Comments on "Monetary Policy and the Equity Premium"

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Overview

- The paper "Monetary Policy and the Equity Premium" falls into a broad class of research that addresses the failure of benchmark representative agent models to jointly capture the behavior of asset prices and economic quantities.
- Attempts to explain features such as the equity premium, the positive comovement of exchange rates and interest rate differentials across countries, as well as the low value of the risk free interest rate have proceeded along a number of lines.
  - One avenue has been to reexamine the specification of preferences.
  - Another, complementary avenue has been to segment markets, both exogenously and endogenously, so that the volatility of consumption of participants in asset markets is higher than that of average consumption.

- The current paper falls into this class of models
  - It investigates the effects that monetary policy has on stock prices, the equity premium, and the liquidity effect and produces a model that simultaneously is able to fit the empirical evidence on all three.
- The model and its solution represent a very interesting and sophisticated accomplishment.

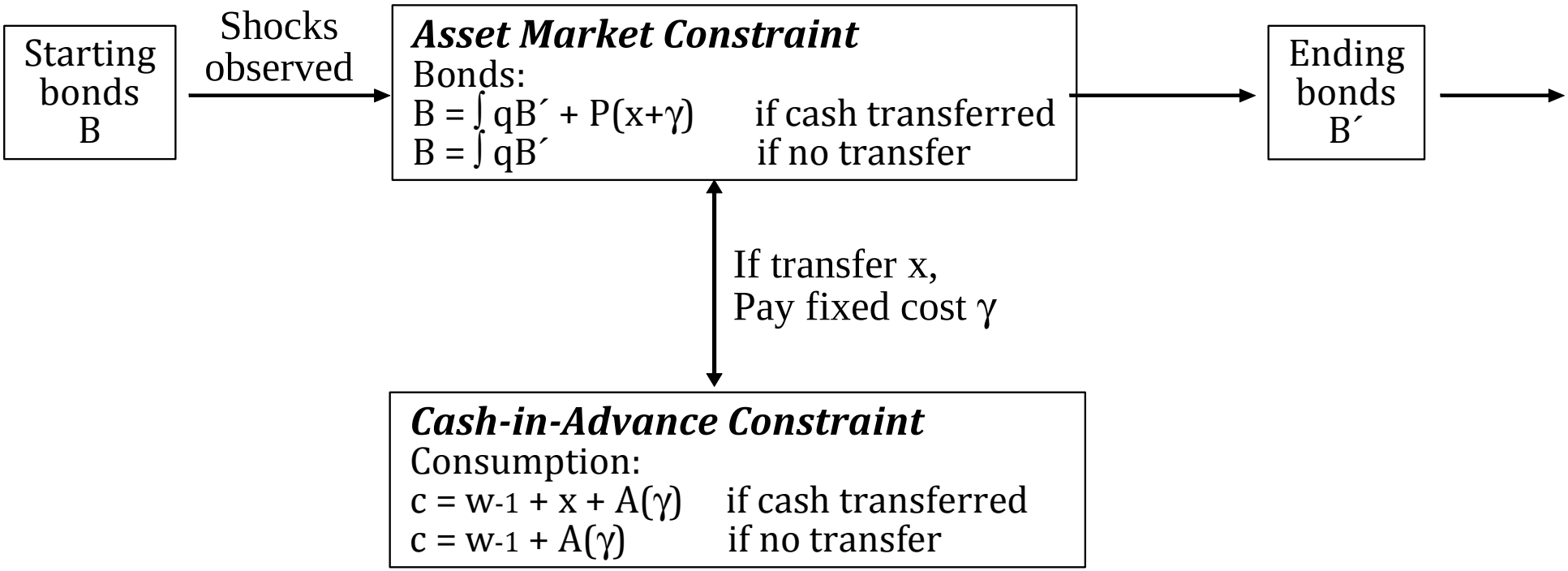
The Model

- The model is state dependent and most closely related to recent work by Alvarez, Atkenson, and Kehoe (2008).
  - Along this dimension, it is also related to the work of Khan and Thomas (2007), which I will return to at the end of my talk.
- State dependence gives rise to a changing fraction of households who actively participate in financial markets allowing the model to produce time varying risk premia.
- Specifically, the author's wish to construct a model in which shocks to monetary policy influence stock prices through both a change in the interest rate and the equity premia.
  - They wish to explain the empirical results of Bernanke and Kuttner (2005).
  - Time variation in the equity premium appears to be important in replicating this result, but more clarity would be useful in making sure this is indeed the case.

- Agents start off drawing a permanent fixed cost, γ, of using the asset market.
  - This fixed cost is the only source of heterogeneity and indexes agents.
- Agents use an initial endowment to purchase an annuity, $A(\gamma)$ and a porfolio of state contingent bonds.
  - In each subsequent period, the annuity directly deposits its returns into the agents transactions account.
- At the beginning of subsequent periods, agents will optimally choose whether to rebalance their portfolios and transfer money between the asset market and the goods market.
- Agents who do not choose to visit the asset market have funds equal to their annuity payment and last period's wages for purchases in the goods market.

Timing in the Two Markets

Initially $\bar{B}(\gamma) = \int qB_1 + P_A A(\gamma)$



- An important assumption of the model is that agents must spend all their money in the goods market.
  - The authors present a proof in the appendix that agents would never want to leave the goods market with unspent money balances.
  - I found this a bit unclear, and conjecture that the result is sensitive to assumptions about the underlying driving processes in the model.
  - For example, if wages were temporarily very high last period implying a large money balance for inactive agents, some might prefer the interest opportunity cost of smoothing consumption over a high cost of making two financial transactions, one to deposit the money today and the second upon withdrawing it later.

The Annuity

- The usefulness of the annuity in helping the model generate the desired results is emphasized in the paper.
- Basically, the annuities provide an avenue for smoothing consumption of inactive agents making financial market participation less desirable.
- Therefore, fairly low transactions costs can generate sufficient segmentation.
- The fraction of active agents cannot be too big or equity premia will be too small, nor too small or equtiy premia will be too big.
  - Essentially active agents are short the low risk asset (the annuity) and leveraged in the risky asset.
  - Their consumption stream is therefore quite volatile – 4 times that of innactive agents. Hence the EP.

- However, it appears that there could be an entire menu of bounds on annuity holdings and distributions of transaction costs that would produce essentially the same degree of segmentation.
  - Their criticism of the Alvarez, Atkeson, and Kehoe (2008) specification seems a bit unfair.
  - Relaxing the assumption that no money can be stored in transactions accounts in the AAK framework should similarly result in a lower desirability of using asset markets and hence imply a lower fixed costs for a given degree of desired segmentation.

- What are these annuitites and where are they observed in actual economies?
  - They could be thought of as an approximation to a portfolio of overlapping long term bonds that would yield a fairly constant return.
  - But, the amount that agents would have to be endowed with to allow the degree of consumption smoothing of inactive agents seems implausibly large.
  - A more rigorous calibration seems to called for.–perhaps incorporating asset and income distributions.

- The annuities could also, in part, represent a stream of government transfer payments due to social insurance or government provided services.
  - Along these lines the proportion of active agents and the depth of financial markets, would be influenced by public policies.
  - Other policies that make wages less volatile – or the degree of implicit contracting in labor markets – should also influence the extent of financial market participation.
  - Thus, the author's model potentially can generate a set of interesting cross country implications regarding the use of asset markets.

Some Intuition

- The basic mechanism for producing the equity premium is to create a volatile pricing kernel.
- The segmented markets methodology is capable of doing this by generating volatile consumption streams of agents who are currently active in financial markets.
- As mentioned, the requisite volatility occurs in this model because agents in the asset market are highly levered.
- Therefore, the underlying volatility in aggregate economic activity is magnified in their portfolios and returns on the risky assets must be sufficiently high for agents to participate in the equity market.

- If agents are very risk averse, a relatively small fraction will participate in the asset market and the combination of high risk aversion and greater leverage will result in a high return on equity.
- If they are not very risk averse or if transaction costs are fairly low, a large fraction of agents will participate, they will be less levered as well as less averse to risk and the equity premium will be fairly low.
- So parameter settings that induce more participation yield less volatility in the consumption of financial market participants and lower returns on equity.
  - This, in part, is the message of figure 1 in the paper, which provides a lot of insight.
  - It is not the full story, as I am unsure why the risk free rate falls with increased risk aversion as the intertemporal elasticity of substitution is also falling. I would benefit from additional clarification here.
- Because the equity premium varies with the degree of financial market participation, and that degree varies with aggregate disturbances, the equity premium is time varying in this model.

Problems

- In this model, the consumption of active agents is four times more volatile than that of inactive agents. Is that reasonable?
  - One might associate active agents with wealthier and more financially sophisticated individuals.
  - There is some evidence that wealthier individuals have more volatile consumption at least with respect to aggregate shocks.
- But it is the variability in marginal utility that is important. Bill Gates verse Mike Dotsey.
- Transaction costs still appear fairly large.

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- I translate the mean fixed cost as 6.67 hours of time to get additional money balances (OK by Vissing-Jorgenson (2002) calculations).
  - With their log normal specification it appears that a sizeable fraction of agents face significantly higher costs as well.
  - While that amount of time seems fairly reasonable, perhaps even small, for making decisions concerning asset allocations in a 401k plan, it appears counterfactually large for obtaining additional transaction balances.
- The size of transaction costs appears to be the achilles heal of segmented markets models.

The Bernanke-Kuttner Results

- Regarding an unanticipated positive monetary disturbance the consumption of inactive agents falls – they have less real balances due to the increase in prices.
- The consumption of active agents increases because they get all of the monetary transfer.
- Without an increase in participation, it appears that the equity premium would increase, because the consumption of active agents would be more volatile.
  - So it appears that state dependence and a time varying equity premium is important.

- A potentially interesting exercise would be to hold the participation fraction fixed, and calculate what happens to the equity premium.
  - This would help give a sense of the importance of time variation in the fraction of agents who transact in asset markets.
  - It would also be of interest to know how much of the equity premium is accounted for by money disturbances as opposed to technology shocks.
- Finally, it may also be useful to investigate if an interest rate instrument would change the quantitative results of the exercise.
  - I think there is reason to believe that it would – it would ameliorate the change in the price level and hence the desire to participate.

Robustness: The Model of Khan and Thomas

- Also state-dependent, but works a bit differently.
- Agents may carry transaction balances from goods market to goods market.
- There are no annuities and less risk shifting.
- Active agent's consumption has greater volatility than inactive agent's, because active agents get to reoptimize.
- In the nonstochastic steady state, the time spent away from the asset market balances transaction and opportunity costs.
- Does perturbing the segmented market framework make a big difference?
  - For similar parameter settings the KT framework generates an equity premium, but it is only about 1/5 of GL and thus 1/5 of what is in the data.
  - Some other features are qualitatively different – higher risk aversion leads to more frequent use of the asset market.

Abbreviated Description

- A continuum of agents belong to a household.
  - Representatives of the household after obtaining money go shopping, spend money, and consume.
  - The shopper receives a portion of the sales of last period's endowment free of any transaction cost.
  - Absent, going to the bond market, the agent must make do with his remaining money balances in next period's shopping.
  - Thus, the cash in advance constraint that each agent faces when going to the goods market depends on how long ago he last visited the bond market.
  - Also, because the transaction costs of going to the bond market are iid, everyone in the bond market at time t has an identical future and thus purchases the same amount of money balances, denoted as M_{0t}.

- Evolution of money balances.
  - Each agent brings some leftover money balances to the goods markets and has them augmented by a portion of last period's sales.
  - The shopper decides how much to consume, and then with the exception of a type J -1 shopper, exits with some money balances.
  - The shopper is aware that next period he will obtain some portion of this periods sales to spend. .

Financial Decisions

- Agent's draw a cost of going to the bond market,ξ, from the distribution $H(\xi)$.
- Those drawing a cost less than some cutoff value ξ^*, will replenish their money balances.
- Thus, for an agent who last visited the money market j periods ago, the cutoff is given by $\xi^*_{j,t}$.
  - The probability that he will be active in financial markets is $\alpha_{jt} = H^{-1}(\xi^*_{j,t})$.
  - The fraction of individuals who were last financially active j periods ago as $\theta_{j.t}$.
  - Thus, the fraction of individuals who are active today is $\theta_{1,t+1} = \sum_{j=1}^{J} \alpha_{jt}\theta_{jt}$
  - The transition of individual types who were inactive in the current period to next period is given by

$$\theta_{j+1,t+1} = (1 - \alpha_{j,t})\theta_{j,t} \text{ for } j = 1 \text{ to } J - 1 \qquad (1)$$

Household Problem

- The household chooses consumption and money holdings for each type of agent as well as whether that agent goes to the asset market.
- The household also chooses assets.
- The household budget constraint:

$$B_t \leq R_{t-1}B_{t-1} + P_t(1-\phi)y_{t-1} + T_t - \sum_{j=0}^{J-1} \alpha_{jt}\theta_{j,t}(M_{0,t} - M_{j,t}) \quad (2)$$

$$-\theta_{J,t}(M_{0,t} - \phi y_t) - P_t \sum_{j=1}^{J} \theta_{jt}\Xi_{j,t},$$

Calibration

- The model is an endowment economy.
- In an attempt to be consistent with the the large amount of funds that HH bring to the goods market, I set the fraction, $\phi = .9$.
- I use a monthly parameterization, set $\sigma = 3$, and the maximal amount of fixed cost at .025 of the endowment.
  - This corresponds to about 2.67 hours for a transaction.

- For this parameterization, no agent stays away from the asset market for more than 3 periods.
  - 1/3 of agents are active.
- The quantities of the economy are calculated via a first order linear approximation.
- The asset prices and the unconditional equity premia are calculated nonlinearly using the policy functions for quantities.
- The formula used is that of Jermann (1998) $E(R^e_{t+1})/R^f_t = cov(\lambda_{t+1}, R^e_{t+1})$ where λ is the marginal utility of active agents.
- I get an equity premium of 1.3%, which is much larger than the few basis points one gets without segmented markets.
- It is, however, only 1/5 the size of that obtained by GL-S.

- Additionally, I lowered the value of sigma to 1, and now some agents wait 8 periods before going to the asset market.
  - Only 15% are active.
- The equity premium is only 25 basis points.

Concluding Comments

- So it appears the segmented markets framework of GL-S may be a more desirable strategy for generating premia.
- However, it also appears to me that the AK framework is more relevant for monetary issues.
  - Almost everyone in the economy alters transaction balances frequently.
  - But few of us make active portfolio reallocations.
  - And as Vissing-Jorgenson (2002) points out there is significant turnover of participants.
- It, therefore, seems to me that both types of margins are important and maybe should be analyzed seperately.

- Again I wish to reiterate that the paper represents a sophisitcated and interesting analysis of the interaction of financial market segmentation and monetary policy.
- I learned a lot from reading the paper.
- I think it will represent a benchmark as we move to ever more sophisticated treatments of these issues.

KT model sigma = 1

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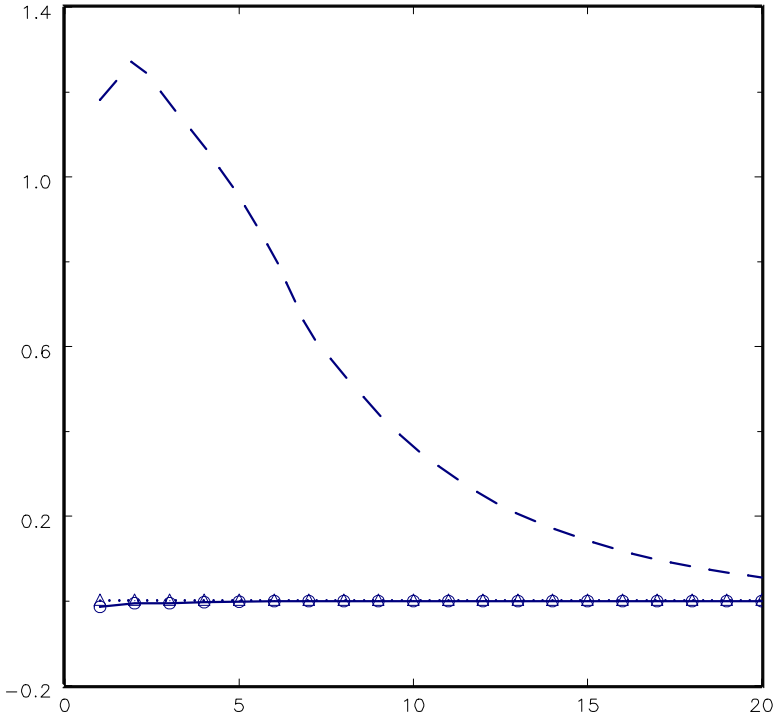
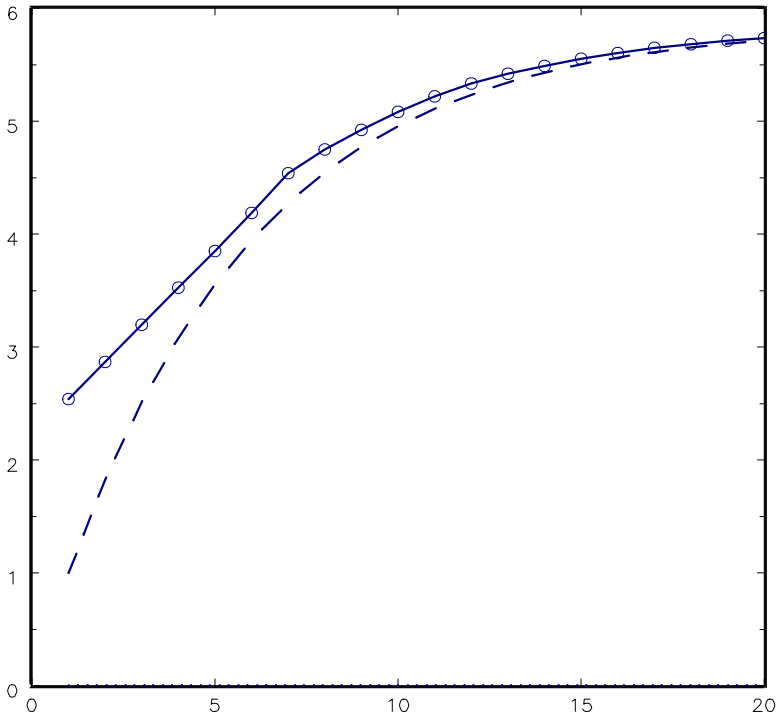
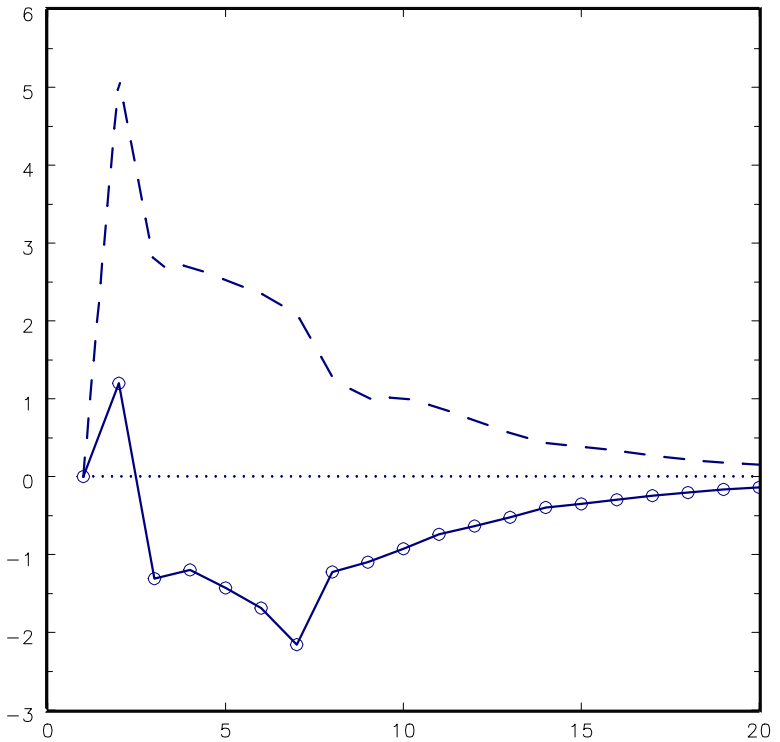


price level (o) &
Money supply (– –)



real interest rate(0)
nominal interest rate(–)



impulse response of theta1