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Integrating Macroeconomics and Corporate Finance in Executive Education

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Executive education is increasingly using team teaching and an integrated approach to curriculum development and delivery. We outline one example of how economic policy and basic finance concepts can be connected. Specifically, we utilize a simple model to illustrate the impact that monetary and fiscal policy, via interest rate and tax rate changes, can have on the growth capacity and dividend paying capacity of the firm.

Introduction

Numerous universities, over the past decade, have increased the use of team teaching in delivering executive business education to enhance the educational experience for their students.[1] Integrating the curriculum across the functional areas of business requires educators to collaborate with colleagues outside their discipline, a situation that is likely unfamiliar to most business professors.[2] Two areas "ripe" for integration, as they are closely related, are economics and finance. This paper illustrates a simple, yet important concept that many students fail to grasp when macroeconomics and corporate finance are taught independently; that is, the effects of monetary and fiscal policy on a firm's long-run growth capacity. Stumpf and Tymon (2002) note that many professors teach their areas independently and are reluctant to change their methods. Therefore, this paper can be used as a starting point for professors, particularly those teaching economics and finance, to develop an interdisciplinary approach.

Macroeconomics

A typical foundation course, in an MBA curriculum, in macroeconomics covers monetary and fiscal policy.[3] Students are exposed to the role that the central bank in this country, the Fed, plays regarding control of the money supply, and how monetary policy influences interest rates and hence, economic

activity. Although all the tools available to the Fed are presented in class, generally two policy tools are emphasized: the discount rate, and open market operations.[4] In addition, the federal funds rate is thoroughly discussed, as the Fed has lately seemed to prefer managing this rate, by using open market operations to achieve its objectives[5] (Allen, Bray and Seaks, 1997). As Kennedy (2000) notes, "The advantage to the Fed of focusing on the federal funds rate is that it is determined by supply-and-demand forces and thus is a good indicator of the 'tightness' of current monetary policy insofar as market interest rates in general are concerned."

The impact of monetary policy on economic activity is then illustrated in the following manner. Suppose the Fed wants to "stimulate" economic activity, because of a sluggish economy, and chooses to use open market operations to achieve its objective. By buying bonds, the Fed "injects" liquidity into the banking system.[6] This process increases the demand for bonds, which bids up the price of bonds in the open market and, in turn, increases supply in the loanable funds market, which lowers the interest rate. Banks, now having greater excess reserves, need to borrow fewer funds from Fed member banks resulting in a falling federal funds rate. The additional liquidity in the banking system, excess reserves, spurs additional lending at what are now generally lower interest rates. Lower interest rates increase aggregate demand for goods and services. The transmission mechanism between monetary policy and economic activity is now complete.

Exposure to the expenditure approach for calculating GDP (Consumption Expenditures + Investment Expenditures + Government Expenditures + Net Exports) is a good prologue for discussing the impact of fiscal policy on economic activity. Fiscal policy involves the changing of government spending or taxes through the use of legislation. Since consumption expenditures account for approximately two-thirds of economic activity, and government expenditures account for roughly twenty percent of same, students readily see the impact of changes in either of these components of GDP after some exposure to the concept of the Keynesian multiplier.

Corporate Finance

An introductory corporate finance course, either at the undergraduate or graduate (MBA) level, introduces students to an analysis and understanding of financial information through the use of concepts such as economic value added (EVA), market value added (MVA), and ratio analysis. While ratio analysis can seem daunting, especially in light of the numerous formulas presented, professors typically focus on groups of ratios, i.e. liquidity, asset management, debt management, and profitability and market value, before tying these ratio group relationships together using the Dupont equation. Return on equity expressed in this manner, as (margin x turnover x leverage), allows greater insight into the factors that affect financial performance.

Cost of equity discussions involve, in addition to the CAPM, an introduction to a discounted cash flow approach for estimating a firm's cost of equity. A firm's estimated cost of equity, $\hat{k}_s$, is expressed in the following form:

$$\hat{k}_s = \frac{D_1}{P_0} + g \qquad (1)$$

Where D_1 is the firm's expected dividends over the next year, P_0 is the firm's current stock price, and g represents the firm's expected growth rate into the future. One method of estimating g is the retention growth rate method. As Brigham, Gapenski and Ehrhardt (1999) note, "we first forecast the firm's average future dividend payout ratio and its complement, the retention rate, and then multiply the retention rate by the company's expected future rate of return on equity (ROE):

g = (Retention rate)(ROE) = (1 – Dividend Payout Ratio)(ROE)."

Using this method of estimating a firm's cost of equity allows students to see the inter-connections between expected ROE, dividend policy and growth rates.

Cost of debt (after-tax) concepts, which are generally the easiest for students to comprehend, are then integrated with the more difficult cost of equity concepts to introduce students to the weighted average cost of capital (WACC). An understanding of the WACC is critical for EVA discussions to be fully absorbed by students, i.e. to realize that positive net present value (NPV) projects contribute to a company's economic value in the marketplace.

Institutional Earning Power and Growth Capacity

While the material presented to this point is straightforward, our experience has been that there are some not-so-obvious relationships that students fail to grasp in connecting monetary and fiscal policy to a firm's growth rate or "growth capacity."[7] Correspondingly, we demonstrate an approach for integrating these two subjects by using a bit of algebraic manipulation. We first define a firms' potential growth rate, or as we call it "growth capacity," in the traditional manner:

$$\text{Growth} = (1 - \text{Dividend Payout Ratio})(\text{ROE}) \qquad (2)$$

ROE is then re-written, again along traditional lines, as:

$$\text{ROE} = \frac{\text{Net Income}}{\text{Equity}} \qquad (3)$$

Further de-composition of ROE yields the following series of equations:

$$\text{ROE} = \frac{(\text{Earnings Before Taxes})(1\text{-Tax Rate (T)})}{\text{Equity}} \quad \textbf{(4)}$$

$$\text{ROE} = \frac{(\text{EBIT - Interest Expense})(1\text{-T})}{\text{Assets - Debt}} \quad \textbf{(5)}$$

Where EBIT = Earnings before interest and taxes.

$$\text{ROE} = \frac{(\text{EBIT - (i)(Debt)})(1\text{-T})}{\text{Assets - Debt}} \text{ , i = interest rate} \quad \textbf{(6)}$$

Dividing the numerator and denominator in equation (6) by 'Assets' yields:

$$\text{ROE} = \frac{(\text{BEP - (i)(D)})(1\text{-T})}{1 - \text{D}} \quad \textbf{(7)}$$

In equation (7) BEP= EBIT/Assets and D=Debt Ratio. By plugging ROE from equation (7) into equation (2) a firm's 'growth capacity' can then be written as:

$$\text{Growth} = (1 - \text{Divided Payout Ratio}) \left(\frac{(\text{BEP - (i)(D)})(1\text{-T})}{1 - \text{D}} \right) \quad \textbf{(8)}$$

Expressed in this manner, a firm's growth is dependent upon five factors, some of which are inter-related.[8] Three of the five factors are management determined, i.e. endogenous to the firm, and two of the factors are exogenous. Management determines the capital structure of the company (D), the dividend payout ratio (retention rate), and certainly has an element of control, although not exclusively, over a company's basic earning power (BEP). The two exogenous factors beyond the control of management are the interest rate (i), and the tax rate (T).[9] The effects of monetary policy on the determination of a firm's growth rate become apparent to students as any change in 'i' directly impacts the firms ROE and therefore its growth rate. A simple example illustrates these concepts. With inflation on the rise, suppose the Fed moves to curtail the level of borrowing in the economy. Using open market operations, the Fed sells bonds to reduce excess reserves which results in higher interest rates. Firms now facing higher interest rates, ceteris paribus, experience a lower ROE due to higher interest expenses. Similarly, fiscal policy changes that include tax rate changes (T), ceteris paribus, also directly impact ROE and a firm's growth rate.[10]

Dividend Paying Capacity of the Firm

The dividend paying capacity of the firm can be estimated based on the firm's capital structure and projected growth rate.[11] Starting with equation (8) we can solve for the dividend payout ratio (DPR) as follows:

$$\text{Growth} = (1\text{-DPR})\left(\frac{(\text{BEP} - (i)(D))(1\text{-T})}{1 - D}\right) \quad \textbf{(8)}$$

$$\text{Growth}(1\text{-D}) = (1\text{-DPR})\left(\frac{(\text{BEP} - (i)(D))(1\text{-T})}{1 - D}\right)(1\text{-D}) \quad \textbf{(9)}$$

$$\text{Growth}(1\text{-D}) = (1\text{-DPR})[(\text{BEP}\text{-}(i)(D))(i\text{-T})] \quad \textbf{(10)}$$

$$(1\text{-DPR}) = \left(\frac{\text{Growth}(1\text{-D})}{(\text{BEP}\text{-}(i)(D))(1\text{-T})}\right) \quad \textbf{(11)}$$

$$\text{DPR} = 1\text{-}\left(\frac{\text{Growth}(1\text{-D})}{(\text{BEP}\text{-}(i)(D))(1\text{-T})}\right) \quad \textbf{(12)}$$

As was the case with growth capacity, a firm's dividend payout ratio, or capacity, is also dependent upon five factors. Again, three of the five factors are related to management, although one of the three factors is influenced by a combination of management decisions and the marketplace. Management determines the capital structure of the company (D), and has an element of control, although not exclusively, over a company's basic earning power (BEP). The "growth" of the company is influenced by management decisions e.g., R&D, etc., and affected by the decisions of competitors in the marketplace. The interest rate (i), and the tax rate (T) remain the two exogenous factors, beyond the control of management. Given a constant rate of growth, stable basic earning power, interest rates and taxes, the dividend paying capacity of a firm can be estimated based on a firm's capital structure.

The effects of monetary and fiscal policy on the determination of a firm's growth rate, or capacity, and dividend payout ratio are both affected by changes in "i" and "T", which students quickly realize upon breaking down these simple equations.

Conclusion

In this paper, we have demonstrated a simple yet effective approach for integrating elements of macroeconomics and corporate finance in the classroom. The marketplace for executive business education, which seeks to bring students with non-business degrees "up to speed" rapidly in the various functional areas, is driving the pace of change in instruction, integration, and delivery methods. This application is one of the many cases that demonstrate the effectiveness of integrating subject areas. Those business programs and professors, who embrace this change and integrate material across disciplines, will find that this approach yields a richer educational experience for both faculty and students.

Notes

[1]For a history of executive education and its development see Crotty and Soule (1997), Deconinck and Steiner (1999), Conger and Xin (2000), and Moodie and Roebuck (2002).

[2]Porter and McKibbin (1988) report that most undergraduate programs are taught as separate functional areas, but Geiger et al (2000) and Bliss et al. (2000) discuss new programs at the University of Idaho and Babson College where the business curriculum is being integrated.

[3]Most MBA curriculum requires a managerial economics course heavily based in microeconomics and price theory. These are subjects that most students can integrate into a financial analysis of the firm. To the extent that macroeconomic issues are addressed in this course, monetary policy and fiscal policy are typical topical areas.

[4]A third policy tool is the required reserve ratio, but students are instructed that most monetary policy actions are conducted through open market operations as specified by the Federal Open Market Committee.ww

[5]The federal funds rate is a market determined interest rate that banks charge one another for short-term loans, usually overnight. Allen, Bray and Seaks (1997) note that Fed chairs have proceeded very differently when implementing monetary policy.

[6]Short-term T-Bills are the primary instrument used in this transaction.

[7]Students fail to grasp these concepts in part because professors do not present them in an integrated fashion. While many articles have been written on how to improve the pedagogy of finance and economics separately, a review of the literature reveals that little has been written to show how to integrate these subjects. Kline and Janicki (2003) address assignments that could be used in finance and economics courses. Dale (2004) indicates that improvements could be made to better relate economics to other business disciplines. In this regard, our analysis contributes to the literature for both undergraduate and executive education.

[8]This is an over-simplification to illustrate important and related concepts. In class, it is always stressed that a firm's "opportunities" in the marketplace, and whether management capitalizes on those opportunities, is an enormously important factor affecting growth.

[9]It is pointed out in class that management has some control over the interest rate by their choice of capital structure but for the most part the interest rate is exogenous. In addition, a firm's "effective" tax rate can be somewhat "managed" but this again is mostly an exogenous factor.

[10]Changes to corporate tax rates, and capital gains taxes may impact a firm's growth rate, and personal income tax rates may affect small business growth.

[11]This assumes a constant growth rate in earnings going forward as well as a constant relationship between sales and assets, i.e. each additional dollar of sales requires a constant proportional increase in assets to support those sales.

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