Some Thoughts on the External Finance Premium and the Cost of Internal Finance

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Abstract

We draw a conceptual distinction between the cost and the opportunity cost of internal finance, the latter being an integral part of the definition of the external finance premium in the literature. We come up with an operational definition of the cost of internal finance and calculate its differential with the cost of external finance. We further delve into the concept of the equilibrium real interest rate and measure it in terms of the cost of internal finance as the rate that would prevail in the long run after temporary shocks in the economy have died out.

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1. Introduction

The external finance premium is a key concept in the operation of the balance sheet channel of monetary policy transmission. This premium is the difference between the cost for firms of raising finance from external and from internal sources respectively; its existence signifies that these two types of finance are imperfect substitutes. If, on the other hand, internal and external finance were perfect substitutes, this would mean that any temporary differences in the cost of finance from these two sources would be arbitraged away and the Modigliani-Miller irrelevance proposition would hold. Somewhat surprisingly, the literature, including the paper that established the concept of the external finance premium (Bernanke and Gertler 1989, pp. 24-5), defines this premium as the difference between the cost to borrowers of raising external finance and the opportunity cost of using internally generated funds, which is not the same as the cost of internal finance. When the cost of internal finance is defined in the ambiguous sense of the opportunity cost, internal funds are thought to have a cost advantage over external finance (Bernanke 2007, p. 3). In this paper, we focus on the concept of the cost of internal finance and come up with an operational definition that distinguishes it from the opportunity cost of internal finance but also from the cost of equity capital, given that equity capital constitutes an external source of corporate finance. Specifically, we use the return on retained earnings to firm owners in order to measure the cost of internal finance. With the cost of internal finance properly defined, the external finance premium can no longer be characterized as a "premium" but is rather a cost differential between external and internal finance. As such, it still retains the countercyclical property of the external finance premium as defined in the literature, and can also be shown to be part of the specification of a financial accelerator mechanism similar to the one described by Bernanke et al. (1999).

The definition of the cost of internal finance in this paper brings us to another issue, seemingly unrelated to that of the external finance premium, namely the measurement of the equilibrium real interest rate. This issue has gained importance over the past decade when real interest rates showed an unprecedented decline after the global financial crisis of 2008-2009 and reached levels not seen before. Interest in the equilibrium rate derives from the fact that this rate provides a benchmark for measuring the stance of monetary policy; policy is expansionary (contractionary) if the short-term real interest rate is lower (higher) than the equilibrium rate (Holston et al. 2017, p. S59).[1] However, the equilibrium real interest rate is a variable not directly observed and its measurement has proven a difficult task. This is

[1] With central banks also intervening in the longer end of the yield curve in order to provide monetary policy accommodation and with short-term rates bounded by an effective lower bound, short-term real rates are no longer considered to be sufficient summary measures of monetary conditions. To address this, the concept of "shadow rates" has been introduced (see Black 1995; Wu and Xia 2016).

particularly relevant today when the equilibrium rate has declined so much and the question whether the decline is permanent or not has arisen (Williams 2017b, p. 2).

Analysis based on US data endeavoring to estimate the equilibrium real interest rate is either based on single-variable methods or is model-based. The former focuses on long-run or steady state values, examining the behavior of the real interest rate over long periods of time (e.g. Hamilton et al. 2016, p. 661). The interest rate is usually the rate on riskless assets, although some studies called for the use of interest rates on risky assets (e.g. Cukierman 2016, p. 13). Model-based studies use theoretical frameworks that are generally characterized by the absence of financial frictions, as in the case of various versions of the New Keynesian model. A popular model in this category of studies is the Laubach and Williams (2003, 2016) model. In this paper, we follow the first approach to measure the equilibrium real rate, which is based on our definition of the cost of internal finance. The main idea is that the equilibrium real interest rate expressed in terms of the cost of internal finance can be obtained from the long-run static model that corresponds to an otherwise standard dynamic macroeconomic model, for instance a New Keynesian type of model, extended to include financial market frictions. This rate can be considered as the hypothetical (real) cost of internal finance that would prevail in the long run after temporary shocks affecting the economy have died out. We show that this measure of the equilibrium real rate is equal to the ratio of the depreciation flow, i.e. the amount of earnings required to finance capital consumption in equilibrium, to the stock of retained earnings.

Section 2 discusses in depth the external finance premium as encountered in the literature, develops the concept of the cost of internal finance, and calculates the cost differential between external and internal finance. Section 3 extends the methodology used to define the cost of internal finance in order to derive a measure of the equilibrium real interest rate in terms of the cost of internal finance, and makes some comparisons with existing estimates. Finally, Section 4 concludes.

2. Facts and fallacies about the external finance premium

The concept of the external finance premium introduced by Bernanke and Gertler (1989) is central to the analysis of the balance sheet channel of monetary policy transmission.[2] Credit market, or, more generally, capital market imperfections, give rise to a difference between raising funds from external sources of finance (i.e. through loans, bonds or equity) as opposed to internal sources (i.e. through retained earnings). The cost differential is referred to as the external finance premium. According to Bernanke and Gertler (1995), agency costs

[2] A recent reformulation of the bank lending channel (Bernanke 2007, p. 5) posits that the external finance premium plays also an important role in monetary policy transmission through this channel, for banks who manage their liabilities.

underlie the external finance premium. For example, lenders cannot observe without cost the returns of the investment projects they finance but must incur a fixed audit or monitoring cost to observe those returns; in this respect, the "costly state verification" represents an agency cost. The fact that borrowers have better information about the characteristics of their projects or the ability to take unobserved actions that can affect the nature of the risk involved and its impact on the projects' returns can increase agency costs.

The notion of agency costs is basic to the analysis of the relationship between the external finance premium and the firm's net worth.[3] Thus, due to agency costs, a lower net worth worsens the terms under which firms are able to raise external finance and also increases the external finance premium, which is in this way negatively related to net worth. This, in turn, implies a reduction of the net return to investment (Bernanke and Gertler 1989, p. 26). Many studies define the external finance premium as the difference between the cost of external finance and the opportunity cost of internal finance (e.g. Bernanke and Gertler 1989; Serven and Solimano 1992; Bernanke and Gertler 1995; Bernanke, Gertler and Gilchrist 1999), which is not the same as the cost of internal finance. Thus, there is a conceptual problem concerning the definition of the external finance premium. Later we shall try to address this problem by specifying the cost of internal finance not in the ambiguous sense of the opportunity cost.

The existence of a non-zero cost differential between internal and external finance implies that these two types of finance are not perfect substitutes. This differential arises due to financial market frictions or more generally capital market frictions. These frictions emerge when perfect trade in certain markets cannot take place (Quadrini 2011, pp. 213-4). The idea is that markets are incomplete because parties are not willing to engage in certain trades because there is limited enforcement of contractual obligations for reasons such as information asymmetry. This is an agency problem. For example, the information asymmetry limits the ability of shareholders of a firm to force corporate management to maximize the firm's net worth when this management uses retained earnings to finance investment projects of low expected returns.

If internal and external financing were perfect substitutes, the Modigliani-Miller theorem would hold, and the capital structure would be irrelevant for investment decisions as it would not matter whether acquisitions of capital are financed by entrepreneurial wealth (net worth) or borrowing: the cost of financing from different sources would be the same. If, however, different types of finance are imperfect substitutes, the firms would face a differential cost

[3] Bernanke et al. (1999, p. 1345) specify net worth as the "borrowers' liquid assets plus collateral value of illiquid assets less outstanding obligations". Operationally, Bernanke and Gertler (1995, p. 35) define it "as the sum of liquid assets and marketable collateral".

when raising finance from different sources. Moreover, capital investment decisions and capital structure decisions would no longer be unrelated.

The ambiguity regarding the definition and measurement of the external finance premium is reflected mainly in two aspects. First, external finance is asserted to be virtually always more expensive than internal finance, which involves internally generated cash flows, because lenders incur costs of evaluating borrowers' prospects and monitoring progress regarding the implementation of investment projects (Bernanke 2007, p. 3). Thus, the external finance premium is generally positive. Second, a number of indicators are used for the measurement of the external finance premium. Gertler and Lown (1999) use for the US the spread between the high-yield corporate bond rate and the corresponding rate for the highest quality firms (AAA rated) or the rate on ten-year Treasury bonds. Similarly, Mody and Taylor (2004) measure the external finance premium as the difference between the Merrill Lynch high yield bond index and the 10-year government bond yield. Krylova (2016) constructs various corporate bond spread indices, and also spreads between lending rates, for firms with different credit qualities, for the euro area and five major European economies. Recourse to indicators or proxies for the external finance premium reflects the view that it is difficult to obtain direct measures of the premium (Bernanke and Gertler 1995, p. 46). Some authors go as far as to say that the external finance premium is unobservable (e.g. De Graeve 2008, p. 3415). Gertler and Lown (1999) qualify the view that the premium for external funds is not easy to measure by noting that plausible indicators for this premium should preferably be market determined: until the development of the market for high yield debt in the US, such indicators did not exist, while the only available interest rate to use in aggregate time series analysis for borrowers who traditionally rely heavily on commercial banks for external finance is the prime lending rate, which is a posted rate. However, possible measurement problems surrounding the external finance premium do not invalidate in any way the conceptual distinction that was drawn here between the cost and the opportunity cost of internal finance.

How, then, is the cost of internal finance going to be properly defined and measured? To address this question, we recall that retained earnings is that part of net cash flow generated by a firm's past investments that is retained within the firm rather than being distributed to shareholders as part of the dividend flow. Because retained earnings arise from sources internal to the firm, rather than external sources such as new equity issues, there is a temptation to believe that this source of finance is somewhat costless. In fact, retained earnings belong to the shareholders of the company and so the cost of retained earnings or, alternatively, the return these earnings are expected to generate should be related closely to the return required by shareholders on new equity. We can now define the cost of retained earnings by noting that this cost is really the return on retained earnings (whether we choose to call it a "cost" or a "return" is a matter of perspective). The return on retained earnings in a given period can be seen to have two components (see Table 1): (a) the flow of retained earnings (ΔRE) in the period, where RE is the stock of retained earnings, and (b) the depreciation flow, i.e. the amount of earnings required to finance capital consumption of the period (DEP). The latter are already deducted from accounting measures of net earnings and therefore need to be added back to the flow of retained earnings as they represent the minimum return the firm, as a going concern, has to deliver in order to maintain its physical capital stock in operation. The sum of these components as a percentage of retained earnings gives the (real) cost of retained earnings for the firm:

$$\varphi = (DEP + \Delta RE)/RE \qquad (1)$$

Given the cost of retained earnings φ, firms make their financial decisions on the basis of their relative capital structure. It is useful at this point to reiterate that if internal and external finance were perfectly substitutable, the capital structure would be both indeterminate and irrelevant to real decisions. The cost of capital would be the same regardless of the financing method. When, however, we allow for capital market imperfections, the question of investment financing is relevant, and a number of factors should be considered when evaluating different sources of finance. Whatever the outcome, it is difficult to identify in a simple way the optimal capital structure. This should not detract us from the fact that, with a changing capital structure, two interrelated decisions are involved: a capital investment decision and a capital structure decision. To illustrate this, we note that the stylized model proposed by Bernanke and Blinder (1988) for analyzing the bank lending channel and estimated for six major economies by Brissimis and Magginas (2005)[4] explicitly incorporates the interdependence between changes in financial structure and investment demand (and thus output demand).

[4] Bernanke and Blinder (1992) did not attempt a structural estimation of their model but instead applied a VAR model to US data to examine the impulse responses of a number of macroeconomic variables to an innovation in the Federal funds rate.

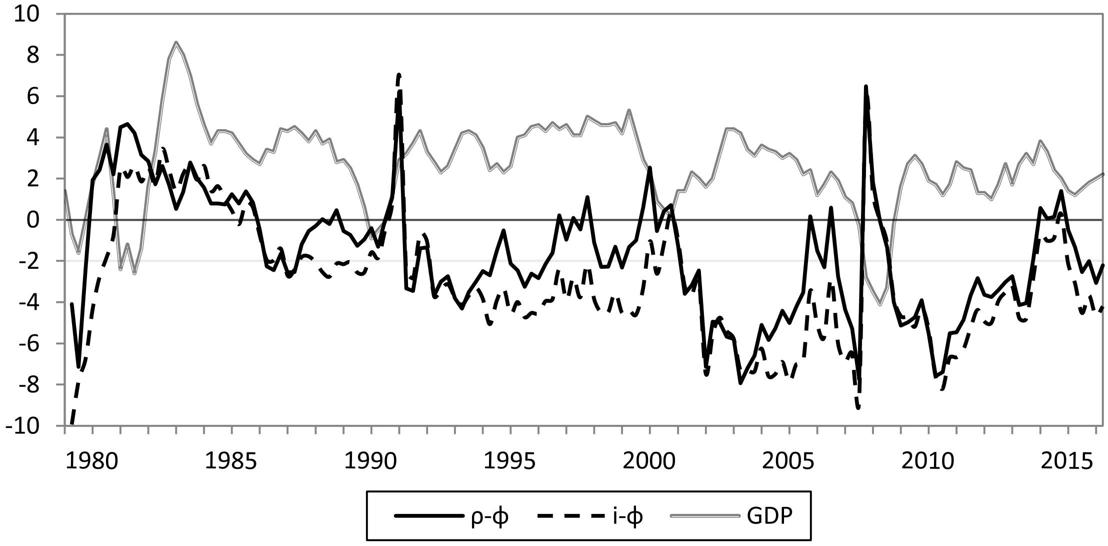
Table 1 Firm's capital structure

Type of finance	Provider of finance	Cost of finance/ Rate of return (real)	Borrower
Internal finance			
Retained earnings (RE)	Stockholders/ Firm owners	(DEP + ΔRE) / RE	Management/Firm
External finance			
Equity (E)	Stockholders/ Firm owners	DIV / E	Management/Firm
Loans (L)	Banks	i^L - Δp	Management/Firm
Bonds (B)	Bondholders	i^B - Δp	Management/Firm

Note: Definition of variables: *DEP*: depreciation (flow); *RE*: retained earnings (stock); *Δ*: first-difference operator; *ΔRE*: retained earnings (flow); *DIV*: dividends; *E*: stockholders' equity; i^L: bank lending rate; p: price level (log); i^B: bond rate.

With a mixed capital structure, where all forms of capital are held in varying proportions, it is the weighted cost of capital that affects real investment decisions of firms. On the other hand, the internal and external financing mix depends inter alia on the differential cost of different sources of finance. Figure 1 below shows the evolution of two alternative measures of this relative financing cost. One is the spread between the real bank lending rate and the (real) cost of retained earnings as specified above (eq. 1) and the other is the spread between the real bond rate and the above cost of retained earnings. Both spreads mostly take negative values, with the exception of the four US major recessions in the last forty years: the 1981-1982 recession, the recessions of the early 1990s and early 2000s and, finally, the Great Recession of 2008-2009. Thus, these differentials could hardly be characterized as 'premia' on internal finance. They would rather represent cost differentials between external and internal finance.

Figure 1: Cost differentials and GDP growth (1980Q1-2017Q2)



Note: GDP: real GDP growth rate (annual %), ρ-φ: real cost differential between loans and retained earnings, i-φ: real cost differential between bonds and retained earnings.

Source: FRED and QFR databases and authors' calculations.

However, both the external finance premium as defined in the literature, and the cost differential between external and internal finance as specified in this paper, share a common feature. Specifically, they both display countercyclical behavior. In our setting, an increase in the cost of internal finance relative to that of external finance lowers, ceteris paribus, the demand of firms for retained earnings and, to the extent that these retained earnings are procyclical, the cost differential between external and internal finance will be countercyclical. The countercyclical behavior of the cost differential is evidenced in Figure 1, which shows, together with the two measures of the cost differential, the annual growth rate of GDP. Furthermore, the procyclicality of firms' retained earnings, which is partly associated with countercyclical variations in the above cost differentials, is expected to lead to the operation of a financial accelerator mechanism similar to that described by Bernanke, Gertler and Gilchrist (1996, 1999).

3. Measuring the equilibrium real interest rate in terms of the cost of internal finance

A useful extension of the logic used in this paper to define the cost of internal finance would be to follow an alternative methodological approach in order to derive a measure of the equilibrium real interest rate based on asset returns data. The equilibrium real interest rate (or natural rate of interest) is usually defined as the real interest rate that is consistent with full utilization of resources in the economy and price stability. It is often measured as the hypothetical real rate that would prevail in the long run once all of the shocks affecting the economy die out (Fischer 2016, p. 1). The long run is a period of sufficient length to enable all markets to clear, and to allow all variables in the economy to settle at constant levels in the absence of new economic disturbances. Thus, in long-run equilibrium, the economic system must satisfy the condition that all variables should be time invariant, i.e. stocks should remain constant and flows should perpetuate themselves at the same level. Equation (1) will be the starting point for calculating the equilibrium real interest rate. In equilibrium, this equation becomes:

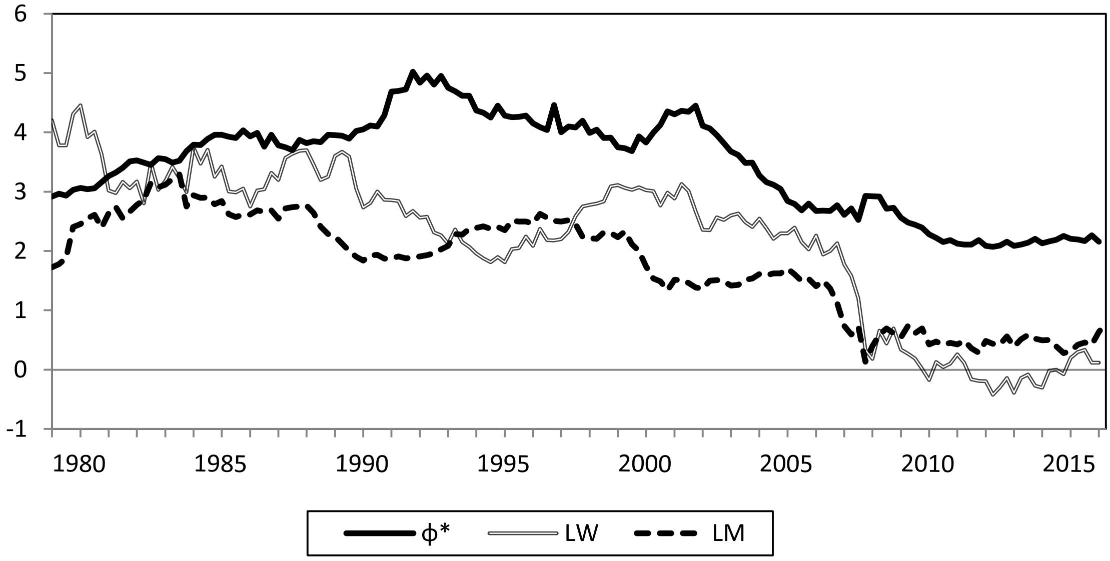
$$\varphi^* = DEP/RE \tag{2}$$

since equilibrium implies that the stock of retained earnings remains constant and there is no flow of retained earnings. The intuition behind equation (2) is that in the stationary state, there are additions to capital in each period, which are balanced by an equal consumption of capital (depreciation), so that the stock of capital remains fixed.

In equation (2) we focus on the steady state values of the real interest rate, by examining the behavior of the (real) cost of internal finance variable over a period which, as indicated, is sufficiently long (actually it extends to infinity) to allow the effects of shocks to die out. Cukierman (2016) suggested that increasing attention should be paid to the long-term risky interest rate and therefore to the natural counterpart of this rate, since existing estimates of the natural rate, which are based on riskless assets, are likely to be biased downward. Also, Hamilton et al. (2016) state that the equilibrium real interest rate based on the federal funds rate is distinct from the equilibrium real rate of return on business capital, equities, long-term government debt, or short- or long-term consumer or corporate debt, although those returns are expected to be related to the equilibrium real federal funds rate.

If we were to follow a model-based approach in order to obtain a measure of the equilibrium real interest rate, the model would probably have to be an otherwise standard macroeconomic model extended to include financial market frictions. The models used to analyze the equilibrium real interest rate are mostly based on the New Keynesian paradigm. This type of model, however, suggests that we are in a Modigliani-Miller world where markets are complete and the financial structure does not matter – it is in fact indeterminate. The only interest rate that is defined in such a model is that on monetary assets. However, research, especially after the financial crisis, has shown that the complete markets assumption has some limitations and should be modified to take into account a changing financial structure.

Figure 2: Equilibrium real interest rates



Note: φ*: equilibrium real interest rate based on eq. (2), LW: the Laubach and Williams (2016, updated) real equilibrium real interest rate, LM: the Lubik and Matthes (2015, updated) equilibrium real interest rate.

Source: Laubach and Williams (2016) and Lubik and Matthes (2015) estimates; QFR database and authors' calculations.

In Figure 2 we plot the equilibrium real rate computed from equation (2) for the period extending from 1980 through the second quarter of 2017. The time evolution of the series shows a declining trend from a high of 5 percent in the early 90s toward values hovering around 2 percent in the more recent period. This pattern is consistent with the decline of the equilibrium real interest rate estimated in other studies.

Is it reasonable to suggest that the equilibrium real interest rate has declined in the above period? Summers (2014) discussed a number of factors that may have contributed to the decline in the equilibrium real interest rate. One such factor may be the reduction in demand for debt-financed investment following a period of excessive leverage. Another factor is the increase in corporate retained earnings, which led to an increase in the level of savings. Furthermore, the persistent slowdown in productivity growth, combined with demographic shifts, may have led to slower growth in potential output. Future slow growth discourages current investment and, on the other hand, may provide to households an incentive to increase saving (Liu and Tai 2016, p. 1). The larger supply of funds available through savings and the lower demand for funds to use for investment seem to operate in the direction of a lower equilibrium real interest rate.

Figure 2 also shows for comparison two other measures of the equilibrium real interest rate (federal funds rate) from two studies that employ model-based methods to estimate this rate. The Laubach and Williams (2016, updated) study relies on a small-scale empirical model that has some underpinnings in the New Keynesian model of the economy. The Lubik and Matthes (2015, updated) study, on the other hand, takes a less structural approach by applying a time-varying VAR model to the data. A common finding in these studies is that the equilibrium real interest rate shows a downward-sloping trend reaching in recent years a level not seen in decades. Also, a notable finding of the second study is that the estimate of the equilibrium rate never turns negative, while in the first study this rate entered negative territory in the early 2010s. However, given the considerable uncertainty surrounding the two estimates, any observed differences between the two series are hardly significant (Lansing, 2016, p. 1). If we further compare these two estimates with our measure of the equilibrium real interest rate φ^* (eq. 2), the first thing we notice is that our series is uniformly higher than the other two, the difference between them being around 2 percent in the last seven years. We should stress that, along the lines of Cukierman (2016) and Hamilton et al. (2016), our measure should be seen as referring to the equilibrium risky rate, which presumably explains why it is higher relative to the above two measures of the equilibrium rate. Estimates of a similar order of magnitude to ours, at least for the most recent period, were derived by Taylor and Wieland (2016), who extended the period of estimation of the Smets and Wouters (2007) New Keynesian DSGE model of the US economy to the present and reported a value of the long-run equilibrium rate of interest that is somewhat above 2 percent. They suggested that the Laubach and Williams (2016) estimates are downward biased because some key determinants are omitted from their estimating equations and also their model does not include a financial sector, its omission being of no less importance.

Given the variety of factors that have pushed the equilibrium real interest rate to a very low level, the question is whether we have moved to a permanently lower long-run level, since to date there are no signs of a return to historically more normal levels. Williams (2017b) argued that the factors responsible for the decline of this rate appear poised to stay that way. The major one is that the growth rate of potential output has slowed down to around 1.5 percent, reflecting sharp declines in labor force growth and lower productivity growth. The low estimates of the equilibrium real interest rate have not been influenced solely by US-specific factors but instead longer-term global influences are at work affecting the global supply and demand for savings (Williams 2017a; Holston et al. 2016).

The broader implication of the permanently lower equilibrium real interest rates is that monetary policy has not much room to stimulate the economy in downturns of the cycle and there is need to rely more heavily on unconventional measures keeping interest rates very low for a long time (Williams 2017b; Reifschneider 2016).

4. Conclusions

The external finance premium, defined as the difference between the cost of capital raised by firms from external sources and of capital raised internally, plays a distinct role in the operation of the balance sheet channel of monetary policy transmission and of the financial accelerator mechanism enhancing monetary policy effects. However, as pointed out in this paper, there is a conceptual problem, which has not been brought out in the relevant literature regarding the definition of the external finance premium, namely that the cost of internal finance in that definition is convoluted with the opportunity cost of internal finance, which is not the same as the cost of internal finance. In this paper, we drew that distinction and specified the cost of internal finance as the (real) return on retained earnings to firm owners, which is a cost if viewed from the firm's side. When the external finance premium is rightly measured as the cost differential between external and internal finance, it can hardly be called a premium on internal finance. However, this measure is seen to retain the countercyclical property of the external finance premium as defined in the literature, and its role in a financial accelerator mechanism is similar to the one proposed by Bernanke et al. (1999).

Further, our paper has dealt with the notion of the equilibrium real interest rate and proposed a new measure for this rate based on our definition of the cost of internal finance. This measure is the hypothetical real rate that would result in the long run after all markets in the economy have cleared and all variables have settled at constant levels in the absence of new economic shocks. In line with other estimates of the equilibrium real interest rate, our measure is found to display a declining trend since the early 90s and reach a low level around 2 percent in the past decade, but to remain consistently higher than the popularized Laubach-Williams (2016) estimate. If we were to use a model-based approach for estimating the equilibrium real interest rate, a model structure that would give us the new defined measure of the equilibrium rate--as well as its relationship to other equilibrium real rates of return, such as those on short-term monetary assets, equities or corporate debt--would be one in which the complete markets assumption is relaxed and financial market imperfections are admitted.

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