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# WHAT SHOULD BE TAUGHT IN INTERMEDIATE MACROECONOMICS?

Pedro de Araujo, Roisin O'Sullivan, and Nicole B. Simpson[*]

*Abstract:* A lack of consensus remains on what should form the theoretical core of the undergraduate intermediate macroeconomic course. In determining how to deal with the Keynesian/classical divide, instructors must decide whether to follow the modern approach of building macroeconomic relationships from microfoundations, or to use the traditional approach based on aggregate models of the macroeconomy. In this article, the authors discuss the advantages and shortcomings of each approach in the context of course objectives. Because there is significant heterogeneity in textbook coverage, the authors summarize some of the approaches taken in current intermediate-level textbooks, which should serve as a useful starting point for new instructors. The authors also discuss how each approach can be extended to analyze the recent recession in the United States.

*Keywords:* AD/AS, intermediate macroeconomics, IS/LM, microfoundations, neoclassical, new Keynesian

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A confluence of events has underscored the need to evaluate what is taught in the undergraduate intermediate-level course in macroeconomics. Within academia, widespread divergence exists between what is taught in graduate and undergraduate macroeconomic classes. The emergence of the modern approach to macroeconomics that prevails in most graduate schools and dominates many academic journals has given rise to a new challenge for undergraduate instructors in deciding if and how these more complex, mathematically rigorous models should be incorporated in their teaching. Moreover, instructors have to make this decision against the backdrop of the recent U.S. financial crisis and associated economic recession. These events amplified the role of macroeconomic theory in national policy discussions and brought renewed interest in the traditional divide between supporters of Keynesian policy interventions and those with a more Classical view of the world. As students' interest in applying their academic knowledge to what was unfolding in the world was heightened, limitations of both traditional and modern macroeconomic models to analyze such events were revealed. In this context, the time seems right to assess what instructors might teach to intermediate-level undergraduate students.

There has been much convergence among research economists from across the spectrum in terms of the best approach to macroeconomic modeling, with both new-Classical and new-Keynesian models being built from microfoundations and incorporating rational expectations. This consensus has brought a lot of consistency to what is generally taught in macroeconomics courses at the graduate level. However, the degree of technical difficulty involved with these models along with other factors has prevented them from being widely adopted in undergraduate courses. Moreover, recent economic events have led to a greater questioning of the adequacy of

these models. For macroeconomic educators, these issues give rise to significant challenges in deciding the content and structure of their core theory courses.

The Great Recession, with its origins in the financial sector of the economy, highlighted limitations of existing intermediate macroeconomic models. Additionally, the fiscal and monetary policy responses to the crisis went well beyond the conventional policy tools generally emphasized in undergraduate texts. And, the global nature of the crisis highlighted the interdependence among nations and their policy decisions. These issues make it difficult to determine the appropriate boundary between intermediate macroeconomics and other courses such as money and banking, international finance, or even economic history. Should the core content of intermediate macroeconomics adjust in light of recent events? Some recent articles (*The Economist* 2010; Gärtner, Griesbach, and Jung 2011) suggest that it should and the latest editions of most intermediate macroeconomic textbooks have made explicit efforts to expand coverage to incorporate recent economic developments.

As with any course, the decision about what to teach in intermediate macroeconomics will be driven by a variety of factors. Chief among them, however, must be the instructor's course objectives, which may be predominantly skill- or content-driven. The selection of textbooks available for the course will also exert a major influence, especially for newer instructors who are likely to rely more heavily on the guidance the text provides. Undoubtedly, an instructor's training and consequent theoretical views are likely to affect which objective or combination of objectives they consider paramount and guide their textbook choice. Moreover, the prevailing economic environment will often drive decisions about priorities and emphasis for a particular semester.

Given these considerations, instructors are faced with three main decisions: 1) the usual decision about how the course will address different schools of macroeconomic thought, a decision crucial to how stabilization policy issues are addressed; 2) the decision as to where the course should fall on the traditional-modern spectrum; and 3) the decision on how much to focus on one particular framework versus how much to present competing frameworks. In making these decisions, intermediate macroeconomic instructors are faced with trade-offs, such as, for example, those between the depth and breadth of their coverage, and between theoretical rigor and emphasis on applications of macro theory to current events and policy decisions.

The remainder of the article is laid out as follows. The next section outlines some key factors for establishing the content of the intermediate macroeconomics course. This is followed by examples of traditional and modern approaches to teaching intermediate macroeconomics. The advantages and disadvantages of both the traditional framework and more modern approaches, including both new-Classical and new-Keynesian models, are highlighted. A discussion of some of the leading textbooks targeted at the intermediate level is then provided, along with examples of how these textbooks have extended their coverage in light of the recent financial and economic crisis. The final section concludes.

## FACTORS INFLUENCING THE CONTENT OF THE INTERMEDIATE MACROECONOMIC COURSE

A multitude of (interrelated) factors has the potential to influence the content of any particular intermediate macroeconomic course. This section briefly reviews some of them including: general course objectives, the role of institutional considerations, the connection to graduate-level study and general macroeconomic research, and the influence of the current economic environment. For many instructors, the design of their course will be guided by the approach(es) taken in intermediate-level textbooks that best meet their objectives.

As with any course, the learning objective(s) that instructors set out act as the overriding determinant(s) of the content of the intermediate macroeconomic theory course. These might include: 1) general economic learning goals, such as an overview of the workings of the macroeconomy with an ability to understand and assess macroeconomic policy debates; 2) content-driven objectives based on an in-depth understanding of a specific model or set of models to prepare students for future coursework, reading academic journal articles and/or graduate study in economics; and/or 3) meta-skill objectives, concentrating on analytical thinking and certain technical skills.

These objectives, of course, often are not mutually exclusive and encompass some more specific goals of the instructor. For example, the intermediate theory level is often where instructors aim for students to develop and deepen their understanding of economic modeling, focusing on the role of assumptions, the distinction between exogenous and endogenous variables, and specifying the relationship among variables both mathematically and graphically.

Institutional considerations can play a significant role, influencing the preparation of students entering the course (e.g., separate or combined introductory-level course, math prerequisites, sequencing of intermediate micro- and macroeconomic courses), the options available to students upon completion of the course (e.g., availability of an advanced macro theory course or upper-level electives on topics such as growth or open-economy macro), the length of the semester, the number of hours the class meets, and the availability of support services. These institutional considerations should help guide instructors in determining the appropriate level of mathematical rigor for the course. Regardless of the degree of mathematical sophistication employed, the importance of judging levels or movements in economic variables against some kind of soundly-based benchmark provided by economic theory is a habit that can

be very effective at dispelling mistaken or poorly-thought-out ideas. Having this sort of discipline is important for students to become economically well-informed citizens, capable of logically assessing economic policies and identifying good (and bad) economic analysis when they see it.

The particular model or set of models used by the instructor to accomplish these goals is likely to be influenced strongly by the instructor's theoretical views and training. Most would argue that a micro-founded approach has become the standard approach to macro-modeling for new-Classicals and new-Keynesians alike at graduate schools and among research economists. Blanchard (2009), Woodford (2009) and Chari, Kehoe, and McGrattan (2009) discuss the convergence in macroeconomic research based on dynamic stochastic general equilibrium (DSGE) foundations. However, the recent crisis has led economists to question the use of these models as the primary workhouse to explain the entire economy (Caballero 2012; Fair 2012; Howitt 2012). Alternative models are being suggested, such as agent-based computational models (Howitt 2012) or more traditional models that often drop the rational expectations assumption (Fair 2012).

This ongoing and heated debate presents additional dilemmas for the macroeconomics instructor. By focusing on how the models are constructed, however, students can move beyond the particular details of the model and explore the implications of different assumptions, making the details of any one model less central to the course. It also allows students to see the limitations of a certain model or set of models so that they get a sense of the academic discourse surrounding various approaches and the dynamic nature of the field of macroeconomics.

While many instructors opt to rely on the use of one framework to reach their course objectives, others prefer to span multiple frameworks. (In the framework descriptions that follow,

several examples are highlighted where theoretical approaches could be combined.) For example, reasons for sticking to one framework may be fundamental in nature—reflecting strong theoretical views of the instructor—or may be more practical, simply reflecting realistic constraints of a one-semester course. The advantage of covering multiple frameworks is that students obtain a broad perspective so that they can compare the fundamental differences in the various approaches, and be allowed to choose the model that seems most appropriate for their purpose. Students would also get a glimpse of the deep-seated methodological debates in macroeconomics, giving them some flexibility in choosing upper-level electives within the various approaches.

No matter what the framework(s) used, the application of economic theory to current or past economic developments is often a top priority for macroeconomic instructors.[1] This is particularly true when economies face extreme conditions such as those experienced with the financial crisis. While recent events have highlighted serious shortcomings in our knowledge of the how the macroeconomy works, at this point it is not clear what the nature and extent of the impact will be on the theoretical foundations of the intermediate macroeconomics course. The most obvious potential impact given the origins of the recent crisis lies in the role given to the financial sector in macroeconomic models. The crisis and related recession have also had a profound impact on how macroeconomists think about monetary and fiscal stabilization policies.

The severity of the economic downturn in the United States resulted in the Federal Reserve approaching the zero-interest-rate lower bound and thus turning to a range of unconventional policy tools. These have included changes to the size and composition of the central bank balance sheet (e.g., the large asset purchases program and "operation twist"[2]), the payment of interest on reserves and new uses of communication policy. The latter, in particular,

puts an increased focus on the management of expectations and the need for dynamic analysis. It

needs to be borne in mind, however, that the theoretical foundations we teach our students must

serve them over the long term. Even in these unusual times, they still need to learn about the

conventional tools central banks use as part of the standard framework for monetary policy in

addition to the unconventional tools to understand current economic developments. Similarly,

the Great Recession and the related increased use of fiscal stimulus have revived interest in the

use of fiscal policy for stabilization purposes. While some models taught at the intermediate

level facilitate the examination of multipliers and the impact of fiscal policy on the economy in

the short run, for example, there is no consensus in the research literature on the effectiveness of

fiscal policy as a stabilization tool or on the size of fiscal multipliers, making it more difficult for

undergraduate instructors to decide the appropriate extent and nature of coverage for this topic.

## THEORETICAL APPROACHES TO TEACHING INTERMEDIATE MACROECONOMICS

In this section, we outline the main approaches to teaching the short-run components of

intermediate macroeconomics. These include the traditional approach, which uses aggregate

models (such as the IS/LM), the new-Classical approach based on microfoundations, and the

new-Keynesian approach centered on the three-equation model with a short-run Phillips curve.

For each, we provide a brief evolution of the approach, discuss its advantages and disadvantages,

and how the approach might be used to understand recent events. Where applicable, we highlight

ways in which instructors might combine elements of different approaches.

**The Traditional Approach to Teaching Intermediate Macroeconomics**

Some form of the IS/LM model, with its origins in Hick's interpretation of ideas from Keynes's

general theory, has played a central role in intermediate macroeconomics courses for decades.[3]

The IS/LM model is often used as a building block for the aggregate demand curve of the

AD/AS framework and provides a concise mechanism for analysis of the qualitative impact of monetary and fiscal policy on the economy. The primary advantage of the traditional approach is that students in an intermediate macroeconomics course can acquire a coherent framework within which they can think about macroeconomic issues. In this unified framework, students can make linkages between the various sectors of the economy and the interconnections between different economies, and apply this kind of thinking to policy issues, analyzing the costs and benefits of macroeconomic policy in various macroeconomic situations.

Building the IS and LM curves from underlying models and using that model as a foundation for AD/AS allows students to see the connections between the short run and long run and the important role played by modeling assumptions such as the assumption of pre-set prices, thus meeting many of the primary objectives set out in the previous section.[4] Students can use the framework to see how the economy can either self-adjust from a short-run to a long-run equilibrium position or how stabilization policy might work to achieve that adjustment. The model is rich enough to analyze the impact of a wide variety of shocks on the economy, and in particular, can show the adjustment of prices in the long run to restore general equilibrium. It can also be adapted from a closed-economy setting to a small open-economy setting. The addition of an upward-sloping SRAS curve allows students to explore the impact of a less extreme assumption than fully pre-set prices in the AD/AS model or a situation where short-run deviations from optimal output arise from frictions such as imperfect information, thus incorporating a more classical flavor to the short run analysis.

The persistence of the traditional approach by no means suggests it has been without its critics, and many of the flaws that have been highlighted are of a serious nature. Fundamentally, the IS/LM model has been criticized for its lack of microfoundations and the consequent ad hoc

nature of the relationships it puts forward between key aggregate variables, as well as the absence of a central role for expectations (Romer 2000). Barens (1997) provides an overview of the development of the IS/LM model over the decades and uses this development to provide a view on what went wrong with IS/LM-AD/AS analysis. The core of the issue lies in the inconsistency of the assumptions behind the models used in terms of the flexibility of prices. The version of the IS/LM model that has been adopted by modern-day textbooks assumes a given price level and this is used to build an AD curve that forms part of a model to endogenously determine the price level.

Colander (1995) delves into more detail about the inconsistencies between the standard interpretation of the AD curve and Keynesian foundations. He emphasizes the problem in standard AD/AS models that treats the AD curve derived from the Keynesian aggregate expenditure/aggregate production approach (that is generally used to derive the IS curve) as being based on a *ceteris paribus* assumption, when the underlying analysis clearly involves an interactive effect between demand and supply. The multiplier effects that are central to the Keynesian cross model are obscured. He also points out problems with the dynamics implied by the model in response to shocks.

Several articles have suggested various ways to remedy one or more of the perceived faults with the standard textbook presentation. For example, Romer (2000) and Williamson (2011) outline an approach where the LM curve is replaced with a real interest rate rule. Weerapana (2003) builds on this idea, making the case for replacing the traditional framework with an AD/PA (i.e., aggregate demand/price adjustment) model based on the work of Romer (2000) and Taylor (2000).[5] An important contribution of Weerapana (2003) was to introduce liquidity trap effects into the AD/PA framework, which changes the shape of the AD schedule at

the zero bound. Similarly, Jones (2011) replaces the LM schedule in the short-run model with a simple Taylor rule whereby the central bank sets the nominal interest rate in response to inflation only. By replacing the LM line with a Monetary Policy (MP) rule, the model builds in the Federal Reserve's reactions to economic shocks. The use of an interest rate rule becomes problematic, however, when the zero-interest lower bound becomes a binding constraint, and unconventional tools, such as quantitative easing are employed, and more generally when the Fed does not follow the Taylor rule, which it has not done for the recent past.

Addressing the criticism of the ad hoc nature of some of the economic relationships presented in the traditional approach, some instructors have incorporated elements of the modern micro-founded approach into the traditional framework. For example, discussions of the labor-leisure and savings/consumption models can be used to segue into aggregate labor and capital markets. The instructor can then show how the labor, capital, and money markets feed into the traditional aggregate models. This approach allows students to see the derivation of Keynesian macroeconomic models, rather than hand-waving about the model's fundamentals. However, different from a pure micro-founded approach, it allows students to put the various components of the macroeconomy together into one comprehensive model that is accessible to undergraduates.

With respect to analyzing the response to the financial crisis, perhaps the most relevant shortcoming of the traditional framework is the lack of complexity with which it treats the financial system. While the interest rate plays a central role in the IS/LM model, the focus is on a single interest rate for the economy. Moreover, there is no explicit role for credit market frictions in the standard model. In terms of analyzing policy responses to the related economic downturn, the traditional approach has both strengths and weaknesses. Regarding monetary policy, the

money supply focus of the LM curve does not mesh well with the interest rate focus of modern conventional monetary policy. In the face of the zero lower bound on interest rates, however, and the subsequent reliance on unconventional tools such as asset purchases by the Federal Reserve, the focus on the money supply is useful. The traditional approach does not measure up well to the renewed interest in the use of fiscal stimulus in the wake of the crisis, given the shortcomings in translating fiscal policy multiplier effects from underlying models into the AD/AS framework.

Efforts are being made, however, so that students can analyze the recent financial crisis within the traditional framework. In a straightforward way, the decline in housing and equity prices can be modeled as a reduction in wealth, causing the IS curve to shift left. Credit constraints and risk premia are now being modeled using the IS curve in recent textbook editions, as discussed in the next section. Still, modeling the impact of the monetary policy response is challenging in the context of recent events since traditional models do not lend themselves to the analysis of unconventional policy responses such as "operation twist" or those based on the management of future interest rate expectations.

**The Modern New-Classical Approach**

The origins of the modern approach can be traced back to the rational expectations revolution of the 1970s, and the associated Lucas critique, when the large-scale macroeconometric models of the Keynesian tradition came under increased attack.[6] The idea that important relationships between aggregate variables, considered until then structural, were in fact likely to vary with policy due to the influence of policy changes on private decision-makers' expectations of the future, came to the fore. The confluence of this idea, and the technical tools to accommodate the analysis of forward-looking behavior, allowed macroeconomists to rethink the way their models were set up and analyzed. The "microfoundations of macroeconomics" revolution began, in

which individual-level decision-making became explicitly modeled. This set the table for the freshwater/saltwater divide that prevailed until the emergence of a new synthesis in the 1990s, when both schools of thought converged on the use of micro-founded DSGE models as their primary tool.[7]

The new-Classical approach to intermediate macroeconomics uses real business cycle (RBC) theory as the primary model. The one-period labor-leisure model is first introduced, followed by the two-period model with endogenous labor supply and investment. Unless intermediate microeconomics is a prerequisite for intermediate macroeconomics, the professor taking this approach needs to teach the necessary micro models (i.e., labor-leisure and savings-consumption) at the onset. A detailed review of microeconomic theory and calculus can be useful, where students need to understand the concepts of indifference curves and consumer equilibrium.[8]

A major advantage of the new-Classical approach is that it is straightforward to illustrate the connection between the long and short runs. The instructor can show that by increasing the number of time periods in the basic two-period model with production, the solution to the consumption policy function converges to the Solow consumption function (with Cobb-Douglas preferences) from growth theory. In this framework, students can understand the connection between macroeconomic models and stylized facts. For example, in the two-period endowment model, one can easily demonstrate consumption smoothing behavior by imposing exogenous shocks to income through taxes or to the actual endowment. This allows the instructor to discuss how model calibration can be used to mimic certain stylized facts, and provides a glimpse of how cutting-edge macroeconomic research of this type is performed.

In this approach, students are required to build a strong set of mathematical and analytical skills and thereby create a tool kit that can be used in upper-level macroeconomic electives. This toolkit involves having students solve systems of equations with closed form solutions in which the solutions have rich economic interpretations. This enables students to see the connection between an algebraic solution and its graphical representation. It also allows them to see how certain parameters can influence the implications of the model.

The new-Classical approach can be used to address macroeconomic policy issues such as taxation, government spending and monetary policy. For example, micro-founded models with either money in the utility function or alternative models, such as cash-in-advance models, can be introduced to study monetary policy. Students can derive the money demand function from these models and study how exogenous shocks to output or the interest rate affect the money market. In addition, frictions can be added into these models so that monetary policy can be analyzed.

The downside is that students have to analyze a different type of model (albeit in a similar setting) for each policy tool and compare the costs and benefits within the different models. For example, two of the most important macroeconomic concepts, unemployment and inflation, are quite difficult to capture in new-Classical models with rational expectations. Thus, an alternative model, such as a search theoretic framework, must be introduced to give students an accurate account of the microfoundations behind these important macroeconomic concepts. The time required to teach these models to undergraduates can be quite significant, leaving little time for other serious policy debates. In addition, the theoretical construction of representative agent models makes it difficult for students to differentiate between demand- and supply-side factors (Froyen 1996).

In light of recent events, the new-Classical models can be modified to address certain aspects of the financial crisis by adding frictions to financial markets that lead to volatility in aggregate variables, which are discussed in more detail in the textbook section. It is important to ensure that students are aware that these are not models of the causes of the financial crisis, but rather constructions of frictions in micro-founded models that generate volatilities in real variables that are similar to their behavior during the crisis. This approach uses the financial crisis as a hook to engage students in making connections between the abstraction of models and the concreteness of economic data.

**The Modern New-Keynesian Approach**

The new-Keynesian approach incorporates many of the elements of the new-Classical approach, in that it is based on microfoundations and incorporates rational expectations. The primary difference relates to the assumptions underlying the models, with new-Keynesian models, for example, incorporating some form of market imperfection or price rigidity that gives rise to a potential role for government policy to stabilize the economy in the short run. In contrast to the traditional Keynesian approach, however, the aggregate relationships that allow for stabilization policy in the standard three-equation new-Keynesian model can be built from microeconomic optimizing behavior, although this can be accomplished only with a variety of ad hoc assumptions, which makes it unclear how much less ad hoc this is compared to the standard model.

The key components of the new-Keynesian framework at the intermediate level are usually an (expectational) IS curve, a monetary policy (interest rate) rule and the new-Keynesian short-run Phillips curve (i.e., an upward-sloping short-run aggregate supply curve), which obtains its shape from firms optimizing in the face of price stickiness. A common way of

incorporating price stickiness is to make price changes time dependent, *a la* Calvo (1983) for example, where only a random fraction of firms can change their prices in any given period. In this set-up, inflation depends on expected future inflation instead of expected current inflation. This assumption allows for a dynamic AS curve, where expectations about future inflation affect output in the short run. Thus, expectations about future monetary policy and demand shocks cause the dynamic AS and AD curves to shift and the model allows for differentiation between the effects of anticipated and unanticipated aggregate demand shocks. The dynamic, forward-looking nature of the three-equation new-Keynesian model, therefore, overcomes some of the shortcomings of the traditional Keynesian approach for analyzing recent unconventional monetary policy actions, such as those relating to communication policy aimed at managing expectations. The interest-rate rule component, however, faces limitations for analyzing other unconventional tools, such as quantitative easing, as noted earlier.

The new-Keynesian approach shares many of the advantages of the new-Classical approach over the traditional Keynesian model (including being closer to the research frontier) and indeed encompasses the RBC new-Classical model as a special case where prices are completely flexible. In contrast to the new-Classical model, however, the standard new-Keynesian model allows, within one framework, the analysis of both short-run AD and AS shocks on inflation and output, with potential stabilization roles for both monetary and fiscal policy. The underlying price stickiness assumption allows for an impact of aggregate demand management policies on output as well as prices in the short run, although the size of any impact will be influenced by whether or not the policy move was anticipated. It focuses on the interest rate rather than the money supply and thereby is easier to relate to discussions of interest rate policy. The new-Keynesian model also provides a nice framework within which to talk about

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time inconsistency of optimal policy (Kapinos 2010) and to discuss the role of anchoring expectations and of communication (Blanchard 2011).

The challenges in teaching the new-Keynesian approach can be significant. As with the new-Classical approach, a substantial amount of time must be devoted to introducing the three-equation model. Instructors may choose to teach the model without detailing the microfoundations behind the aggregate equations, but this may lead to problems similar to those associated with the traditional Keynesian approach, where students may view the model as somewhat of a black box. Instructors who attempt to derive the three-equation framework from microfoundations will find it to be quite rigorous (and more so than the typical RBC model) because introducing the short-run effects of price stickiness is complex. As a result, instructors may find it more straightforward to focus on the traditional approach but add some dynamics into that model instead of teaching the microfoundations (which is the approach taken by some textbooks, as discussed below). Another approach would be for the new-Keynesian model to be taught after students are well-trained in the microfoundations of the new-Classical approach, as many of the relevant building blocks would be better understood by students, allowing instructors to focus on applications. However, this strategy would likely require more time than is usually available in a one-semester course. Creating a two-course sequence for the material typically covered in intermediate macroeconomics is an idea that has been considered for quite a while. For example, Davis (1996) and Erekson, Salemi, and Raynold (1996) discuss the possibility of moving growth theory from the intermediate macroeconomics curriculum into a separate course, thereby allowing more time to focus on short-run models.

Similar to the new-Classical framework, getting students to understand dynamic equations and the interlinkages between them is cumbersome in an intermediate course, but

perhaps is more complicated in the new-Keynesian framework with forward-looking expectations. In fact, confusion can arise among students if the initial models from which everything is derived are grounded in rational expectations since inflationary expectations are treated somewhat differently in different parts of the model.[9] Relatedly, discussing the importance of price rigidities in the context of unanticipated events (i.e., shocks and policy) is a fairly deep concept for undergraduates to absorb and retain early in their academic career.

New-Keynesian models suffer from potential theoretical shortcomings that were recognized long before the recent crisis. For example, Colander (1998) points to how the models tend to simply assume the existence of a unique equilibrium towards which the economy gravitates and do not adequately deal with issues such as coordination failure. More recently, Howitt (2012) suggests that modern DSGE models, with their assumption of forward-looking rational expectations, over-fit the data, a criticism that can apply to both new-Classical and new-Keynesian models. Howitt (2012) also points out that new-Keynesian models require parameters and shocks to be structural, so that they are invariant to policy changes, while Farmer, Waggoner, and Zha (2007) claim that some specifications of the used interest rate rule may lead to indeterminate equilibria. Others have pointed to shortcomings of new-Keynesian models in matching the movements observed in data (see, for example, Chari, Kehoe, and McGrattan [2009]) leading to concerns surrounding their policy predictions. Therefore, even if a modern approach is taken by new intermediate-level instructors based on relatively recent graduate school training, all instructors would benefit by remaining informed about the current state of research and be open to adjusting their courses where appropriate.

In terms of analyzing the recent crisis, the new-Keynesian framework is probably the best positioned of the three approaches discussed, given the dynamic, forward-looking nature of the

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model and the way in which it facilitates policy analysis. It remains far from ideal, however. Recent updates that seek to address some of the shortcomings of the basic new-Keynesian model include Alpanda, Honig, and Woglom (2011) and Kapinos (2011), who incorporate flexible inflation expectations, risk-premia shocks, lower bounds on nominal interest rates and deviations from a Taylor rule, bringing the models even closer to those used by policymakers and academics.

## TEXTBOOK OPTIONS FOR INTERMEDIATE MACROECONOMICS

The adoption process for textbooks, especially for intermediate macroeconomics, can be cumbersome given the significant heterogeneity in textbook coverage of approaches. In this section, we summarize the key textbook offerings for the intermediate macroeconomics course. We investigated the following eight textbooks: Carlin and Soskice (2006), Barro (2008), Mankiw (2010), Jones (2011), Blanchard (2011), Abel, Bernanke, and Croushore (2011), Williamson (2011), and Mishkin (2011).[10] We categorize them by approach,[11] detail their coverage of the main topics in intermediate macroeconomics, and provide specific examples of how they apply undergraduate macroeconomic theory to recent events. The results of our textbook survey are summarized in table 1. Based on our analysis, most intermediate macroeconomics textbooks briefly cover long-run economic growth and place a greater emphasis on short-run theory and related policy implications.[12] However, the number of approaches offered in a textbook varies: some textbooks focus on one approach, while others present a menu of approaches, allowing instructors to choose the one that best fits their needs.

[Insert table 1 about here]

Based on textbook market shares, the traditional approach remains the most common approach to intermediate macroeconomics, with Mankiw (2010) and Abel, Bernanke, and

Croushore (2011) together representing more than 50 percent of the market.[13] In Mankiw's (2010) offering, classical theory provides the benchmark equilibrium to which the economy converges in the long run, and the IS/LM–AD/AS framework is used to capture the behavior of the economy in the short run, when frictions such as price stickiness lead to sluggish adjustment to shocks. The distinguishing feature of Mankiw (2010) is that it takes the traditional approach but adds some dynamics (via the dynamic AD-AS model) without much emphasis on microfoundations, which are relegated to the end of the book.

Abel, Bernanke, and Croushore (2011) offer a balanced treatment of classical and Keynesian ideas within one unified framework. They give a more prominent role to microfoundations than Mankiw (2010) by placing the material at the start of the book and using it to motivate the IS/LM and AD/AS models, but like Mankiw (2010), the traditional IS/LM framework is still central for short-run analysis. Blanchard (2011) also uses the traditional approach, with fewer extensions to incorporate the modern approach compared with Mankiw (2010) and Abel, Bernanke, and Croushore (2011).

Adapting the new-Classical microfoundations approach for undergraduates was first accomplished by Barro (1984), and is still prevalent in his most recent edition (Barro 2008). Barro (2008) devotes a significant amount of coverage to growth theory, which is presented throughout several chapters at the beginning of the text. He then introduces the short-run model using the RBC approach, incorporating many of the advances in macroeconomic theory in recent decades, including the new-Keynesian model with sticky prices. Throughout the textbook, Barro (2008) places a lot of emphasis on linking the long-run and short-run models and on their implications.

Williamson has also adapted the new-Classical approach to the undergraduate level. The newest version of the text (Williamson 2011), which has captured approximately 10 percent of the market, uses a unified micro-founded framework, starting with the static labor-leisure model and building to dynamic micro-founded models of the economy. Compared to Barro (2008), more emphasis is placed on short-run theory, with the real business cycle model being presented in the first part of the book. As in Barro (2008), introducing students to the dynamics of the macroeconomy are front and center in this text. Mishkin (2011) also presents the microfoundations of the new-Classical model, but they are given less emphasis than the dynamic AD/AS model.

The new-Keynesian approach is gaining traction, as more textbooks now include some version of the three-equation model. The practice of putting the new-Keynesian approach in an intermediate macroeconomic text began with Carlin and Soskice (2006), pre-dating the DSGE sections of Mankiw (2010), Jones (2011) and Mishkin (2011) through their use of the three-equation new-Keynesian model with an optimal monetary policy rule, consistent with work by Romer (2000) and Taylor (2000), who attempted to make modern monetary theory more accessible to undergraduates. The new-Keynesian approach is now the central short-run model in the Jones (2011) text, and it is introduced before any of the microfoundations are discussed. This contrasts with Mankiw (2010) and Mishkin (2011) where the traditional approach is central and the more modern approach is introduced as an aside.

Half of the textbooks we reviewed take a "unified" approach, by focusing on one approach, or class of models, in presenting the short-run (and long-run) macroeconomic theory.[14] However, several textbooks have attempted to bridge the divide between the three approaches. For example, the inclusion of a new chapter featuring a dynamic AD/AS model in a Mankiw

textbook (2010) provides students with a stepping stone towards the DSGE models. Mishkin

(2011) presents both the new-Classical and new-Keynesian models and gives the instructor the

flexibility to choose either approach (or to teach both) alongside the dynamic AD/AS model.

This contrasts to Barro (2008) and Williamson (2011), for example, who each incorporate just

one chapter on the new-Keynesian approach.

Of the eight textbooks we reviewed, the six published since the 2008–9 crisis include

ways in which the causes and policy responses of the Great Recession can be applied to both

aggregate and/or micro-founded models of the macroeconomy. Most simply, in aggregate

models such as IS/LM, leftward shifts in the IS curve can occur due to the reduction in wealth

(via a reduction in house prices) and a drop in consumer confidence. However, other

mechanisms in financial markets can be applied in this framework. For example, the inability of

consumers and firms to obtain credit can be interpreted as contractionary shifts in the

consumption and investment functions according to the forthcoming edition of Mankiw,[15]

leading to a leftward shift in the IS curve. Jones (2011) and Mishkin (2011) amend the IS/MP

model to reflect credit market conditions by building in a risk premium in the IS curve whereby

the interest rate that households face is the Fed funds rate plus the risk premium. A rise in the

risk premium in this framework causes real interest rates to increase despite the Fed's actions of

keeping interest rates low, causing output to contract. Table 2 documents some of the various

applications across the six textbooks.

[Insert table 2 about here]

In terms of policy responses, the simplest application of the traditional model indicates

that the actions taken by policymakers to expand the balance sheets of banks and to increase

liquidity in the financial system could decrease the premium charged to borrowers, resulting in a

rightward shift of the IS curve (Blanchard 2011). There is renewed interest in the potential size of fiscal multipliers, in the factors affecting the size of multipliers and in differences in the impact of expenditure-based versus revenue-based policy actions. To this point, Mankiw (2010) and Mishkin (2011) have added chapters with dynamic versions of the AD/AS model.

Micro-founded models can address some of the complex linkages between the real sector and financial markets through the introduction of a financial sector. Williamson (2011), for example, incorporates imperfect information and limited commitment to borrowing in financial markets by introducing an illiquid asset (i.e., a house). This asset can be used as collateral to borrow and anticipate consumption. The model leads naturally to discussions about the commitment of borrowers to pay back loans and how this commitment might be correlated with volatility in the housing market. Alternatively, a banking sector can be introduced as a financial intermediary that has limited information about the creditworthiness of each consumer, but acts as a profit-maximizing firm (Williamson 2011). In the model, banks cannot observe the riskiness of borrowers, such that more risk leads to higher interest-rate spreads and lower consumption, mimicking the conditions during the financial crisis.

These are just a few examples of how recent textbook editions are adapting to include detailed discussions and applications of the 2008–9 financial crisis and related recession so that instructors can confidently apply the core models of intermediate macro theory to recent events. To keep up-to-date, publishers often provide companion Web sites and webinars to supplement their texts as macroeconomic conditions evolve. The plethora of information can make it daunting for new instructors to integrate recent events into their classes. We hope that this synthesis of the most common approaches in textbooks helps instructors to choose the approach

that best suits their needs and provides them with straightforward ways to apply the models to recent events.

## CONCLUSION

As Froyen (1996) rightly stated, "The teaching of intermediate macroeconomics has continually adjusted to the evolution of macro theory" (114). This has certainly been true recently, as the financial crisis of 2008–9 spurred macroeconomists to reconsider their models and their policy prescriptions. In addition to deciding which theoretical approach (or approaches) to take, the instructor of intermediate macroeconomics has to figure out a way to make sense of current events within the confines of macroeconomic models that undergraduates will comprehend.

These recent events have no doubt triggered a greater degree of assessment of course content by intermediate macroeconomics instructors. The magnitude of the recent economic crisis and the questions it has raised about the current state of macroeconomic knowledge will likely result in this kind of assessment prevailing for many years to come. Instructors must make decisions for the long haul, choosing which standard tools to develop, while remaining open to adapting those tools as conditions change. We hope this article serves as a starting point for new instructors of intermediate macroeconomics as they grapple with these decisions, and as a useful reference for those of us who have taught the course for some time, but are seeking ways to update our material to better engage and educate our students.

**NOTES**

[1] Many instructors enhance discussion of current or historical events and policy decisions by looking at economic data or utilizing some simulation programs/games that are available. An excellent source of data for the United States is provided by the Federal Reserve Bank of St. Louis at http://research.stlouisfed.org/fred2/. For some examples of simulation exercises, see the Starting Point website at http://serc.carleton.edu/econ/simulations/examples.html.

[2] http://www.federalreserve.gov/faqs/money_15070.htm

[3] See Colander (2006) for a thorough description of the changing role of the IS/LM model since the 1960s and his thoughts on the reasons for its persistence.

[4] An alternative approach within the Keynesian tradition does not rely on price (or wage) stickiness for the economy to fail to adjust automatically to long-run equilibrium (see, for example, Tobin [1975]). The current textbooks we surveyed focus on the assumption of price stickiness.

[5] The AD/PA model appeared in Taylor's (2001) *Principles of Economics* text. In newer versions of the text, Taylor and Weerapana (2008) use the AD/IA model, with inflation adjustment (IA) rather than price adjustment (PA).

[6] See Mankiw (2006) for a concise overview of the history of macroeconomics.

[7] The terms "freshwater" and "saltwater" became common tags for proponents of the new and traditional modeling approaches, respectively, reflecting the geographic location of the institutions generally associated with them. Krugman (2009) offers a spirited discussion of the divide. The distinction on this basis has lost much of its relevance in recent times.

[8] This could be avoided (at least to some extent) if students were required to take intermediate microeconomics prior to taking intermediate macroeconomics, as Salemi (1996) suggests. The

majority of economics departments in the US do not require a particular sequencing of intermediate theory courses, however.

[9] We thank Pavel Kapinos for providing us with a detailed account of his approach to the New-Keynesian framework, including sharing some of his challenges in teaching it.

[10] While this list of textbooks is obviously not comprehensive, we chose the most popular textbooks within each of the three approaches.

[11] Of course, categorizing the primary approach that each textbook takes is somewhat arbitrary. Our categorization is based on what we consider to be the central approach taken in each textbook.

[12] Exceptions include Jones (2011) and Barro (2008), who place more emphasis on long-run growth theory.

[13] Mankiw (2010) and Abel, Bernanke, and Croushore (2011) account for approximately one-third and one-fifth of the market, respectively. Estimates for market shares of intermediate macroeconomics textbooks were provided by Pearson Education, Inc., and are for the fall semester of 2010. These data can vary widely across semesters and so should be interpreted as being only broadly indicative of market shares.

[14] In fact, of the textbooks reviewed, Barro (2008), Blanchard (2011), Abel, Bernanke, and Croushore (2011), and Williamson (2011) explicitly advertise their book as one that takes a "unified" or "integrated" approach.

[15] This refers to a chapter in the forthcoming 8th edition of Mankiw (2013).

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TABLE 1: Textbook Approach and Coverage in Intermediate Macroeconomics

| Textbook | *Approach:* Traditional, Micro-founded, Hybrid[a] | *Coverage:* Stylized Macro Facts | Growth Theory | IS-LM, IS-MP, or other | Model of Financial Sector | Dynamic Models | Expectations in Dynamic Models | Liquidity Traps | Financial Crisis | Open Economy Macro | Calibration or Estimation Methods |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Abel, Bernanke, and Croushore (2011) | Traditional | Yes (chaps. 6 & 8) | Yes (chap.6) | IS-LM | No | Yes in AS/AD framework | Yes | Yes (chap.14) | Yes (some examples) | Yes (chap. 13) | No |
| Blanchard (2011) | Traditional | No | Yes (chaps. 10–13) | IS-LM | Yes (chap. 15) | Yes in AS/AD framework | Yes (chaps. 14–17) | Yes (chaps. 22 & 28) | Yes (chap.28) | Yes (chaps. 18–21) | No |
| Barro (2008) | Micro-Foundations (with focus on new-classical) | Yes (scattered throughout text) | Yes (chaps. 3-5) | Policy functions from micro-foundations | No | Yes | Yes (monetary policy) | No | No[b] | Yes (chaps. 17 & 18) | No |
| Carlin and Soskice (2006) | Hybrid (with focus on new-Keynesian macro) | Yes (scattered throughout text) | Yes (chaps. 13 & 14) | IS-LM & IS-PC-MR | No | Yes in AD/AS framework | Yes in AD/AS framework | Yes (chap. 4) | No[b] | Yes (chaps. 9–12) | No |
| Jones (2011) | Hybrid (traditional with micro-foundations) | Yes (chap. 2) | Yes (chaps. 3–6) | IS-MP | No | Some in AD/AS framework | AD/AS with inflation expectations | Yes (chap. 14) | Yes (chaps. 10 & 14) | Yes (chaps. 18 & 19) | No |
| Mankiw (2010) | Traditional | No | Yes (chaps. 7 & 8) | IS-LM | No | Yes (chap. 14) | Yes (chap.14) | Yes (chap.11) | Yes (examples in some chapters) | Yes (chaps. 5 & 12) | No |
| Mishkin (2011) | Hybrid (traditional and some micro-foundations) | Yes (scattered throughout text) | Yes (chaps. 6 & 7) | IS-MP | Yes (chaps. 14 & 15) | Yes in AD/AS framework | Yes (chap. 21) | Yes | Yes (examples in some chapters) | Yes (chap.17) | No |
| Williamson (2011) | Micro-foundations (focus on new-classical) | Yes (chaps. 1 and 3) | Yes (chaps. 6 & 7) | Policy functions from micro-foundations | Some (chap. 9) | Yes | No | Yes (chap.16) | Yes (some applications in most chapters) | Yes (chaps. 14 & 15) | No |

[a]structural with some micro-foundations (neoclassical and/or new-Keynesian)
[b]book published before financial crisis

TABLE 2: Extensions of Intermediate Macroeconomics Models, by Approach

| | *Approach:* | | | | | | |
|---|---|---|---|---|---|---|---|
| Concept | Traditional | | | New-Classical | | New-Keynesian | |
| Bank balance sheet expansion | Blanchard (2011); chap. 28 | Mankiw (2013)[a]; chap. 4 | | | | | |
| Interest rate target/rule | Abel, Bernanke, & Croushore (2011); chap. 14 | Mankiw (2013)[a]; chap. 15 | Mishkin (2011); chaps. 10 & 13 | | | Jones (2011); chap. 12 | Williamson (2011); chap. 13 |
| Credit constraints | | Mankiw (2013)[a]; chap. 16 | | Williamson (2011); chap. 9 | Mishkin (2011); chap. 8 | | |
| Liquidity trap/lower bounds on interest rates | Blanchard (2011); chaps. 22 & 28 | | | Williamson (2011); chaps. 11 & 16 | | Jones (2011); chap. 14 | Williamson (2011); chap. 13 |
| Time inconsistency of policy | | Mankiw (2013)[a]; chap. 18 app | | Williamson (2011); chap. 18 | | | |
| Interest on reserves | Abel, Bernanke, & Croushore (2011); chap. 14 | Mankiw (2013)[a]; chap. 4 | | | | | |
| Fiscal multipliers | Abel, Bernanke, & Croushore (2011); chap. 11 app | Mankiw (2013)[a]; chap. 11 | Mishkin (2011); chap. 16 | Williamson (2011); chap. 10 | | Jones (2011); chap. 11 | |
| Risk premia | Blanchard (2011); chap. 28 | | Mishkin (2011); chap. 15 | Williamson (2011); chaps. 9 & 10 | | Jones (2011); chap. 14 | |
| Illiquid asset/housing market | | Mankiw (2013)[a]; chap. 17 | | Williamson (2011); chap. 9 | Mishkin (2011); chap. 19 | | |
| Flexible inflation expectations | | | | | | Jones (2011); chap. 12 | |

*Note:* This table lists the texts that apply the concept to the closed economy macroeconomic model(s). If the text discusses the concept but does not apply it to the model, it is not listed above. Some of these issues are also addressed in papers referenced in the previous section on theoretical approaches.

[a] Mankiw, N. G. Forthcoming, 2013. *Macroeconomics.* 8th ed. New York, New York: Worth.