models.

My recommendation is that if the conclusions of the first paper are correct, this can be used as a basis of a justification of awarding the PhD degree. The second paper is discounted by 5 coauthors, so the contribution is not clear. The third paper needs to be redone along the above mentioned lines.