



The relationship between growth and profit: evidence from firm-level panel data



Sanghoon Lee*

Department of Economics, Hannam University, 70 Hannamro, Daedeokgu, Daejeon 306-791 Republic of Korea

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ABSTRACT

This paper examines the firm-level panel data of Korea to identify the relationship between growth and profit. Both static and dynamic panel data regressions are used by applying fixed effects and generalized method of moments (GMM) methods. In addition, non-linear regressions, LAD regressions, and split-sample regressions are employed. The empirical analysis finds that profit affects growth negatively, but growth affects profit positively. The negative effect of profit on growth has not been reported previously. We interpret the result to imply that institutional environment has effects on the relationship between firm growth and profit. Another noteworthy finding is that the effect of growth on profit is found to be positive only in the case of old firms, not in the case of young firms.

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1. Introduction

Is the relationship between firm growth and profitability positive or negative? As discussed in the next section, theoretical discussions lead to contradictory conclusions. Some argue that a trade-off exists between profit and growth and thus one can expect a negative relationship between them. Others believe that profitability and growth are mutually supportive. In the face of conflicting opinions, it is left to empirical studies to determine whether the relationship is positive or negative. Thus, in this article, we empirically examine the growth/profit relationship.

This study investigates firm-level panel data of South Korea (hereafter called Korea). Most previous studies have used data from advanced nations, such as US and EU countries. The data employed for this study is from the newly

developed country and thus provide insight into ascertaining if the growth/profit relationship depends on national context. As active investment is necessary for firm growth, the effect of profit on growth is likely to be positive in an environment that is conducive to investment and growth. If the business environment is not favorable to investment, the causal link of profit to growth is weak. Korea has not provided a strong institutional setting for investor protection (see [John et al., 2008](#)). Moreover, economy-wide reforms have been implemented in Korea since the Asian financial crisis in 1997, which would push managers to concentrate on profit goals at the expense of firm growth. Thus, the effect of profit on growth is not likely to be positive in Korea.

This paper offers three contributions to the empirical literature. First, we use both static and dynamic panel estimators by applying fixed effects and generalized method of moments (GMM) methods with the aim to get robust empirical results. The use of both static and dynamic estimators has not been adopted in previous work. Second, we employ nonlinear regressions such as quadratic regression

* Tel.: +82 42 629 7614; fax: +82 42 672 7602.

E-mail addresses: sanghoonlee@hannam.ac.kr, sanghoonlee@yonsei.ac.kr

and piecewise linear regression in order to examine the possibility of a nonlinear relationship between growth and profit. Nonlinear relationships may lead to mixed empirical results in existing research, but most studies do not consider nonlinear models. Third, we consider the moderating role of firm age. To check this, split-sample regressions based on firm age are performed. Even though the relationship between growth and profit may differ depending on the stage of maturity, previous studies do not examine the role of firm age.

2. Literature review

Profit maximization is one of the most common hypotheses in the traditional theory of the firm. Most microeconomics textbooks mention profit maximization as the firm's objective. However, 'managerial theories' criticize that managers want to maximize the growth of the firm (e.g., see Baumol, 1958; Marris, 1964; Penrose, 1959). Managerial objectives can be sales revenue maximization (Baumol, 1959) or balanced rate of growth (Marris, 1964). Similarly, the corporate governance literature claims that managers have incentives to pursue their own interests by increasing size rather than profit. Currently, many economists and organizational theorists accept that profit maximization and growth are the two competing goals of the firm. Given that it is difficult for managers to simultaneously pursue both goals, they are oriented toward either profit or growth, but not both. Accordingly, there is a trade-off between profit and growth. This leads to the hypothesis on negative relationship between profit and growth.

The hypothesis of negative relationship is broken down into two sub-hypotheses: the negative effect of profit on growth and that of growth on profit. Profit-oriented managers often choose to forgo growth opportunities to maintain high levels of profit. In this case, high profits are obtained as a result of profit-focused management at the expense of growth. On the other hand, growth can hinder profitability, because expansion of projects often takes managerial focus away from profitability. Rapid growth accelerates the pace of organizational complexity, which becomes a challenge to managers (Arbaugh and Camp, 2000; Smith et al., 1985). That is, as a firm gets larger, improving profitability becomes much harder to management. Traditional microeconomic theory also assumes that firms undertake the most profitable projects first and then continue to expand into less and less profitable ones, leading to decreased profitability due to growth (Steffens et al., 2009, p. 132).

Refuting the foregoing hypothesis, some argue in favor of a positive link between profit and growth. First, profits can lead to expansion. The evolutionary principle of "growth of the fitter" (Coad, 2007) suggests that profitable firms grow. According to Alchian (1950), profit realization is the criterion according to which successful firms are selected, and those who realize positive profits grow. In the pecking order theory suggested by Myers and Majluf (1984), firms prefer internal finance to external finance for their investments because of asymmetric information between the firm and outside investors. An increase in retained earnings leads to an increase in investment and

consequently to further expansion. That is, profit is the important source of finance for expansion.

Second, growth can generate opportunities to foster profitability. This argument is often based on scale economies, first mover advantages, network externalities, and experience curve effects (Steffens et al., 2009). Cost reduction via scale economies can improve firm profitability (Gupta, 1981). Access to distribution channels, as well as securing favorable contracts with suppliers and buyers, can lead to more profitable prices (Markman and Gartner, 2002). In addition, firms "learn over time how to produce more efficiently" and "periods of growth appear to be important opportunities for learning" (Coad, 2007, p. 384).

The moderating role of firm age is relevant in this regard. As the competitive advantages obtained from growth are hard to be achieved by young firms, positive impact of growth on profit is more likely in established firms, which can take greater advantage of the effects than in young firms. If young firms cannot take advantage of scale economies, experience curve effects, and other related factors, they might not be able to relate growth to profitability. For example, experience curve effects may not play a significant role in the management of young firms, because the effects can create entry barriers by bringing substantial cost advantages to established entrants (Spence, 1981). Furthermore, high growth may cause problems to young firms. As high growth leads to increased structural complexity, younger and growing firms may encounter more challenges than do their older counterparts that have more specialized management teams. Rapidly growing firms need to advance beyond the "intimate and cohesive entrepreneurial ventures", but young firms "have not yet become secure, stable entities" (Hambrick and Crozier, 1985).

As discussed, growth and profit are assumed to substitute for or complement each other depending on the theories. What about empirical evidence? There are several, but not many, empirical studies that examine both the effect of profit on growth and the effect of growth on profit by examining firm-level data. Cowling (2004) uses OLS and 2SLS regression techniques to examine a UK firm data set for three years (1991–1993), and finds that growth and profit facilitate each other. By employing dynamic panel VAR model of GMM and cross-sectional model of OLS, Goddard et al. (2004) investigate accounts data for 583 European banks to show that current profit is a prerequisite for future growth, but current growth can cause future profits to fall. Jang and Park (2011) use a dynamic panel GMM approach and provide evidence that prior profit rates have a positive effect on current growth rates, but prior growth rates have a negative effect on current profit rates. This result, however, may not be generalized because the study investigates restaurant firms only.

Of particular interest is a series of empirical studies conducted by Alex Coad and his colleagues. Coad (2007) examines panel data of French manufacturing firms with 20 employees or more, and the empirical result indicates that profitability is not the driver of firm growth and that past growth has a positive influence on the subsequent profit rate. He uses OLS, fixed effects (FE), and GMM estimators to examine the effect of profits on growth, but uses OLS and FE

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