The New Keynesian Transmission Mechanism

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October 27, 2015

Intro 1: Motivation I

- The 3-equation model is widely used because it is a minimal model that can capture a key IR:
  - Output to monetary shocks
- It is also a minimal model that captures a widely recognized intuition: Demand-driven fluctuations through intertemporal substitution
- As a consequence, it is the main vehicle for investigating
  - qualitative feature of various policy tools, such as forward guidance (e.g. Werning 2012) and fiscal multipliers (e.g. Woodford, 2011)
  - amplification and mitigating mechanisms, such as financial acceleration (BGG, 1999) and the effect of credit constraints (McKay et al, 2015)

Intro 2: Motivation II

- However, The 3-equation does not produce movements in output solely from movements in aggregate demand, but also in any other GE model, movements in supply
- In particular, the demand for output has to square with labor supply of the representative agent
- This is an element that is typically not stressed when discussing the model

Intro 3: Claim

- We take the supply side of the model seriously and ask what are the driving factors in the determination of labor supply
- Our result: Labor supply moves in tandem with consumption demand because firm profits
  1. are given to the *representative agent*
  2. are *large* and responds *countercyclically*
- Mechanisms
  - Large profits: Reduces income effect of wages
  - Countercyclical profits: Direct income effect
- That profits are large and countercyclical is well-known, but to our knowledge not well known that these features are essential for the model performance

Intro 4: What we do

- To make the argument as clean as possible we compare the 3-equation model under BGP-preferences to a model where firms profits are given to capitalists outside the model
- In the WC model, there is no effect from monetary policy on output
- This is not an artifact of our unrealistic thought experiment
  - We construct a more realistic model with financial trade between workers and capitalist
  - Without trading costs, the model generates an increase in debt-to-income of approximately 600 % to a 25 basis point shock
  - If we constraint the debt response a little by increasing the trading costs, the output response is eliminated

Intro 5: Generality?

- The profit channel arises due to the assumption of frictionless labor supply
- It should not extend into environments where workers are constrained to supply whatever is demanded, e.g. the Erceg (2000) model
- In fact, we show that there is little or no difference between the representative agent and the WC model in the Erceg framework

Intro 6: TFP

- We also discuss the IRs to TFP shocks, another area in which the 3-equation has been deemed successful
- It can match the countercyclical response of hours (Gali, 1999)
- We show that this result is also an artifact of the response of profits
- Hours decline because the increase in profits is so large that workers want to work less even though wages rise

Intro 7: Consequences

- We highlight a problematic feature of the 3-equation model
- It does not mean that the intertemporal substitution and aggregate demand are dead ends
- It means that without additional features, the intertemporal substitution and aggregate demand channel is difficult to square with movements in labor supply
- I.e. the 3-equation model is this sense to minimal for discussion of monetary policy and TFP shocks

New section: Models

- Presentation of the similarity and difference between the standard and WC model
- Why this particular WC model?
  - The essential property is that only labor income is consumed by workers in equilibrium
  - This could be achieved by making workers hand to mouth instead
  - But due to profits being countercyclical, the Taylor rule has to be inverted
  - Ergo, our WC model is the simplest way of removing profits while maintaining rest of the model constant

IRs of the two models to monetary policy shocks

- Model outcomes are identical beside the behavior of hours and output
- What is going on?

Explanation

- Under BGP preferences, hours are determined by $\frac{D_t}{W_t}$
- Large profits in steady state reduces inomce effect of wages
- Countercylical profits becomes a direct income effect

Allowing bond trade

- To show that the results are not an artifact of the way we constrain demand in the WC model, we now allow for bond trade between workers and capitalists
- To close this nonstationary model, we add bond holding costs (Schmitt-Grohe, 200)
- With costs $\rightarrow 0$, the bond trade model is very similar to the representative agent model, but with the added response that debt-to-income increase by 600 % to a 25 basis point shock
- When we constrain this response to be sensical, the output response quickly dies

Introducing rigid wages

- The effect of profits goes through the determination of labor supply
- In models where employment is demand determined we should not expect the profit channel to be operating
- We show this by studying one such model, the Erceg et al (2000)

IRs of the two models to monetary policy shocks

- Model outcomes are identical
- What is going on?

Explanation

- Under wage rigidities, hours are determined by labor demand
- Auxiliary result: Profits become procyclical and so capitalist contribution to demand becomes procyclical

TFP shocks

- We have shown that the effect of monetary policy shocks in the model without wage rigidities rely on the counterfactual profit channel
- We now show that it also account for another IR which have been deemed successful by many researchers: Countercyclical response of hours to TFP shocks
- Describe experiment

Explanation

- The profit response dominates the wage response