Teaching Statement

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I have learned firsthand how good instruction serves to inspire. I remember, back as a teenager, stumbling upon the introductory book *Economics* by Paul Samuelson early and being captivated by the interplay of intuition, examples, diagrams, and clear prose. The text illuminated the central concepts of the discipline, highlighted their policy relevance, and instilled one of my favorite mottos: 'cool heads at the service of warm hearts.'

Effective teaching is lively and successfully distills challenging material into intuitive, digestible chunks. I first put these ideas to practice as a teaching assistant at UC Irvine, which encompassed introductory and intermediate microeconomics and macroeconomics, intermediate econometrics, and global economy. My primarily responsibilities included holding weekly discussions and office hours, assisting with exam questions and design, and critiquing student essays. As a rule, if multiple questions arose on the same issue, I wrote a polished, general answer to the whole class, recognizing that for each individual who vocalizes a concern, there are several others who share the same doubt but have been too shy open up. I have maintained this practice since.

Full-time teaching, first at Tongji University and then at Hong Kong Baptist, has enabled me to further develop my teaching philosophy and protocol.[1] In the undergraduate Money and Banking course at Tongji, I provided a general and coherent exposition of the key topics by sequentially building on the overlapping generations models emphasized by Champ, Freeman, and Haslag in *Modelling Monetary Economies*. The course initiated by motivating what gives intrinsically useless pieces of paper value and the benefits of a fiat money system vis-à-vis barter and commodity money, bringing in historical examples of coinage in China, the New World silver trade, and the gold standard. The course then tackles the welfare costs of inflation–both in terms of the intertemporal distortion of consumption and also in affecting output–and expounds the impossible trinity in international currency markets. Next, we allowed for more assets in the economy (capital), and explained the tradeoff between liquidity and rate of return. Banks arise as an institution which

[1] More information on the masters level course can be found on my mariorafaelsilva.com.

issue (liquid) demand deposits and invest into (illiquid) capital. Banking allows the economy to marshal saving toward higher-return illiquid asets while giving allowing households to draw on demand deposits. We also investigate how banks can reduce monitoring costs when making loans to entrepreneurs who invest in risky projects and there is costly state verification. Financial intermediation allow us to distinguish between fiat money and 'inside money' (demand deposits), the sum of which constitute $M1$. From that point on, we study the central bank roles of reserve requirements and lending, also addressing the implications of backing central bank money with productive assets. The last section of the course focuses on how the financial system can go awry. We extend the model to explain potential breakdowns in the payments system, bank risk, liquidity risk, and bank panics, and wrap up with a simplified treatment of credit cycles as in Kiyotaki and Moore (1997). The key features of this economy are that lenders must secure debt with collateral, but durable assets serve as both collateral and factors of production. Under an adverse shock, financial constraints redistributes land toward less productive firms, reducing aggregate output and productivity.

At Tongji, I also teach the second-semester doctoral course in macroeconomics, which helped provide a very useful baseline for subsequent macroeconomics instruction at Hong Kong Baptist. Equipping students with the necessary tools, developing intuition, and keeping them engaged was a formidable task. Time series concepts, fundamental to macroeconomics, served as the springboard. We discussed VAR models and Markov processes, filtering (contrasting the Hamilton regression filter with the HP filter), structural VAR's and identification under the recursivity assumption, and the robustness of implementing VAR's in levels. Second, we studied dynamic programming, highlighting the role of recursive methods and time invariance once the state variables are recognized. We prove the Principle of Optimality and Contraction Mapping Theorem and applied the thoery on a computer, closely referring to quantecon. It is vital that students both be able to implement the theory on a computer to appreciate its significance and also to develop good programming habits.

Once these foundations were, we examined the real business cycle model in detail, including its steady state properties, calibration, log linearization, and solution via either the methods of Blanchard-Kahn or Sims' generalized Schur method. Among the most important extensions were investment-specific productivity shocks with variable capital utilization, pioneered by Greenwood

et al. (1988) and reflecting Keynes' ideas of the variable user cost of capital contributing to economic fluctuations. Afterwards, we studied some asset pricing and the role of precautionary saving in generating a liquidity premium in Aiyagari (1994). Households' greater willingness to hold capital for precautionary reasons pushes down the rental rate of capital, stimulating capital accumulation and labor demand. Having only considered real frictions thus far, the next block focused on the basic New Keynesian model and evidence of price stickiness; determinacy, optimal monetary policy, and related issues; and the financial accelerator. The latter encompasses both the limited enforcement friction of Kiyotaki and Moore (1997) and the costly state verification problem in Bernanke et al. (1999), which also endogenizes bankruptcies. With its real, monetary, and financial frictions, this model is the first one to simultaneously capture many components of real-world fluctuations.

The subsequent block introduced the role of business formation/endogenous variety and unemployment. The next lecture augments the business cycle model to include entry and endogenous variety, with labor used both to produce existing goods and develop new ones. The model, developed by (Bilbiie et al. (2012)), gives rise to an extensive margin of investment and accounts for proyclical profits. Taste for variety (and the markup) affect the first-order dynamics of the price of goods relative to the price index and the investment margin.

In the last part of the course, we studied the Mortensen-Pissarides model of unemployment. For this, I follow the superb treatment in Petrosky-Nadeau and Wasmer (2017). The basic model boils down to the job creation condition, which relates the hiring costs to the job surplus; the Beveridge curve, which connects the unemployment rate to the separation and job finding rates; and the wage setting curve, which shows how market tightness (the ratio of vacancies to unemployed job seekers) influences the wage via bargaining. We diagrammatically and algebraically analyze the steady state equilibrium before turning to the simple business cycle model with productivity shocks. Here, we discuss the unemployment volatility puzzle identified by Shimer (2005) for a standard calibration. Following Petrosky-Nadeau and Wasmer (2017), we discuss how alternate parameterizations give rise to strong nonlinearities from the matching frictions, so that linearization is no longer sufficiently accurate. I review with the students an efficient Euler-equation based method to solve the model and provide them with a program. In a homework assignment, the students study the implications of integrating the labor search model into a real business-cycle setting by Merz (1995), which

include the following: because matches take time to form, labor productivity leads employment over the cycle, the real wage is less volatile tha productivity, and history dependence of employment raises persistence of output. Finally, as part of a group, the students present and write a referee report on a paper to the class, which examines extensions and related issues. To incentivize students to pay close attention to their peers' presentations, I ask several small questions on the final exam about the material presented.

At Hong Kong Baptist University, I have adapted this approach to the Masters level macroeconomics course. This course has also enabled me to integrate a liquidity-based theory of monetary policy transmission à la Geromichalos and Herrenbrueck (2021) in the instrution. This framework allows for the standard real balances effect in New Monetarist models but also explicitly incorporates open market operations and imperfectly illiquid capital. I have also had the opportunity to expand beyond standard monetary economics in teaching the Economics of Digital Currencies jointly with Kim-Sau Chung. Part of this course focuses on the potential for central bank digital currencies to enhance liquidity and financial inclusion and reduce costs of cross-border exchange. It also addresses concerns about potential disintermediation in banking, identifying the key microeconomic ingredients and bringing in evidence on the competitiveness of the banking sector.

I conclude by summarizing two key tenets with inform my teaching philosophy and practice, which are also useful for research. The first, echoing Dani Rodrik in *Economics Rules: The Rights and Wrongs of the Dismal Science*, is that the appropriate degree of abstraction in a model depends on the context of the problem. Pedagogically, it is sensible to teach simple content and gradually complicate it, expanding the range of questions we can address and the robustness of the answers. I carefully structure the order of topics in my courses to adhere to these guidelines.

The second principle is that it is crucial, especially in macroeconomics, to carefully interweave theory, empirics, and computation. At a minimum, students new to know which data sources are available, conceptually distinguish cycles from trends, and identify key patterns. Early exercises should help students visualize, for instance, that investment is a much smaller fraction of output than consumption but exhibits much higher volatility, and thus plays an important role in business cycles.[2] In the PhD instruction, I provide well-tested, clean programs for baseline applications and

[2]Brian Jenkins, a professor who I had the pleasure of serving as a teaching assistant, is exemplary this regard. After homework is due, he provides students with Python scripts that download the data off the fly and run the

ask students to develop extensions. In a different context, I have also made use computation and various instructional exercises in the undergraduate course Data Analytics for Business Decision Making at HKBU. For more information, please visit mariorafaelsilva.com.

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analysis. He even has a built-in module in his webpage that simulates the Solow growth model directly and has extended this to include the Mortensen-Pissarides labor search model as well.