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Small Business Borrowing and Control:
A Theory of Entrepreneurial Types

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SMALL BUSINESS BORROWING AND CONTROL: A THEORY OF ENTREPRENEURIAL TYPES

ABSTRACT

A formal model of the bank borrowing decision by the small firm is provided to explain why some businesses borrow and others do not and why some businesses grow and others remain stationary.

Loan capital is productive and increases the firm's revenue but brings the business under the control of the bank. Profits generated by borrowing are a "good" increasing owner utility whereas control is a "bad", reducing it. The consequent tradeoff between borrowing and control implies that the business' optimum will involve borrowing less than the amount that maximises profits. If owner control-aversion is strong enough equilibrium may involve a corner solution with the business being entirely self-funding. The above result holds under conditions of symmetric information and zero credit rationing.

Dynamic analysis distinguishes one group of entrepreneurs (Movers) whose preferences towards control evolve through time (control-aversion diminishes) from another group (Stayers) whose preferences remain stationary. For the Movers borrowing increases through time up to a profit-maximising optimum whereas for the Stayers independence of control is maintained at the expense of non-growth.
SMALL BUSINESS BORROWING AND CONTROL: A THEORY OF ENTREPRENEURIAL TYPES

1. INTRODUCTION
It is a remarkable fact that some 66% of startups in the UK appear not to borrow from their bank to commence business (Cressy, 1992a). Even considering more mature businesses apparently no more than 50% borrow at some stage from their bank (NatWest bank, internal communication). Equally remarkable however is the fact that some 50% of businesses do not appear to grow over long periods of time (Watson, 1990)\(^2\).

The mainstream finance literature (e.g. Stiglitz and Weiss, 1981; Evans and Jovanovic, 1989) explains non-borrowing as a Second Best outcome largely to be accounted for by imperfections in capital markets, in particular the by the existence of debt and equity gaps. More recently the efficient contract literature has used asymmetric information to show that levels of borrowing may be suboptimal (e.g., Boot, Thakor and Udell, 1991). In this tradition the empirical observation that small firms are more likely to be credit-rationed than large is presumably to be explained by a shorter track record accentuating the information asymmetry problem.

The present paper diverges entirely from this debt/equity gap tradition by developing a model of small business borrowing that explains non-borrowing and non-growth as an optimal (i.e. First Best) solution to the problem of conflict between the productiveness of financial capital and the desire for business independence from outside control. Central to the theory is the idea of 'control-aversion' associated with bank borrowing by small firms. Whilst this notion goes back to the Bolton Committee of the early 1970s (Bolton, 1971) the idea has never been integrated into an optimising model of firm behaviour. Recognising that loan capital is productive, increasing the firm's revenue, our theory argues that the fact of borrowing itself brings the business under bank 'control'. This may take the form of monitoring of activities, regulation of overdraft facilities, requirements for business plans as a condition for loans, and so on. Control in this theory does not require the bank to take a stake in the firm.

Unlike traditional models of borrowing which assume identical risk-neutral (or occasionally risk-averse) entrepreneurs, owner preferences are now defined over both profits and 'control' (loan size). Profits generated by borrowing are a "good" and increase owner utility but control is a "bad", reducing it. The consequent tradeoff between borrowing and control implies that the business' optimum will involve borrowing less than the amount that maximises profits. If owner preferences against control are strong enough equilibrium may involve a corner solution with the

\(^2\) Watson finds that in a sample of some 200 small, closely held UK companies in the period 1974-1981 the median employment growth rate was 2.04 (p.265).
business being entirely self-funding. More owner wealth moreover will cause the substitution of own for borrowed funds.

2. THE LITERATURE
The Bolton Committee first pointed out the fact that small firms operations are often self-financed and that small business owners are highly jealous of their independence (Bolton, 1971). Evidence from UK startups indicates a contemporary confirmation of the self-financing phenomenon. Cressy (1992a) reports that in a 1988 nationwide sample of 2000 UK business starts some 28% used personal equity finance alone to start in business.

The prevailing theoretical literature however (e.g. Stiglitz & Weiss, 1981) and some prominent American empirical work (e.g. Evans and Jovanovic, 1989) assumes that non-borrowing and non-growth of firms is largely to be explained by imperfections in capital markets, in particular by the existence of debt and equity gaps. Failure of firms to grow is thus a result of financial constraints on growth.

Stiglitz and Weiss (1981) argue that the bank may find it optimal not to raise interest rates in conditions of excess demand because by so doing it will worsen the quality of the borrower pool. This arises because only high risk borrowers can pay the higher interest rate. Equilibrium capital rationing may therefore exist.

The efficient contract literature (e.g. Boot, Thakor and Udell, 1991) rejects the notion of equilibrium credit rationing but uses asymmetric information to indicate why levels of borrowing, interest rates, collateral etc may be suboptimal. Under private information about borrower types low quality borrowers impose an externality on high quality ones: to avoid low quality applicants dissembling high quality ones the latter’s contract must be made less attractive to the former (e.g. by imposing collateral requirements which would under symmetric information not be necessary.)

A third strand of thinking (De Meza and Webb, 1987) generalises Stiglitz-Weiss to projects differing not simply by a mean preserving spread of returns. They argue that under these conditions asymmetric information may result in surplus funds being supplied in equilibrium as good projects ‘suck in’ bad.

\[\text{\underline{3}}\] Under asymmetric information the social optimum requires that all projects which have positive expected value be undertaken and that interest rates be inversely related to project quality. Since under asymmetric information the bank cannot (without incentive compatibility constraints) distinguish high from low quality applicants the resulting common interest rate charged to firms can now be lower than the minimum interest rate at the social optimum. This is because the good borrowers now subsidises the bad ones to give zero expected bank profits. Thus an equilibrium can exist with an excess supply of credit.
In these three 'traditions' borrowers are usually distinguished only by the probability of bankruptcy and borrowers' utility is usually linear in profits. Owner initial wealth is usually ignored or assumed to have no productive value, functioning merely in an opportunity cost role. By their nature therefore these theories cannot explain non-borrowing in terms of productivity of owner wealth or in terms of owner preferences towards control by outsiders.

We shall assume in what follows that owner wealth is productive. This means it will enter the project return function as a perfect substitute for borrowed funds and therefore if more total capital is used the gross return to risky investment will increase. Intuitively an increase in initial wealth should have three effects: (i) gross revenue should rise as bigger projects are available; (ii) the marginal product of capital at the pre-existing level should fall resulting in a decline in borrowing to restore equilibrium; and (iii) control-aversion should induce a still larger reduction in borrowing as the entrepreneur substitutes her own (now more plentiful) funds for those of the bank. Project size, however, consisting of initial wealth plus borrowed funds, is expected to be ambiguously related to owner wealth. For against the increase in revenue that arises from more capital becoming available must now be set the disutility of borrowing associated with a larger project. Thus we should expect in an empirical cross-section that businesses with more control-aversion (cet par) will be operating at a smaller scale than businesses with less. Project size will decline with wealth (for a given degree of control aversion) only if the degree of control aversion is large enough.

Finally traditional industrial economics (e.g. Berle and Means, 1932) assumes that control of a firm always takes the form of a stake in firm equity. However in practice this is frequently not the case, especially with respect to small businesses. For example in the UK context where the four major Clearers deal with some 80% of accounts the banks almost never take a stake in the firm and yet at least half and possibly the majority of businesses do not borrow from the banks(Cressy, 1992a). This is further evidence that there may be factors at work discouraging

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4 I.e. initial wealth does not enter the gross revenue function R(.) defined below.

5 Wealth represents the return foregone by investing all the owners wealth in an alternative 'safe' project.

6 Revenue net of costs other than interest payments.

7 This arises because although the utility of an extra pound to the entrepreneur is the same from own or bank sources the marginal disutility of control associated with the extra bank borrowing implies total owner utility is higher if own funds are employed.

8 This is in distinction to the 'traditional' model where initial wealth plays only an opportunity cost role. In the latter case an increase in wealth will always reduce project size.
borrowing other than equity-based control. In practice 'control' in banking relationships typically takes the form of monitoring of activities, of altering the terms of borrowing (borrowing levels, interest margins, loan duration, charges etc.) with little reference to the wishes of the business\(^9\). Small businesses dislike this perceived 'interference' in their operations and from the evidence cited above seem to prefer (other things equal) to be self-financing.

This view has further support from academic studies which have indicated that growth may well be limited by the psychology of the entrepreneur and the financial stress of growth rather than financial resources as such. For example Hutchinson and Ray(1986) show that in a sample of UK businesses fast growers are characterised by a higher debt-equity ratio and make more use of long term debt than slow-growers. An important constraint in their view is the conservative attitudes of the owners to the role of outside institutions such as banks and venture capitalists which alter the way the business is run.

3. THE THEORY OF CONTROL-AVERSION
The environment considered is one of symmetric information. A First-Best efficient contract is analysed. This means that the probability of success of the business project is known to both firm and bank\(^{10}\).

Firms

A firm of type \(\theta\) can invest its wealth either in a safe project certain (1+) rate of return \(r\) or in a risky project. The risky project either requires no borrowing and has gross return \(R_\theta(W)>0\) with probability \(p\) and zero with probability \(1-p\) or requires borrowing \(L\) and yields gross return \(R(L+W)=R_\theta(W)+S(L+W)\) or zero with the same probabilities. \(R(.)\) is a concave increasing function: \(R'>0, R''<0\).

The total value (cost) of the project is \(K=L+W\) which is no less than \(W\). If the project is successful then the net return is \(F(L)=R(L+W)-\alpha L-rW\). If unsuccessful interest payments are foregone by Limited Liability but the entrepreneur loses collateral \(C\) posted as security for the loan. Thus his net return under failure is \(B=-C-rW\).

The firm of type \(\theta\) has utility function \(U(x_s,L|\theta)\) where \(x_s\) represents net income in state \(s\) (success/failure) and \(\theta\) is an index of the entrepreneur's disutility of control. We assume \(U\) is concave increasing in \(x\) but concave decreasing in \(L\). Thus indifference curves are upward-sloping in \((L,F)\)-space (Figure 1).

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\(^9\) UK clearing banks are famous for informing customers of charges (and changes to charges) after they have been deducted from the customer's account.

\(^{10}\) More generally imperfectly known to both. For example both parties might have priors on certain parameters that are updated by common information.
L thus has a dual role in this theory: it may enhance utility via profitability \( F(L) \) but may decrease utility via control, \( L \).

Expected utility of the entrepreneur, \( EU \), is given by

\[
EU = pU(F,L) + (1-p)U(B,L)
\]

where \( F = R(W+L) - aL - rW, \) \( B = -C - rW \)

The parameter \( \theta \) influences the firm's marginal rate of substitution between profit and control:

\[
MRS(F,L|\theta) = -EU_L/EU_F, \quad \partial MRS/\partial \theta > 0
\]

\[
= -pU_L/(1-p)U_F
\]

Thus higher \( \theta \) is associated with greater control-aversion and this is reflected in a steeper sloped indifference curve in \( (L,F) \)-space.

We shall assume also that the utility function is additively separable in \( (x,L) \). Note that separability of \( U(x,L) \) implies that the partials \( U_x \) and \( U_L \) are a function of \( x \) alone and \( L \) alone respectively. In particular we shall write the partials of \( U \) with respect to \( L \) and \( F \) as \( U_L = U_L(L|\theta), \) \( U_F = U_F(F) \) to indicate this dependence. Thus the marginal utility of control is independent of the level of profit.\(^{11}\) An example of a utility function satisfying these conditions is

\[
U = -e^{-\eta F} -e^{\theta L} \quad \eta, \theta > 0
\]

**Banks**

Risk-neutral banks can purchase funds from the money market at riskless rate \( r \) and lend at \((1+\alpha)\) interest rate, \( \alpha \), requiring total collateral for the loan \( C \). Collateral is valued at £1 to the borrower but at only £\( r \beta \) (\( \beta < 1 \)) by the bank. This asymmetry of valuation represents 'dissipative' costs to collateral, since the

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\(^{11}\) The assumption that \( MRS \) is increasing in \( \theta \) is now equivalent to assuming \( U_{L\theta} < 0 \).
firm's assets cannot be costlessly cashed in by the bank (Boot, Thakor and Udell, 1991.) Scope for trade between borrowers and lenders then arises because marginal rates of substitution will differ between borrowers and lenders. (See below.)

Banks are assumed to have infinite borrowing capabilities at the safe rate and possess no initial wealth. The bank's return consists of its interest payments on the loan, αL, if the project is successful and the collateral posted by the borrower, BC, if not. However from each of these amounts the bank must subtract the cost of borrowing its funds rL. Competition amongst banks ensures that expected profits to the bank are zero:

\[ \pi = p\alpha L + (1-p)BC - rL = 0 \]  \hspace{1cm} (4)

**Equilibrium**

The efficient contract (EC) is designed to maximise one party's utility subject to a fixed level of utility of the other. This result is equivalent to a Pareto optimum in loan contract-space.\(^{14}\) An EC would come about in the free market if individuals' were without market power and free to bargain.

We shall show that the first best contract involves the following features:

(i) if a business of type θ borrows then the expected marginal return to a firm on the optimal project in non-bankruptcy states (R'(L)) equals the expected marginal interest cost (α) plus the marginal rate of substitution between profits and control (-U_r/pU_r)

(ii) if a business of type θ' > θ does not borrow then the expected marginal return to a firm on the optimal project is no greater than the expected marginal interest cost plus the marginal rate of substitution between profits and control

(iii) zero collateral (C) is posted on loans to all types θ

(iv) the expected marginal cost of funds to the Bank (1 +

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\(^{12}\) α=1 implies that collateral will be employed in all loans.

\(^{13}\) An alternative assumption would be that firms have zero profits and banks potentially supernormal profits.

\(^{14}\) Thus we have the equivalent of an Edgeworth Box except that resources in total are not fixed.
the safe rate, \( r \) equals its expected marginal return (1 +
expected lending rate, \( p\alpha \))

(v) entrepreneurs with higher control aversion \( \theta \) are
less likely to borrow

**Equilibrium Conditions in \( (L,F) \)-Space**

Note from Figure 1 that an expected profit-maximising firm will
borrow up to the point where the marginal return in non-
bankruptcy states \( R'(L) \) equals \( (1 + \alpha) \) the rate of interest on its
risky project \( \alpha \). This occurs at \( L^* \) where \( F'(L)=0 \). If however
borrowing (control) has disutility to the entrepreneur borrowing
to maximise profit can never be optimal. Dislike of control
generates upward-sloping indifference curves in \( (L,F) \)-space which
are by assumption steeper the greater the firm’s control-aversion
\( \theta \). Thus at \( L^* \) the entrepreneur will find the (certain)
disutility of control from the marginal £ borrowed \( -U_L \) greater
than the (expected) utility of the extra revenue it generates
\( -pU_L(R'-\alpha) \). Thus optimum borrowing must be less than \( L^* \).

If control-aversion is moderate \( \theta=\theta_n \) demand for bank borrowing
produces an interior solution at \( L^* \) where the expected marginal
return to borrowing \( pU_L(R'-\alpha) \) equals the (positive) marginal
psychic cost of control \( -U_L \). If control-aversion is substantial
\( \theta=\theta_n \) the firm will find that the marginal disutility of control
is greater than the marginal utility of profit from borrowing at
all positive levels of the latter. Thus the firm becomes self-
financing \( K=W \). A corner solution in borrowing occurs at \( L^*=0 \)
with \( pU_L(R'-\alpha) \leq -U_L \) or \( R' \leq -U_L/pU_L=MRS_{FL} \).

**Equilibrium Conditions in \( (\alpha,C) \)-Space**

Consider the second proposition that in equilibrium zero
collateral is posted on all loans (Figure 2). Note that a firm’s
return is decreasing in both \( \alpha \) and \( C \) which means that it seeks
the lowest expected utility isoquant EU compatible with the
bank’s zero profit condition \( \pi=0 \) in Figure 1. By definition
equilibrium must be a point on the bank’s zero profit constraint.
For an interior solution in \( C \) we require the indifference curves
of the firm and bank be tangent. It is easy to see however that
this condition cannot be satisfied.

[Figure 2 about here]

The slope of the firm’s EU indifference curves is

\[
\frac{dC}{d\alpha} \bigg|_{EU} = -E_\alpha U/E_C U = -pU_L/(1-p)U_B
\]  

(5)

The slope of the bank’s indifference curve is
\[ \frac{dC}{d\alpha}|_{E_\pi=0} = -E_\pi/E_c\pi = -pL/(1-p) \beta \] (6)

For these slopes to be equal we require \( U_a/U_r = \beta \) which is impossible since \( U_{ma}/U_{mr} < 0 \) and \( F > B \). Hence \( C^* = 0 \).

From a market perspective an efficient contract must have zero collateral since from any positive level of collateral (point A in Figure 2) by trading \( C_2 \) collateral for \( \alpha' - \alpha_2 \) interest the bank would be indifferent (\( \pi = 0 \)); however the firm would have to pay \( \alpha_1 - \alpha_2 \) interest to get a reduction of this amount. Hence the firm can always increase its utility by paying some amount between these two figures. Utility-maximising collateral occurs at \( C^* = 0 \). Substituting this into the zero profit constraint (4) gives \( \alpha^* = r/p \).

Thus we have the following inequalities characterising the equilibrium solution:

\[ R'(W+L) - \alpha = -U_L/pU_p \text{ if } L^* > 0 \] (7)

\[ R'(W+L) - \alpha \leq -U_L/pU_p \text{ if } L^* = 0 \] (8)

\[ C^* = 0 \] (9)

\[ \alpha^* = r/p \] (10)

These are identical to propositions (i-iv) above. Proposition (v) follows from the fact that if borrowers are distributed across \( \theta \) then lower values of \( \theta \) are associated with lower borrowing since the MRSrL is increasing in \( \theta \).

Note that if \( U(F,L) = F \), which implies no disutility of control, the RHS of equations 7 and 8 is then zero (rather than positive.) Thus we have the classical case of expected wealth maximisation with borrowing \( L = L^* \). Figure 1 shows that for fixed entrepreneurial type \( \theta \) borrowing under control-aversion, \( L^* \), is less than \( L^* \).

4. COMPARATIVE STATICS
Comparative statics examine the effect on loan size, project size (\( K = L + W \)) and the interest rate (\( \alpha \)) of changes in entrepreneur wealth (\( W \)), human capital inputs (\( \delta \), in \( R'(L|\delta) \)), the safe rate (\( r \)) and the probability of survival (\( p \)). We shall assume that marginal

\[ \text{This result follows from the fact that the marginal utility of income is decreasing. It is unaltered if } \delta < 1 \text{ is replaced by } \delta = 1. \]
revenue increases in $\delta$.

i) For borrowers ($L^*>0$), higher initial entrepreneurial wealth ($W$) decreases borrowing, has an ambiguous effect on project size ($K$), and leaves the interest rate unchanged.

For non-borrowers ($L^*=0$), higher initial entrepreneurial wealth will not induce borrowing, will increase project size and will leave the interest rate unchanged.

**Borrowers**

As initial wealth increases at the initial equilibrium $L'$, (Figure 3) the slope of the borrower's indifference curve increases. This occurs for two reasons: a decrease in the productivity of capital and an increase in the MRS (control-aversion).

[Figure 3 about here]

Firstly, a higher capital level reduces the marginal return to borrowing, making the net return $R'(W_i+L'_i)-\alpha$-MRS negative at the old borrowing level and inducing a reduction in borrowing from $L'_1$ to $L_1$. At the same time total profits have increased ($F(.)$ shifts upwards from $F_1$ to $F_2$ in Figure 3) since the marginal $f$ of capital produces a return $R'$ in excess of the interest cost $\alpha$ by the amount $\text{MRS} = \frac{U_i}{pU_r}$. This is the productivity effect. Higher profits in turn reduce the marginal utility of income $U_r$, so that the marginal rate of substitution between profits and control (MRS) now exceeds the marginal rate of transformation of profits into control ($F'$) causing a reduction in borrowing from point B. The control-aversion effect is thus the movement from B to C where the marginal rate of substitution between profits and control once more equals the rate of transformation. Both effects operate in the same direction to reduce equilibrium borrowing.

The intuition behind the second effect is clear: the marginal utility of an extra $f$ in funds from own or bank sources would be the same (funds would be perfect substitutes) if there were no control associated with bank borrowing or such control had no psychic effects. However with disutility of control associated with more borrowing utility is maximised by choosing to substitute bank funds for own equity.

Project size $K=W+L$ increases directly with wealth $W$ but since optimal borrowing $L(>0)$ decreases with wealth the net effect is ambiguous\(^{16}\).

\(^{16}\) If the marginal decrease in borrowing consequent on a unit increase in $W$ is increasing in $\delta$ this would imply that sufficiently control-averse individuals would reduce project size as wealth increases. On the other hand if it is decreasing in $\delta$ project size would unambiguously increase in $\delta$. 
Non-borrowers
An entrepreneur at \( L^* = 0 \) finds the slope of her indifference curve at least that of the budget line \( F(K) \). As \( F(K) \) shifts up with \( W \) she becomes more control averse. This is reflected in an increase the slope of her indifference curve at the \( Y \)-axis and a tangency at \( L = 0 \) is converted into an inequality whilst an inequality becomes more acute. Thus a corner solution is preserved as owner wealth increases and non-borrowers are not converted into borrowers. The direct effect of an increase in wealth is still of course to increase project size. This will increase profits without any corresponding increase in control.

Finally the interest rate in equilibrium reflects competition amongst banks for funds and its value is unaffected by a change in entrepreneur wealth. The equilibrium must still lie on the bank’s zero profit constraint and declining marginal utility of income ensures \( C^* = 0 \).

ii) For borrowers a higher likelihood of success increases borrowing and project size if the risk aversion effect dominates the income effect.

Only if borrowing is an inferior good will a fall in borrowing be possible.

Non-borrowers may under these conditions be induced to borrow as the likelihood of success increases.

A higher likelihood of success reduces the interest rate on the risky project.

Borrowers
For borrowers a larger success probability reduces the profit compensation required for an extra \( f \) of borrowing if the individual is to remain indifferent. Thus the slope of the indifference map in \( (L,F) \)-space decreases. For a fixed profit function \( F(K) \) the effect is to induce more borrowing consequent on the reduced psychic cost. A higher \( p \) in turn reduces the equilibrium interest rate paid by the business. Since the indirect profit function \( F(L^*) \) is increasing in \( p \) an expanded budget constraint is associated with the higher \( p \). Further borrowing will now occur if the income effect (higher \( F \)) is positive, and less if it is negative. Only if bank borrowing is an inferior good will there be the possibility of a fall in borrowing as the success probability increases.

Finally, since a higher likelihood of success makes the bank’s expected profits positive at the old interest rate \( \alpha \), \( \alpha \) must fall to restore equilibrium.

Non-borrowers
A greater success probability turns a tangency at the \( F \)-axis into an interior tangency thereby turning a non-borrower into a borrower. However the same (small) change does not convert an inequality into an equality. Hence in the latter case borrowing
will not be induced.

iii) An increase in capital productivity (via $\delta$) will induce borrowers to borrow more. However non-borrowers will never be induced to become borrowers. Changes in capital productivity will not affect the equilibrium interest rate.

**Borrowers**

For fixed control-aversion (MRS), an increase in capital productivity at the margin increases borrowing as the net profitability of borrowing ($R' - \alpha$) rises above its cost ($-U_r/pU_r$). However more productive capital also increases profits (shifting the $F(K)$ function upwards) and reduces the marginal utility of profits, thus increasing control-aversion (MRS) at the old equilibrium. The effect of increased capital productivity on borrowing is thus positive whereas the effect of increased control-aversion is negative. The effect of a higher income is of course ambiguous. If however the income effect is negative (borrowing is inferior) and control-aversion substantial, the effect of higher productivity may be to reduce borrowing as the entrepreneur can now finance her current income with less control. Thus the effect may be the same as an increase in wealth.

**Non-borrowers**

$F(K) = R(K|\delta) - \alpha L - rW$ shifts upwards and becomes steeper at the $F$-axis as $\delta$ increases. Since the MRS is increasing in $F$ this movement converts an equality of the MRS with the slope of the budget into an inequality and sharpens a pre-existing inequality. Thus borrowing is not induced by a shift in the revenue function.

iv) A higher safe rate of interest increases the interest rate on risky projects.

A higher safe rate makes the bank's competitive profits negative at the old risky rate $\alpha = rp$. Hence the risky rate must rise to restore equilibrium.

5. **DYNAMICS**

We now allow for the evolution of attitudes to control through time. This dynamic reflects the fact that the growth of a business is a growth in the attitudes of the original owner-manager from a person suspicious or fearful of outside interference into a person recognising the importance of outside involvement as a precondition of expansion. In the present model this change of attitudes can be represented by a respecification of the utility function and by adding a temporal dimension to the preference parameter. For example a utility function of the form
implies

\[ U_L = -(\theta - \bar{\theta}) e^{-(\theta - \bar{\theta})L} > 0 \text{ as } \theta_L < \bar{\theta} \] (12)

Businesses may then be divided into two types, Movers and Stayers, distinguished by whether their preferences evolve ('grow') through time or remain stationary. The former category either never borrow or do so only to a very limited extent ($\theta > \theta$, all $t$). The latter begin life in this way but later start to borrow to fund desired expansion ($\theta > \theta$, for $t < t$ but $\theta = \theta$ for $t > t$). This is behaviour shown in Figure 5, where $\theta(t|s)$ and $\theta(t|m)$ are the time functions for the preference parameter $\theta$ for Stayer and Mover respectively. The implication is that Movers will increase borrowing through time until the profit-maximising preferences are attained. Stayers however will remain control-averse, and be largely independent of control, but also find themselves in charge of non-growing businesses.

7. CONCLUSIONS
We have shown that if wealth is regarded as productive and disutility of control is included in the owner utility function a model of small firm borrowing can be generated that provides an explanation of non-borrowing and non-growth without recourse to the familiar arguments from asymmetric information. Non-borrowing arises from the balancing the marginal advantage of higher income against the marginal disadvantage of bank 'interference' that borrowing to achieve this income necessitates. If also entrepreneurial attitudes towards control evolve through time then firms may be classified into two groups, Movers and Stayers. The latter will borrow little if at all throughout their lifetime and will be low-profit enterprises. The former will progressively borrow to finance expansion and will be high-profit enterprises. The model developed here thus provides a significant advance on the essentially large-firm, static, profit-maximising models of borrowing presented in the literature and yields a plausible, alternative explanation of small-firm behaviour.
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FIGURE 1: EQUILIBRIUM BORROWING WITH DISUTILITY OF CONTROL
FIGURE 2: EQUILIBRIUM INTEREST RATE AND COLLATERAL LEVEL
FIGURE 3: EFFECT ON BORROWING OF A CHANGE IN INITIAL WEALTH
FIGURE 4: THE EVOLUTION OF PREFERENCES TOWARDS CONTROL