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March 2005

Banking competition and capital accumulation: the importance of how profits are returned[1]

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Abstract

We consider the effects of an imperfectly competitive banking sector on the capital stock in a version of the two-period Diamond OLG model, focusing on how profits are returned. There are two broad alternatives: profits may be taxed and returned to households exogenously as fiscal transfers or endogenously as untaxed dividend payments to the (old) holders of bank equity. Returning bank profits to the old, either exogenously or endogenously, unambiguously reduces the capital stock, but through two distinct mechanisms. If bank profits are returned to young, the capital stock may be higher than under perfect competition where the interest elasticity of savings is sufficiently low.

[1] I thank Mike Bleaney for comments. I am responsible for any remaining shortcomings.

1. Introduction

Recent research has considered the capital accumulation effect of market concentration in the banking sector. Reviews of the theoretical literature [Guzmann (2000) and Cetorelli (2001)] show that the overall effect tends to be ambiguous, because of conflicting mechanisms. On the one hand, the rent-seeking activities of monopolistic institutions may reduce deposit interest rates and, thence, saving and capital accumulation [Pagano 1994].[3] On the other hand, monopolistic banks may be better able to cope with the problems presented by asymmetric information. This is the case with free-rider problems that arise where the screening of prospective borrowers is costly as in Petersen and Rajan (1995).

There are other factors that lead to an ambiguity in the overall effect. Caminal and Matutes (2002) argue that moral hazard problems may also be alleviated by banks with market power, which are more inclined to monitor established borrowers. Furthermore, higher concentration ratios may allow for larger profits as buffers against external shocks and reduce the risk of insolvency. There may be more saving, for given interest rates, with fewer banks inasmuch as confidence in solvency is a basic requirement of depositors.[4] Deidda and Fattouh (2005) also consider a different kind of trade-off relating to banks' operating costs. Banks incur fixed costs plus transaction costs that may be reduced by specialisation in dealing with fewer customers. The social cost advantage of a monopoly bank is that only one fixed cost is incurred for the whole economy, but there is a cost disadvantage of having to deal with all the economy's borrowers.

The present paper uses the framework the Diamond (1965) two-period overlapping generations model in order to focus on an issue that is relevant to general equilibrium and one that is generally overlooked: how bank profits are returned to the household sector. This issue can be avoided by various devices: profits may be consumed by the banks themselves, they may be taxed and spent on wasteful government expenditure or, in the case of a small-open economy, expatriated. The purpose of this paper is to

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[3] Pagano (1993) also relates there is no conclusive evidence of a positive interest rate effect on saving.

[4] Arguably, deposit insurance also encourages this kind of confidence.

demonstrate that, if profits are returned to households, the way in which they are returned critically affects the analysis of the relationship between banking competition and capital accumulation.

Although there are other possibilities for returning profits, we consider just two polar possibilities where bank profits are returned either (a) exogenously through a tax-transfer, policy or (b) endogenously through the payment of untaxed dividends on holdings of banking sector equity.   The first, *interventionist* case lends itself to a further division into two subcases within the two-period-model: the transfers may be directed either to the young or to the old.

Our main results are as follows. First, if profits are returned to the old, whether as direct transfers, constituting a bank profit-financed social security scheme, or as dividends on bank equity, there is a further reduction in the capital stock. However, two distinct mechanisms are involved. The first derives from the obvious consumption-smoothing effect that allocating to the old reduces the incentive to save. The second reason is less standard: the holding of banking equity that is traded between the generations as a store of value crowds out deposit saving, which alone gets channelled through the intermediation process into investment goods. The payment of dividends encourages households to hold banking equity, which, in the terminology of Tirole (1985), constitutes a form of “non-productive saving.”

Alternatively, if profits are distributed to the young, there are two conflicting effects on the capital stock. The well-known effect of lower deposit interest rates reduces the volume of saving *for a given level of incomes of the young*, but the transfer of bank profits raises their incomes. The latter causes a consumption-smoothing effect that may dominate the former, interest rate effect, if, as is generally believed, saving functions are interest inelastic. Consequently, a greater banking concentration ratio is likely to lead to a higher capital stock in the steady-state where profits are returned in this way.

The next section introduces the model. The following Sections, 3 and 4, present the main analysis, contained in three main propositions, and a brief summary.

2. The model

The household sector

A representative household, j , lives for two periods, is young at t and old at $t+1$, and derives utility from consumption in each of these periods, $c_t^{Y,j}$ and $c_{t+1}^{O,j}$,

$$U_t^j = U\left(c_t^{Y,j}, c_{t+1}^{O,j}\right) \quad (1)$$

The household supplies an indivisible unit of labour when young for which it receives a wage, w_t , and is then retired when old. The budget constraint,

$$c_t^{Y,j} + \frac{1}{1+r_{t+1}} c_{t+1}^{O,j} = z_t^Y + \frac{1}{1+r_{t+1}} z_{t+1}^O,$$

$$z_t^Y = w_t + \alpha_t \tau_t \pi_t \qquad z_{t+1}^O = (1-\alpha_{t+1})\tau_{t+1}\pi_{t+1} \quad (2)$$

also accounts for the fact that in each time period, t, there is a flow of banking profit, π_t , that is taxed at the rate, τ_t , and that the revenue raised is distributed to the young and the old in the respective proportions, α_t and $1-\alpha_t$.

Young households may save by acquiring two assets, fixed-price bank deposits, d_t^j , and/or a portfolio of variable-price, v_t , bank equity, e_t^j :

$$s_t^j = d_t^j + e_t^j v_t \quad (3)$$

There is a continuum of households with unit mass, so that aggregate saving is

$$s_t = d_t + e_t v_t , \qquad \text{where } s_t = \int_0^1 s_j^j dj , \quad d_t = \int_0^1 d_j^j dj , \; e_t = \int_0^1 e_j^j dj \quad (4)$$

The young acquire bank deposits, for which they receive the interest rate, r_{t+1}^S, when they are old. They may also buy bank equity from the old, who first receive the dividends payments, $(1-\tau_t)\pi_t$. Capital gains can generally be made, since young households may buy bank equity at the price v_t and sell it on at the price v_{t+1} when they are old to the succeeding generation. To simplify the analysis, we assume that there are no new issues of bank equity, so that at some initial point the whole outstanding stock came into existence.

Consumption in each of the two periods is

$$c_t^{Y,j} = w_t + \alpha_t \tau_t \pi_t - d_t^j - v_t e_t^j \tag{5}$$

$$c_{t+1}^{O,j} = (1-\alpha_{t+1})\tau_{t+1}\pi_{t+1} + (1+r_{t+1}^S)d_t^j + \left((1-\tau_{t+1})\pi_{t+1} + v_{t+1}\right)e_t^j \tag{6}$$

Each young household maximizes utility in equation (1) subject to the budget constraint in the form of equations (5) and (6) by making choices of asset holdings. In general a household might determine both the size and the composition of its portfolio of the asset pair, d_t^j and $e_t^j v_t$. However, as we are assuming certainty equivalence and, thus, a perfect substitutability between the two assets, the composition of the portfolio is indeterminate. The size of the portfolio, however, is determined by the standard, single-asset Euler equation,

$$\frac{\partial U_t}{\partial c_t^Y} = (1+r_{t+1}^S)\frac{\partial U_t}{\partial c_{t+1}^O}. \tag{7}$$

The bank equity price is then determined according to a no-arbitrage, perfect substitutes condition. Using the normalization $e_t = 1$, we find

$$v_t = \frac{(1-t_{t+1})\pi_{t+1} + v_{t+1}}{1+r_{t+1}^S} \tag{8}$$

Assumption: An arbitrarily small cost is incurred each time an asset transaction is made.

We assume that the transaction cost is not high enough to discourage saving, but, being non-zero, will deter each individual from making transactions in *two* assets since they are perfect substitute assets. Each individual, therefore, will transact in only *one* asset, holding either deposits or bank equity. Thus, it follows that the population may be divided into two groups, the *customers* and the *owners* of the banking sector. This implication of this division of households is that the maximization of bank profit or value is equivalent to the maximization owner welfare.[5]

Equation (7) may be presented to give a function for aggregate savings,

$$s_t = d_t + v_t = s\left(z_t^Y, z_{t+1}^O, r_{t+1}^S\right) \quad \text{where } \partial s_t \big/ \partial z_t^Y > 0,\ \partial s_t \big/ \partial z_{t+1}^O < 0 \tag{9}$$

Deposits, the first component of saving in equation (9), alone are channelled through to firms as investment funds via the intermediation process. The second component, financial equity serves only as store of value that is traded inter-generationally within the household sector. It consequently bypasses the intermediation process and does not add to the capital stock, constituting "non-productive saving" in the words of Tirole (1985).

The capital accumulation process is thus given by

$$k_{t+1} = d_t = s\left(z_t^Y, z_{t+1}^O, r_{t+1}^S\right) - v_t \tag{10}$$

Note that the greater the value of banking equity, the greater the crowding-out of productive saving and the capital stock.

The production sector

The usual assumptions are made for the output sector: production is carried out under constant returns to scale, using capital and labour, which each have positive and decreasing marginal products:

$$y_t = f(k_t),\quad f' > 0,\ f'' < 0, \tag{11}$$

The maximization of per capita profit,

$$\Psi_t = f(k_t) - r_t^L k_t - w_t,$$

occurs where the interest rate at which the firm borrows equates with the marginal product of capital,

$$r_t^L = f'(k_t) \tag{12}$$

[5] This overcomes the problem of general equilibrium models with imperfect competition where the owners of the firms are also the customers. Hart (1985) shows that demand functions may then become less well-behaved and that the underlying objective of profit or value maximisation itself may be in question.

The wage is then determined by the competitive, zero-profit ($\Psi_t = 0$), no-entry condition:

$$w_t = f(k_t) - f'(k_t)k_t , \qquad \frac{\partial w_t}{\partial k_t} = -f''(k_t)k_t > 0 \tag{13}$$

The financial sector

In contrast, the banking sector is assumed to be characterized by Nash-Cournot competition with N independent banks, indexed $z, z = 1,..N$. Each bank intermediates between households and firms by raising deposits from the young at time t, $d_{Z,t}$ and by issuing loans, which generate capital investment at time $t+1$, $k_{Z,t+1}$. At this subsequent date, firms are charged the loan rate of interest, r_{t+1}^L, and old households are paid the deposit rate of interest, r_{t+1}^S, so that for each bank earns the taxed profit:

$$\Pi_{Z,t+1} = (1-\tau_{t+1})\left(r_{t+1}^L k_{Z,t+1} - r_{t+1}^S d_{Z,t}\right)$$

It is not feasible for banks to lend out more funds than they receive: $k_{Z,t+1} \le d_{Z,t}$; a positive rate of profit, $r_{t+1}^L > r_{t+1}^S$, implies that for each bank it is never optimal to lend less funds than it receives, so that $k_{Z,t+1} = d_{Z,t}$, and in aggregate

$$k_{t+1} = d_t , \quad \text{where } k_{t+1} = \sum_{Z=1}^{N} k_{Z,t+1} , \quad d_t = \sum_{Z=1}^{N} d_{Z,t} \tag{14}$$

Thus, each bank's profit is

$$\pi_{Z,t+1} = (r_{t+1}^L - r_{t+1}^S)k_{Z,t+1} \tag{15}$$

We assume that the bank maximizes one-period profit[6] by choosing a quantity of individual funds/loans, $k_{Z,t+1}$, anticipating its effect on the aggregate, $\partial k_{t+1} / \partial k_{Z,t+1} = 1$, from equation (14), and, thence, on both market interest rates, r_{t+1}^L - from equation (12) - and r_{t+1}^S - from the following inversion of equation (10)[7],

[6] Roberts (2003) considers instead value maximization, admitting additional effects that will only be of second-order significance within a two-period overlapping-generations model and at the price of greater complication.

[7] This is also an expansion of equation (7).

$$r_{t+1}^S = r^S\left(k_{t+1}; \bar{z}_t^Y, \bar{z}_{t+1}^O, \bar{v}_t\right) \tag{16}$$

We assume that the deposit interest rate cannot fall below a minimum value, $r_{t+1}^S \geq r_{t+1}^{MIN}$. Nominal interest rates cannot effectively fall below zero, unless the confiscation of some of the principal is allowed. The minimum for the real interest factor is then the inverse of the inflation factor.

It is necessary for an interior solution that $\partial r_{t+1}^S / k_{t+1} > 0$, which in turn depends on $\partial s_t / \partial r_{t+1}^S > 0$.[8]

Each bank, whether big or small, is assumed to take no account of the effects of its actions on the household allocations, z_t^Y and z_{t+1}^O, nor on the value of bank equity, v_t. Equations (12), (15) and (16) imply that each bank's profit is

$$\pi_{Z,t+1} = \left(f'(k_{t+1}) - r^S(k_{t+1};..)\right)k_{Z,t+1} \tag{17}$$

The interior solution, $r_{t+1}^S > r_{t+1}^{MIN}$, obtains where

$$f'(k_{t+1}) - r_{t+1}^S + \left(f''(k_{t+1}) - \frac{\partial r_{t+1}^S}{\partial k_{t+1}} \right) k_{Z,t+1} = 0$$

In symmetric equilibrium, this becomes

$$f'(k_{t+1}) - r_{t+1}^S + \left(f''(k_{t+1}) - \frac{\partial r_{t+1}^S}{\partial k_{t+1}} \right) \frac{k_{t+1}}{N} = 0$$

It is useful to apply the following definitions for the interest elasticities of investment and saving,

$$\eta_{t+1} \equiv \left| \frac{f'(k_{t+1})}{f''(k_{t+1})k_{t+1}} \right| > 1, \quad \varepsilon_{t+1} \equiv \frac{r_{t+1}^S}{\left(\partial r_{t+1}^S / \partial s_t\right) s_t} \tag{18}$$

The solution may then be presented in terms of a relationship between the two interest rates,

$$r_{t+1}^S = \mu_{t+1}\left(N, \varepsilon_{t+1}, \eta_{t+1}\right) f'(k_{t+1}), \qquad [\, r_{t+1}^L = f'(k_{t+1}) \,]$$

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[8] If income effects dominate substitution effects, so that the interest elasticity of saving is negative, but not, plausibly, of a greater magnitude than the negative interest elasticity of investment, bank profit is maximized where the deposit rate of interest is at a minimum.

where $\mu_{t+1}(N, \varepsilon_{t+1}, \eta_{t+1}) \equiv \dfrac{N - 1/\eta_{t+1}}{N + 1/\varepsilon_{t+1}}$, $\qquad r^S_{t+1} > r^{MIN}_{t+1}$ [9] (19)

The term, μ_{t+1} is the *mark-down factor* by which the deposit interest rate is reduced below the loan interest rate.[10] If at least one of the two interest elasticities is finite, imperfect competition, $N < \infty$, implies that the mark-down factor is less than unity, $\mu_{t+1} < 1$, so that $r^S_{t+1} < r^L_{t+1}$.

This generates positive values for banks' profits and their value of their equity. These are solved in the steady-state, using equations (17) and (19) and then (8): which, in the steady-state, have the respective solutions,

$$\pi = (1 - \mu(N)) f'(k)k \tag{20}$$

$$v = \frac{(1-\tau)(1-\mu(N))k}{\mu(N)} \tag{21}$$

Substituting equation (19)-(21) into (10) gives the complete solution of the model, $k = \dfrac{s(z^Y, z^O r^S)}{1 + (1-\tau)(\mu^{-1} - 1)}$ where $z^Y = [f(k) - f'(k)k] + \alpha\tau(1-\mu) f'(k)k$,

$$z^O = (1-\alpha)\tau(1-\mu) f'(k)k, \qquad r^S = \mu f'(k) \tag{22}$$

3. Analysis

We assume that the function in equation (22) is well-behaved, having the property $1 - \partial RHS/\partial k > 0$. This assumption is required to obtain non-perverse comparative statics, for example, $\partial k_{t+1}/\partial z^Y_t > 0$ given that $\partial s_t/\partial z^Y_t > 0$ in equation (9).

Result 1: For a given tax rate, τ, the steady-state capital stock is greatest where $\alpha = 1$.

Equations (9) and (22) imply

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[9] If $r^S_{t+1} = r^{MIN}_{t+1}$, $r^L_{t+1} = f'(s(r^{MIN}_{t+1}))$ and $\mu^{MIN}_{t+1} = f'(s(r^{MIN}_{t+1}))/r^{MIN}_{t+1}$

[10] The value could be quite small, because of discounting over a 35 year half-life. If loan rates exceed deposit rates by as much as 4% per annum, then μ_{t+1} approximates 0.25.

$$\frac{\partial k}{\partial \alpha} > 0 \quad as \quad \left(\frac{\partial s}{\partial z^Y} - \frac{\partial s}{\partial z^O} \right) \tau \Pi > 0$$

This is a straightforward consumption-smoothing result that a reallocation from the old to young raises life-cycle saving.

Result 2: If all transfers go to the young, $\alpha = 1$, *the steady-state capital stock is greatest where* $\tau = 1$.

Setting $\alpha = 1$ renders equation (22) as

$$k = \frac{s\left(z^Y, 0, r^S\right)}{1 + (1 - \tau)\left(\mu^{-1} - 1\right)}$$

$$\frac{\partial k}{\partial \tau} > 0 \quad \text{as} \quad \frac{\partial s}{\partial z^Y} > 0 \text{ and } \mu < 1$$

This results from both a consumption-smoothing response, increasing total saving, and the fall in the price of bank equity, as taxed profits fall, reducing "unproductive saving."

Returning bank profits to the old

Proposition 1: Returning profits to the old, either exogenously through fiscal transfers or endogenously through untaxed dividends, leads to a (further) reduction in the steady-state of the capital stock.

This follows from *Results 1* and *2.* ‖

An interesting question is which of the two options will lead to the greater reduction in the capital stock? To answer this, we impose $\alpha = 0$, the condition that the young receive none of the transfers, and then consider how varying τ affects the steady-state capital stock. A rise in τ represents a movement from an endogenous to an exogenous return, since dividends fall and fiscal transfers increase. This could also be interpreted as an increase in bank-profit financed social security payments.

If $\alpha = 0$,
$$k = \frac{s\left(w, z^O, r^S\right)}{1 + (1 - \tau)\left(\mu^{-1} - 1\right)} \tag{23}$$

we find that

$$sign\left(\frac{\partial k}{\partial \tau}\right) = sign\left(\frac{\partial s}{\partial z^O}\frac{z^O}{s} + \frac{(1-\mu)\tau}{\mu + (1-\tau)(1-\mu)}\right) \tag{24}$$

The first term on the right hand side is the elasticity of savings with respect to second-period, which is negative where $z^O > 0$. It is not possible, *a priori*, to sign the derivative, not least because the magnitude of this first term is also increasing in τ.

In order to obtain some perspective on what could happen, we consider a logarithmic function for utility, $U_t^j = \ln c_t^{Y,j} + (1+\theta)^{-1}\ln c_{t+1}^{O,j}$, where θ is the rate of time preference, and a Cobb-Douglas function for production, $f(k) = k^{\beta}$. We obtain the following result.

Proposition 2: If profits are returned to the old and if the utility function is logarithmic and the production function is Cobb-Douglas production function, the steady-state of the capital stock is higher under an exogenous return of bank profits,

(i) for large values of N*, if* $r^{MIN} < \left(\beta(1+\theta)/(1-\beta)\right) - 1$*, and*

(ii) for all values of N*, if* $r^{MIN} > \left(\beta(1+\theta)/(1-\beta)\right) - 1$.

Proof: (i) If the utility function is approximately logarithmic, as $N \to \infty$, $r^S \to f'(k) = \frac{\beta}{1-\beta}(2+\theta)$. Equation (24) is then solved as

$$sign\left(\frac{\partial k}{\partial \tau}\right) \to sign\left(\frac{1-\beta}{\beta\left(1+\beta(1+\theta)\right)}\right) > 0$$

(ii) If $r^S = r^{MIN}$, because $N < \infty$, equation (24) is solved as

$$sign\left(\frac{\partial k}{\partial \tau}\right) = sign\left(\frac{1-\beta}{\beta} - \frac{1+\theta}{1+r^{MIN}}\right).$$

If the rate of time preference, θ, is sufficiently high or else the number of banks, N, is sufficiently high, a bank-profit-financed social security policy will raise the capital stock. $\|$

Returning bank profits to the young

We now set $\tau = 1$ and $\alpha = 0$, to get

$$k = s\left(z^Y, 0, r^S\right) \tag{25}$$

The homogeneity of the savings function allows us to represent it in the $\tau = 1, \alpha = 0$ case as the product of the income-independent savings ratio, $\sigma(.)$, of the total income of the young,

$$w(k) + \pi(k) = \left[f(k) - f'(k)k\right] + (1-\mu) f'(k)k = f(k) - \mu f'(k)k\,,$$

so that equation (22) becomes

$$k = \sigma\left(\mu f'(k)\right)\left[f(k) - \mu f'(k)k\right], \qquad \text{as } f(k) = w(k) + f'(k)k \tag{26}$$

Differentiating k with respect to N, through μ, shows that

$$sign\left(\frac{\partial k}{\partial N}\right) = sign\left(\frac{\partial \sigma}{\partial R^S}\left[f(k) - \mu f'(k)k\right] - \sigma k\right)$$

We use the notation, $\varepsilon \equiv \dfrac{R^S}{\sigma}\dfrac{\partial \sigma}{\partial R^S}$, for the interest elasticity of saving, where $\varepsilon *$ is a value that is too low for an interior solution, and define β as the share of payments going to capital, $\beta \equiv \dfrac{f'(k)k}{f(k)}$, so that

$$sign\left(\frac{\partial k}{\partial N}\right) = sign\left(\left(\varepsilon - \beta(1+\varepsilon)\right)N + 1 - \beta(1+\varepsilon)/\eta\right) \tag{27}$$

Proposition 3: If all profits are transferred to the young, $\tau = 1, \alpha = 1$, *the capital stock is greatest under imperfect competition if* $\varepsilon < \beta/(1-\beta)$.

Equation (25) shows that if $\varepsilon < \beta/(1-\beta)$, there is a range of large values for N such that $\partial k/\partial N < 0$.[11] If $\varepsilon * < \varepsilon < \beta/(1-\beta)$, so that $r_{t+1}^S > r_{t+1}^{MIN}$, there is an interior maximum for the steady-state capital stock where $N = \dfrac{1 - \beta(1+\varepsilon)/\eta}{\beta(1+\varepsilon) - \varepsilon} < \infty$. Alternatively, if $\varepsilon \le \varepsilon *$, so that at low values of N, $r_{t+1}^S = r_{t+1}^{MIN}$, k is never increasing in N.

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[11] As the saving elasticity, ε, generally decreasing in r^S, which will rise as should k falls. In the steady-state, little effect on the loan elasticity, η, and the capital share, β, would be expected.

The intuition is as follows. If the interest elasticity of saving is sufficiently low, the effect of imperfect competition in depressing the deposit rate of interest will have little effect on the proportion of income that is saved, while the profit return raises the income of the young and the saving as a proportion of income.

A Cobb-Douglas example

The Cobb-Douglas production function, $f(k) = k^{\beta}$, is useful for assigning numerical values and for pinning down the value of the investment elasticity, since $\eta = (1-\beta)^{-1}$. Applying the stylized capital share value of $\beta = 1/3$, the capital stock is greatest under imperfect competition if $\varepsilon < 1/2$. If $\varepsilon^{MIN} < \varepsilon < 1/2$, the capital stock is maximised with $N^* = \dfrac{3 + (2/3)(1+\varepsilon)}{1-2\varepsilon}$. If $\varepsilon = 1/3$, the nearest integer to N^* is 12; and if $\varepsilon = 1/6$, the nearest integer to N^* is 6.

If $\varepsilon \le \varepsilon^*$, so there is no interior solution and $r^S = r^{MIN}$. Returning to the approximate case of a logarithmic utility function, $U_t^j \approx \ln c_t^{Y,j} + (1+\theta)^{-1} \ln c_{t+1}^{O,j}$ implies $\varepsilon \approx 0$.[12] The steady-state of the capital stock is solved as

$\tilde{k} \approx \left(2 + \theta + r^{MIN}\right)^{-(1/1-\beta)} \; \forall N < \infty$, while as $N \to \infty$,

$k^* \approx \left((2+\theta)/(1-\beta)\right)^{-(1/1-\beta)}$ and ,

$r^S \to r^{MAX} = f'(k^*) = \beta k^{*\beta-1} \approx \beta\left((2+\theta)/(1-\beta)\right)$

Inspection shows that $\tilde{k} > k^*$ as $r^{MAX} > r^{MIN}$.

We can also conclude that a monopolistic banking sector would lead to a lower reduction in the capital stock, or even a slight increase, under an interventionist policy regime, given that we would also expect some proportion of bank profits to be transferred to the young. For this reason, a non-interventionist fiscal regime, that allows profits to be returned endogenously through dividends, but one that is also concerned with capital accumulation is likely to be less tolerant of a high concentration of banks than an interventionist regime. In this light, a regulatory framework that is geared to encourage entry might be regarded as policy substituting for one of high taxation.[13]

Summary of results

Although there are other possibilities, we have shown that if profits are returned to households, the way in which they are may be crucial for how monopolistic banking affects capital accumulation. If profits are returned to the old, either by fiscal transfers or by dividend payments, saving and capital are unambiguously decreased on top of the possible reduction caused by the effect of lower deposit interest rates on saving. However, if profits are returned to the young, the capital stock will be higher under imperfect competition, if the interest elasticity of saving is very low as is generally believed.

A distribution policy that favours the young in this way might normally not be pursued on the grounds of intergenerational equity, unless an over-riding concern was with macroeconomic development. Even so, this consideration does not distract from an essential point that has been made: that the relationship between banking competition and capital accumulation may not depend on the degree of competition *per se*, but on accompanying tax and transfer policies.

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[12] Income and substitution effects cancel each other out in the logarithmic case and there is no interest discounting effect where $\alpha = 1$.

[13] This parallels the argument in favour of financial repression where the profits of state-owned banks are an important for the public finances.

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