

Opponent's Report on Dissertation Thesis

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Title of the Thesis:	Asset prices and macroeconomics: towards a unified macro-finance framework
Type of Defense:	DEFENSE
Date of Pre-Defense	March 4, 2020
Opponent:	Doc. Mgr. Tomáš Holub Ph.D.

Address the following questions in your report, please:

- a) Can you recognize an original contribution of the author?
- b) Is the thesis based on relevant references?
- c) Is the thesis defensible at your home institution or another respected institution where you gave lectures?
- d) Do the results of the thesis allow their publication in a respected economic journal?
- e) Are there any additional major comments on what should be improved?
- f) What is your overall assessment of the thesis? (a) I recommend the thesis for defense without substantial changes, (b) the thesis can be defended after revision indicated in my comments, (c) not-defensible in this form.

(Note: The report should be at least 2 pages long.)

I provided detailed comments (5 pages) to the pre-defense version of the dissertation. Already in that review I concluded that the thesis contains important original contributions in several areas: (i) interactions between fiscal policy, macroeconomic developments and government bond pricing (mainly Chapters 3); (ii) fiscal multipliers and the dependence of their size on the ZLB situations in combination with flattening of the Phillips curve (Chapter 4); (iii) highlighting modelling problems that may arise in DSGE models due to the assumption of Calvo pricing in the presence of trend inflation, and proposing their solution (Chapter 2).

I also expressed my belief that the thesis could be brought to a successful formal defense quickly after some revisions indicated in my comments. In this official review I thus focus on assessing the way in which the author has reflected on these earlier comments.

Chapter 2

- The author has amended the introduction of this chapter to better clarify the relationship between the general methodological (modelling) contributions of his research and the bond-pricing literature within a DSGE framework. The change is not big compared to the pre-defense version, but addresses my comments.

- Small formal errors and omissions have been corrected, making the chapter easier to read.

- The negative inflation means in some of the model specifications have been explained in the response to my comments on page 201.
- My remark that in reality the economic agents wouldn't probably use a non-indexation version of Calvo pricing in the presence of trend inflation, as this would imply high real costs for them, is discussed by the author on page 202 (he essentially agrees with that).
- The author has clarified on pages 29-30 that "In the economy with trend inflation and Calvo contracts firms which cannot change its price produce more output than it is optimal under the flexible prices." This fully addresses my earlier comment.

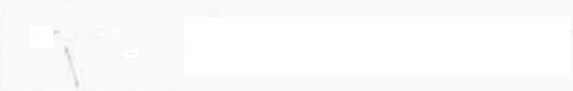
Chapter 3

- The author has spelled out explicitly in the introduction that his conclusion about the impact of higher uncertainty regarding certain types of government spending in terms of pushing the government bond yield curve lower is conditional on the assumption of no sovereign default risk. This reflects my earlier recommendation.
- A newly added footnote 3 addresses my comment that the author should be explicit at the very beginning of Chapter 3 about his choice of zero steady-state inflation for this particular chapter (as opposed to Chapter 2)..
- The chapter is now clearly finished in terms of detailed comments on Tables 3.3 and 3.4 and a short concluding section.
- The confusing typos from the pre-defense version have been corrected.
- Several of my remarks and questions (e.g. the use of nominal government bonds as the only consumption-smoothing asset, time-varying elasticity of substitution and inflation target) are being discussed by the author in response to my comments on pages 203-204.

Chapter 4

- The definition of variables has been extended, in line with my recommendation.
- There is a brief discussion of possible inclusion of non-Ricardian households on page 171.
- On pages 206-207, the author responds to my comments and question concerning the link between the Phillips curve slope and fiscal multipliers in the (non-)ZLB situations.

Overall, I thus conclude that the author has addressed my comments in a fully satisfactory way. The thesis has a very high quality and I recommend it to be defended with no further changes.

Date:	6 May 2020
Opponent's Signature:	
Opponent's Affiliation:	Doc. Mgr. Tomáš Holub Ph.D. IES

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Ad a)

The thesis definitely contains original contributions in the areas of:

(i) Interactions between fiscal policy, macroeconomic developments and government bond pricing (mainly Chapters 3). It addresses important macro-finance issues such as the “bond premium puzzle” (which seems to be less of an issue empirically in recent years, but may resurface if the world returns back to “normal”) and the impact of government spending shocks and their variability on the bond yields. It thus brings important insights both for macroeconomists, as well as for the financial industry.

(ii) Fiscal multipliers and the dependence of their size on the ZLB situations in combination with flattening of the Phillips curve (Chapter 4). This topic is highly relevant as the frequency of ZLB episodes is likely to be higher than in the past and the issue of flatter Phillips curve has been discussed extensively in recent years. I see the main methodological advantage and contribution of this chapter in the fact that flatter Phillips curve is not modelled by an ad hoc increase in price rigidities (Calvo parameter), but endogenously as a consequence of strategic

complementarity in the price setting. This chapter is the one that I personally like most, as it is closest to my own area of interest and expertise.

(iii) As a by-product, the thesis highlights problems that may arise in DSGE models due to the assumption of Calvo pricing in the presence of trend inflation (Chapter 2). It shows that adding inflation indexation or switching to Rotemberg pricing may be a better modelling strategy.

I also appreciate the thesis' introduction provided in Chapter 1, which nicely summarizes its findings. It is well written and relatively easy to understand even for someone not very familiar with this stream of research.

Ad b)

Yes, the thesis contains relevant references, which include seminal papers, as well as very recent pieces of the literature. It demonstrates the fact that the author is moving at the frontier of research.

Ad c)

After some modifications, the thesis will clearly meet the high standard of the IES FSV UK. The three papers would also be defensible as working papers at the Czech National Bank (the review process of which is comparable to academic journals).

Ad d)

Chapter 4 has been already published in the Journal of Macroeconomics. The other two chapters have been published as NBS working papers and definitely have a further publication potential. As regards Chapter 2, I think the author would need to redraft the text in either of the two directions: (i) Skip the original motivation of exploring bond pricing in the DSGE set-up, focus on the methodological issues associated with trend inflation under alternative specifications of price rigidities, and try to publish in a journal focused on macro-modelling; (ii) De-emphasize the above methodological / modelling issues, choose the specification of price rigidities that can cope with trend inflation, explore the bond pricing topic and then try to publish in a journal focused on macro-finance research. In the current version, the chapter stays half-way between the two options, which could make finding an appropriate outlet difficult.

Ad e)

Chapter 2

- It is quite obvious from the text that the author achieved something else compared to his original objective. In the end there is very little about the bond pricing and term premium. Instead, it is a macro-modelling methodological paper. I would suggest redrafting along one of the two options mention above (with the former one being clearly easier, which would allow bringing the thesis to formal defense soon).

- Page 17: Footnote 1 refers to Figure 4.1., which is not provided. Later on, the references to Tables and Figures give wrong numbers. The definition of variables reported in Table 2.1. on

page 24 is missing. These formal errors and omissions need to be corrected to make the chapter readable.

- What is the reason for negative (sometimes very negative) inflation means in some of the model specifications? Some discussion of this outcome in the text would be welcome.

- Page 18: It is correctly stated in footnote 5 that the Calvo pricing mechanism is not considered to be the most realistic set up. It is also true that, nonetheless, it is the most widely used device to introduce nominal rigidities into DSGE models. However, many of the applied models that I know from the macroeconomic profession (such as the models to support inflation targeting frameworks) use Calvo pricing with inflation indexation. In reality, it seems implausible that the economic agents would stick with a non-indexation version of Calvo pricing in the presence of trend inflation, as this would imply real costs for them well in excess of any plausible menu costs. There should be some discussion of this in the text, as the author himself concludes that adding inflation indexation into the Calvo pricing set-up largely solves the problem that he identifies as the main conclusion of this chapter.

- Page 25: The author states that “The economy with trend inflation and Calvo contracts produces more output than optimal.” I am not sure relative to what “optimality” benchmark this holds. Is it relative to the steady state of an economy with monopolistic competition, Calvo pricing and no trend inflation? But monopolistic competition leads to a steady state output which is below the Pareto efficient level. The word “optimal” may not be appropriate here. Or is it relative to an economy with perfect competition and no nominal rigidities?

- Page 31? There is a small typo “firmsŠ”.

Chapter 3

- The conclusion that higher uncertainty about certain types of government spending may push the government bond yield curve lower is very interesting. But it may be highly conditional on the assumption of no sovereign default risk. This fact is only briefly mentioned on page 87. In practice, when there are sovereign solvency issues, more uncertainty about government spending plans may actually shift the yield curve up, as has recently been demonstrated nicely by the Italian case. I think this disclaimer should be clearly spelled out in the introduction, as well as conclusions of Chapter 3 (and in the relevant parts of summary Chapter 1).

- If I understand the paper correctly, the government bonds are assumed to be nominal, not real. At the same time, they are by assumption the only asset that can be used by the model households as a store of value and as a hedge against various macroeconomic shocks. These modelling choices should be spelled out explicitly and explained in more detail at the beginning of the chapter, as especially the latter one seems to be far from reality.

- Given how much effort is spent in Chapter 2 arguing that trend inflation should be a part of any model trying to explain government bond pricing, the author should be explicit at the very beginning of Chapter 3 about his choice of zero steady-state inflation. In the current version of the text, the reader first notices it on page 69 in Table 3.1.

- Page 57: Section 3.3. is missing in the outline of the paper.

- Page 59: It is a bit awkward notation to use the λ_t symbol both for the Lagrange multiplier in the household consumption choice as well as a parameter in the firms' production function. I also find it strange to write the latter as a time-dependent variable. I understand that in the end the firms' mark-up is time-varying due to nominal rigidities; but this does not mean that the same is true for the technological parameter.

- Page 61: I would call section 3.2.3 "Government and Monetary Policy", as the central bank is typically institutionally separated from the government.

- Page 61: Why is the inflation target defined as time-varying in equation (3.18)? Does it have any implications for the paper's conclusions? Some discussion of this would be welcome.

- Page 69: It is the first (and may be also the last?) place where Rottember pricing is mentioned in the chapter. Is it needed at all?

- Page 83: I do not understand the sentence: "Higher inflation undermines the real value of bonds exactly in time of lower inflation." Some clarification would be welcome.

- Page 87 (and subsequent pages): Is the reference to figure 3.11. correct? Shouldn't the text refer to figure 3.8 instead? In general, the author should guide the reader a little bit more in terms of how to interpret the results presented in figures 3.8., 3.9 and 3.11. If I understand it correctly, some conclusions are drawn by comparing the yield curves' levels and slopes in different figures, but this is not explained very well verbally. Moreover, if this is the case, the vertical scale of all the 3 graphs should be the same to allow for an easy visual comparison.

- Page 90: I am confused by the sentence: "If the weight on inflation is zero in the monetary policy rule bonds can protect its holders against the fluctuations in their wealth due to productive government spending." Zero weight of inflation in the Taylor rule should in general lead to the price-level indeterminacy issue. Such an environment would make nominal bonds a very risky investment vehicle in terms of – basically unpredictable – real return. Some further discussion of this conclusion might thus be appropriate.

Page 95: The chapter seems unfinished. There is no comment on Tables 3.3 and 3.4 and no concluding section of the whole chapter.

Chapter 4

- In my opinion, it should be spelled out more clearly that the conclusions apply to a model with strong Ricardian features, and some of them may thus not hold universally. For example on page 161, it is stated that the demand for labour is not affected by a cut in labour tax rate. Would this hold in an OLG model, or a model with some share of hand-to-mouth consumers (see the discussion on page 167)?

- In a static model, a flatter Phillips curve should imply that a larger portion of any given shift in the aggregate demand goes into real output and a smaller portion goes to prices. The beauty of the DSGE set up is that it is not static, and the size of the aggregate demand shift depends on the circumstances. If the economy is outside the ZLB situation and monetary policy response leads to the traditional crowding-out effect, the above intuitive conclusion from a

static model should be reinforced further. In this regard, the differences between fiscal multipliers for non-ZLB situations depending on the PC's slope look actually too small for me, and I would welcome some further discussion of this outcome. In the ZLB case, there is actually a dynamic crowding-in effect going through higher expected inflation and lower real interest rate. It is clear that this increases the fiscal multipliers compared to a normal situation for any give shape of the Phillips curve (and it is no surprise that the multipliers often exceed 1). Whether this intertemporal crowding-in ZLB effect implies a bigger fiscal multiplier with a steeper rather than flatter Phillips curve is likely to be an empirical issue, though. I would welcome some robustness checks e.g. with respect to: (i) the intertemporal elasticity of substitution of optimizing households; (ii) the share of hand-to-mouth consumers if included into the model; (iii) the degree to which the households are able to form rational expectations. Such robustness checks may actually bring more insight than the provided robustness check with respect to the model's non-linearities.

- Page 151 (and subsequent pages): The algebra of the model is presented without any definition of the symbols that are being used (which are mostly standard, but some are not self-explanatory).

Ad f)

The thesis can be defended after revision indicated in my comments. I assume that their incorporation will not take much time, and that the final outcome will be a high-quality dissertation.

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