Regional Determinants of Small Firm Loans Under the U.K. Loan Guarantee Scheme

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ABSTRACT. The Loan Guarantee Scheme was initiated in 1981 in order to alleviate a perceived constraint in the ability of small firms to secure bank finance due to a lack of collateral. This paper shows that a national small firms support scheme has, at the point of delivery, had quite different coverage across regions. Briefly, the initial evidence suggests that the Northern regions of England have been the major net beneficiaries of the scheme, primarily at the expense of Northern Ireland and Scotland. Further analysis identified house prices as the single most important determinant of loan size, acting via a collateral effect. On loan numbers and value, fixed regional effects were dominant particularly in the South East and North West.

1. Introduction

The Loan Guarantee Scheme (LGS) was set up in 1981 in order to fill a perceived gap in the financing of smaller firms. It was designed specifically for firms who were constrained in terms of their ability to borrow from banks by a lack of collateral. However, as Harrison and Mason (1986, p. 536) point out, 'Concern for this situation in the United Kingdom can be traced back to the Macmillan Report which commented in 1931 that '*great difficulty is experienced by the smaller and medium-sized business in raising the capital which they from time to time require*.' Yet despite a number of subsequent reports highlighting problem areas in the external financing of small businesses (see for example the Radcliffe Report, 1959, and Bolton Committee, 1971), little was done to address this issue until evidence from the Wilson Committee (1979) suggested that smaller firms were still disadvantaged in the market for loan capital when compared with larger firms.

In the light of this, the incoming Conservative government introduced the LGS in June 1981 on a pilot basis. The scheme has, in the intervening years, been subject to a number of revisions both in terms of it's eligibility criteria and it's parameters, yet still remains an important constituent of the governments small firms policy. To date, £1.4 billion in loans have been issued under the schemes auspices to in excess of 43,000 small firms.

The plan of the paper is as follows. In the next section we briefly review some of the key issues concerning the financing of smaller firms, before focusing specifically on the LGS in section III. Section IV concerns itself with the regional importance of the LGS and highlights some of the disparities in take-up of the scheme across regions. This is, in part, intended as an update of the Harrison and Mason (1986) paper which analysed the first four years of the schemes operation in a regional context. The value of doing so is that we are not only adding to the existing stock of knowledge, but that we can also look at variations in the pattern of regional LGS lending over a longer period in the life of the scheme to date. In section V, we present a series of pooled regressions with fixed and random effects which explain some of the regional variation in LGS take-up and loan value. A short summary is subsequently provided identifying the key findings of the analysis.

Final version accepted on May 12, 1997

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2. Issues in small business finance

A not inconsiderable volume of literature relating to bank lending, particularly in a small firms context, has focused on the role that imperfect

Small Business Economics **11**: 155–167, 1998.

information or informational asymmetries might play in the determination of bank lending contracts (see for example Sharpe, 1990, and Besanko and Thakor, 1987). The seminal work of Stiglitz and Weiss (1981) alludes to the possibility of credit rationing where information asymmetries are present. Here we refer to the fact that firms may be party to pertinent information that the bank does not possess which would otherwise help the bank in assessing more accurately the credit-worthiness of the firm.

At the centre of this debate is how banks' perceive risk and what actions they take to deal with it. Consequently, the development of contingency contracts, which involve the posting of assets as security on bank loans tend to be favoured by banks. U.S. evidence from Berger and Udell (1990) found that, 'nearly 70% of all commercial loans are made on a secured basis', whilst Cowling (1995), using U.K. data, found, 'that 78% of loans were in fact collateralised in 1991 and that this proportion had increased since the 1980's.' (see Binks et al., 1988, 1990 for empirical evidence). Here collateral can be seen as a means of insuring the bank against the higher probability of loan default associated with smaller firms.

So how do informational problems and asset based lending affect the smaller firm? Petersen and Rajan (1992) outline a scenario where, with information asymmetries present and agency costs are high, 'capital may not flow to borrowers with productive investment opportunities.' Empirically, Cowling (1995) found that in 14% of cases where the small firm owner believed there to be significant informational asymmetries with a prospective lending bank, a loan request was refused. This was double the refusal rate of firms who believed that no such asymmetries existed, and consistent with U.S. evidence from Buck, Friedman and Dunkleberg (1991) who found that loan refusal rates over the 1980's varied between 6% and 22%.

On this, Harrison and Mason (1986), developing a theme identified in Binks (1979), argue that, 'growing small firms rapidly exhaust the finance available to them,' and thus become constrained in their ability to respond to discrete changes in demand. This occurs as their capital requirements quickly outstrip their asset base. They also identify a further potential problem area for smaller, and more specifically younger, firms who are likely to generate negative early cash flows and, 'are unlikely to generate sufficient (if any) retained profits to finance the significant increases in turnover and the capital base required for expansion.' (p. 536).

As to why small firms are reliant upon banks for the vast majority of their external financing requirements, Petersen and Rajan (1992) suggest that, 'firms may borrow from a single lender because it is their only source of credit.' Here we reject venture capital as a potential source of funding on two grounds. Firstly, on the basis of the high fixed costs associated with arranging finance of this type which may militate against the smaller firm, or as Harrison and Mason (p. 537) point out, 'most venture capital companies . . . are reluctant to undertake the additional administrative costs of making small investments in smaller and more risky businesses.' Secondly, there is a significant amount of evidence that points to the apparent reluctance of small firms to 'open-up' their capital to outsiders and forfeit their independence and control (see for example, Dow, 1992 and Binks et al., 1992).

On the role of banks', Cowling and Sugden (1995, p. 95), using empirical data, found, 'a degree of support for the notion that full collateral frees credit to firms that would otherwise find it difficult to raise external funds.' Thus emphasising the importance of assets as a determinant of ones ability to raise bank loans. As Binks and Ennew (1995) state, 'Where finance gaps exist, potential viable growth may be foregone,' which leads us into Section III where we outline the rationale for the LGS.

3. The loan guarantee scheme

The Wilson Committee (1979) recommended such a scheme on two grounds:

> (i) "The first would be if there were reason to believe that competition between the banks in this area was insufficiently ineffective to ensure that viable small businesses always had the necessary access to sufficient funds on reasonable terms."
>
> (ii) "The second would be if it were felt that the public return from the activities of small firms was greater than the private benefit because of, for example, their importance to job creation."

With these considerations in mind, the scheme was initiated in 1981 to fulfil three objectives. In the first instance the scheme would directly, 'facilitate an increase in the numbers of both business start-ups and expansions' (Cowling and Clay, 1995, p. 142) and secondly it was designed to encourage banks' to shift away from asset based lending towards a more involved customer-client relationship based on mutually beneficial information exchanges. Finally, a key policy goal was to generate jobs in a cost effective manner.

Operationally, the government provides a guarantee to the bank on loans which the bank deems viable propositions but which are rejected for lack of asset cover. Applications are made directly to banks and final approval is given by the DTI. In addition to the guaranteed percentage, the borrower also pays an interest rate premium to the government in addition to those costs imposed by the bank. In the case of loan default, the government compensates the bank for the outstanding amount of the proportion guaranteed. On duration, the maximum length of loan available is seven years with a maximum loan of £250,000 currently available to existing firms. Furthermore, inner city borrowers face lower premiums. Table I outlines changes in the two key parameters of the scheme, namely the interest rate premium and the guaranteed percentage over time

Thus, for a firm borrowing under the LGS in 1981 the government would provide a guarantee to the lending bank covering 80% of the loan value. In return for providing this guarantee a premium of 3% would be charged in addition to the interest rate charged by the bank. By 1984 however, lending conditions on the scheme had become more costly for borrowers who now faced a premium of 5% and a lower guaranteed percentage at 70%. Whilst these changes were a reaction to the inability of the scheme to become self-financing (an original goal) and to the higher than expected failure rates on the scheme, they nearly brought about it's downfall with take-up rates falling to a low of around 40 loans per quarter from an earlier peak of 1600 loans per quarter (see Cowling and Clay, 1995, p. 144). This virtual cessation of the scheme probably reflected two effects. On the part of small firms the premium of 5% over and above that which they were already charged by the bank was simply too expensive. For banks, the reduction in the guarantee from 80% to 70% meant that they had to bear a much greater proportion of the risk and with failure rates between 25% and 40% lending under the scheme became too risky. The subsequent favourable changes in 1986 and again in 1993 effectively revitalised the scheme by making it more attractive to borrowers and banks.

TABLE I
Parameter changes on the LGS

Phase	Duration	Guarantee (%)	Premium (%)
I	June 1981–May 1984	80	3
II	June 1984–Dec 1984	70	5
III	Jan 1985–March 1986	70	5
IV	April 1986–March 1989	70	2.5
V	April 1989–June 1993	70	2.5
VI	July 1993–	70 or 85*	1.5 or 0.5**

* 70% applicable to new firm borrowers.
** 0.5% margin applicable to existing firm borrowers.
Source: Department of Trade and Industry.

On the distribution of loan size (Table II), on average there appears to be a fairly even spread of loans up to £100,000. However, there is some evidence of a tendency for the share of the smallest loans to rise in periods of economic downturn. Indeed, there is a distinctive inverted 'U' shape for loans in the £0–10,000 category between 1990 and 1994. Conversely, mid-range loans (£20–50,000) tend to act pro-cyclically. An interesting feature is that larger loans appear to be forming a much greater proportion of total loan issued as the maximum loan size is increased. On this, Cowling and Mitchell (1997) argue that, 'This is particularly important as it suggests that the so called 'gap' in the financing of smaller firms is not confined to relatively small loans for start-up firms. This is evidence that there is another 'gap' which operates at much higher levels and is more likely to act as a constraint on existing firms looking for development capital.'

On loan duration, Table III suggests that the LGS has given small firms the opportunity to borrow over the medium to long-term which may not have been possible if we accept the argument that U.K. financial markets operate with a short-term perspective and have an aversion to providing so called 'patient money'. A key feature

TABLE II
Loan size distribution, 1987–1994

£'000s	0–10	10–20	20–50	50–100	> 100
1987	2.8	19.6	45.3	32.3	n.a.
1988	25.3	28.7	25.2	20.9	n.a.
1989	22.9	27.9	26.5	17.8	5.0
1990	25.5	32.1	23.9	13.4	5.1
1991	30.2	32.1	22.5	11.1	4.1
1992	35.1	30.9	20.0	9.4	4.7
1993	26.3	30.9	23.7	11.0	8.1
1994	16.9	25.8	31.4	14.5	11.4
Average	23.1	28.5	27.3	16.3	6.4*

* Only includes loans from 1989–1994 due to changes in the maximum loan threshold.

TABLE III
The duration structure of LGS lending, 1987–1994

Years	0–2	2–3	3–4	4–5	5–6	6–7
%	10.6	15.5	5.9	28.8	3.0	36.2

Source: Department of Trade and Industry.

of the scheme may be that it has also encouraged small firms to take out loans over the longer term, thus spreading interest repayments and reducing the per period debt financing burden.

The evidence suggests that the LGS has been equally successful in supporting start-up firms and existing firms (see Table IV). In terms of the patterns of LGS lending to new and existing firms, it is apparent that new firms take out smaller loans and vice-versa for existing firms. However, it is interesting to note that the scheme has, apparently, given some start-up firms the ability to borrow quite significant amounts that it is unlikely that banks would have provided in the absence of the scheme.

TABLE IV
New and existing firm loans by loan size, 1987–1994

£'000	0–10	10–50	50–250	% of total
New	29.1	54.0	16.9	44.9
Existing	19.6	56.2	24.0	55.1

Source: Department of Trade and Industry.

4. The Regional importance of the LGS

With the exception of the work of Harrison and Mason (1986a, 1986b), little work has been done to assess the regional impact of government support schemes to small businesses, although Ennew and Binks (1993), Hutchison and McKillop (1990), Dow (1992) and more recently Clay and Cowling (1996) have all considered various aspects of regional financial markets, in particular the role of banks. The exception being the U.S. work of Rappaport and Wyatt (1990, 1993), who considered regional aspects of loan guarantees from a bank perspective. The great plus about their studies is that they has access to data on loans per bank and value of loans by bank. This is not available in the U.K. Further U.K. work by Mason and Harrison (1991, 1995) and Mason (1987) has focused on regional aspects of informal equity investment and venture capital.

In terms of the regional impact of small firm policy support schemes such as the LGS, there is a considerable conflict of opinion. For example, Storey (1982a) and Martin (1985) argue that those regions that are already exhibiting greater entrepreneurial activity are precisely those regions which have an environment conductive to new

TABLE V
Regional distribution of loans by numbers and value

Region	Number	(%)	Value £m	(%)	Average loan size
North East	1013	4.7	27.23	4.0	26,881
North West	1924	8.9	57.09	8.4	29,673
Yorks and Humber	1557	7.2	47.59	7.0	30,565
West Mids	1693	7.8	50.31	7.4	29,716
East	2523	11.6	77.49	11.4	30,713
South East	7393	34.1	252.8	37.1	34,194
South West	3162	14.6	91.09	13.4	28,808
Scotland	1091	5.0	50.6	7.4	46,379
Wales	1198	5.5	38.7	5.7	32,304
N. Ireland	145	0.7	7.71	1.1	53,172
Total	21699	100.0	680.61	100.0	31,366

firm formation and thus are more likely to observe higher scheme take-up rates. However, given that the LGS is aimed specifically at those firms which are constrained by a lack of collateral, one might argue, as Mason and Harrison (1986a) indeed do, that take-up is likely to be higher in relatively deprived regions where general levels of wealth and certainly house prices are lower. Thus although we might hypothesise that the pool of potential entrepreneurs is higher in the South East, for example, we might also expect that these individuals will have more wealth and thus be less constrained in their ability to attract external funding from banks. The role of regional macro-economic activity and housing wealth is tested across regions in the subsequent regression analysis. Before this, however, we will present data on the regional distribution of LGS loans by number and region for the period 1989–1994. This data is presented in a way that is comparable with that in the original Harrison and Mason (1986) paper.

As expected, the South East accounts for the largest numbers of LGS loans issued and by value. Furthermore, this proportion appears to have remained roughly constant since the 1981–84 period. The interesting feature is that the next most important beneficiary of the scheme between 1989 and 1994 was the South West whose share had increased from 8.9% in the earlier period to 14.6% in the current period. Previously the North West was the second major beneficiary at 13.1% by numbers falling to 8.9% over the current period. The least important beneficiaries measured by loan numbers, ranked in order of insignificance, were Northern Ireland, North East, Scotland and Wales. Measured by values of loans, the pattern is broadly similar with the notable exceptions of Scotland and Northern Ireland, both of whom benefited from a higher proportion of LGS money than they did in simple numerical terms. Indeed the average loans sizes for Northern Ireland and Scotland respectively were £53,000 and £46,000 compared to an overall average of only £31,000.

Compared with the 1981–84 period measured by Harrison and Mason, there have been some important regional shifts in the impact of the LGS. Briefly, the losers in numerical terms have been the North West and Scotland and the main beneficiary has been the South West and to a lesser extent Wales and the North East. Measured by loan value once again the big loser was the North West and to a lesser degree the West Midlands. The beneficiaries in this case were the South West, Wales and Scotland. To investigate this phenomenon in greater detail, we adopt the methodology of Harrison and Mason and calculate location quotients for each region by weighting the regional share of LGS loan numbers and loan value by the stock of VAT registered firms in a given region for a given year. This will permit an investigation of the true regional impact of the LGS over time.

In terms of loans issued, for the three year period between 1989 and 1991 only the North East managed to achieve a consistently higher than proportional share of loans for a consistent period of time although the North West in 1989 and 1990,

TABLE VI
Weighted index of loan numbers and value

Region	1989		1990		1991		1992		1993		1994	
	N	V	N	V	N	V	N	V	N	V	N	V
North East	1.8	1.4	1.7	1.5	1.4	1.3	1.0	1.0	0.9	0.8	0.9	0.8
North West	1.3	1.1	1.3	1.1	1.0	0.9	0.9	0.8	0.8	0.8	0.9	0.9
Yorks and Humber	1.0	1.0	1.0	0.8	0.8	0.7	1.0	0.9	0.9	0.9	1.0	1.0
West Mids	0.9	0.8	0.8	0.8	0.8	0.8	1.0	0.8	1.0	1.0	0.9	0.8
East	0.8	0.7	0.9	0.9	1.0	1.0	1.2	1.1	1.2	1.0	1.2	1.2
South East	1.0	1.1	1.0	1.1	1.0	1.1	0.9	1.0	0.9	1.0	1.0	1.0
South West	1.2	1.0	1.2	1.1	1.7	1.5	1.7	1.5	1.7	1.5	1.7	1.5
Scotland	0.7	1.2	0.6	0.8	0.6	0.8	0.6	1.0	0.9	1.1	0.7	1.0
Wales	1.3	1.1	0.8	0.8	1.0	1.0	1.2	1.3	1.1	1.0	1.0	0.9
N. Ireland	0.3	0.3	0.3	0.5	0.2	0.3	0.1	0.2	0.2	0.4	0.2	0.3

Key: N = numbers, V = value.

Wales in 1989 and the South West in 1991 were over represented for a short period of time. The regions that were under-represented during this period were found to be Northern Ireland and Scotland, the so called peripheral regions. This aspect is interesting as it implies that there was a disproportionate regional impact in terms of the numbers of loans issued between 1989 and 1991 but that it was not a North-South shift but a North East/North West versus Scotland/Northern Ireland beneficiary-non-beneficiary issue. Furthermore, this feature was also clearly identifiable when considered by loan value although the North West dropped out as a net beneficiary.

For the post-1991 period there was virtual parity across regions once the stock of firms was taken into account with two (or possibly three) notable exceptions, these being the South West and Northern Ireland and to a lesser degree Scotland. On this, the South West was a significant net beneficiary of LGS loans in numerical terms and by value, receiving around 70% more than it's weighted share of loans by number and 50% more than it's share by value. By contrast Northern Ireland was a huge net loser on both measures receiving only 10%–20% of it's weighted share of loans by number and 20%–40% of it's weighted share by value. There is also some evidence to suggest that Scotland is a net loser in terms of a less than proportionate share of loans in numerical terms. However, this feature was not apparent for Scotland when measured by loan value.

Interim summary

(i) The South East dominates in terms of it's share of total loans issued, but this is proportional to it's higher stock of firms over time.
(ii) The South West has increased it's proportional share since 1981–84, the period analysed in the original Harrison and Mason work in this area.
(iii) Scotland and Northern Ireland have the highest average loan size.
(iv) The North West and Scotland have observed a net decline in their share of loans since 1981–84.
(v) There are disparities in the regional distribution of loans but not as expected in a North-South way, but in a North-Scotland/Northern Ireland way to the net benefit of the North.
(vi) There is also evidence to suggest that, for the most part, regional disparities are being reduced over time.

5. Pooled regression estimates of regional determinants of LGS lending

To explore further the reasons for the apparent disparities across regions in the pattern of LGS lending, we elected to pool our data which was cross-sectional across regions and in time-series form over the period 1981–1992. This methodology was used to reflect the relatively short time-series (the data was annual) and to enable us to

estimate more parameters. We are left with a pooled regression with 10 regional observations for each of the 12 years annual data, a total of 120 observations. In addition the data was available for both the numbers of loans issued, the value of loans issued and the average loan size. With this in mind separate regressions of the form;

$$Y_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3it} + \text{Regional Dummies} + \text{Time Dummies} + u_{it}$$

Here, the X's are the hypothesised explanatory variables and the β's are coefficients. We also include 9 regional dummies and 11 time dummies to take into account the fact that the model may not exhibit temporal stability or cross sectional stability. We also assume that the error term in the model has the usual OLS properties across time and cross sectionally. With respect to the regional dummies, we use Northern Ireland as our base region and no dummy for this region is included in the model. Thus when interpreting the coefficients on the regional dummies we are simply saying that each region has certain characteristics that either raise or lower it's intercept term above or below that level recorded by Northern Ireland. In a similar fashion, we use 1981 as our base year to which all other time periods are related to. This captures time specific components of the analysis.

To clarify what exactly we are seeking to estimate, we are saying that theoretically we believe that our X variables are related to observed changes in LGS loans. These are random effects. However, we also include our regional dummy variables and a series of time dummies. These are called fixed effects and are fixed either within region or at a particular point in time. What we are then left with is our hypothesised explanatory variables (the X's) which, having controlled for region and time specific effects will explain the variation in LGS lending.

In terms of our explanatory variables, we were careful not to identify too many parameters given the nature of our pooled data. The variables selected were Gross Domestic Product (GDP), stock of VAT registered firms (VATST), new VAT registrations (VATR) and house prices (HP). In line with Keeble and Walker (1994) we adopted a standardisation procedure by weighting new VAT registrations by the existing stock of firms. All data was collected on a regional basis. As to the rationale for our explanatory variables, GDP is intended to capture macroeconomic effects which might increase or decrease our wealth and general well-being, whilst the stock of firms (VATST) has clearly defined numerical connotations which as we saw from the South East has positive and direct effects on the proportional loan take-up across regions. Regarding new firm registrations, and given the prior discussion of banks' attitude to risk and lending to firms without a track record particularly when they lack collateral, one might expect that high levels of new firm registrations (as a proportion of the total stock) has a positive effect upon take-up of LGS loans. The inclusion of house prices is intended to capture housing wealth effects which might increase individuals ability to provide collateral against bank loans. However, if increases in housing wealth also raise the number of individuals who enter into business then the effect is less clear.

6. Pooled regression estimation and results

Before estimating the regression models, there are a number of econometric issues that need addressing by appealing to the data. The first concern is that of potential endogeneity of new firm registrations with the dependent variable, which in the most obvious case is that of loan numbers. To resolve this a Wu-Hausman Test statistic was calculated using the standard Instrumental Variables methodology. Here the residuals from an initial regression using the potentially endogenous variable as the dependent variable are then saved and put back into the original regression and tested for significance. The test statistics imply strong exogeneity of new firm registrations, t-ratio = 0.430, probability 0.667. In many ways this is not surprising since the LGS accounts for only 1.5%–3% of total small business lending, or approximately 12% of new firm lending.

The second issue is that of potential correlation between house prices and new firm registrations. On this there is considerable disparities across regions. For example, in Northern Ireland the correlation was small and negative. By contrast in the North West the correlation was of the order 0.46 much greater than the 0.09 recorded in the

North East and the 0.14 recorded for the West Midlands. Yet taken as a whole, the correlation's do not suggest that house prices are particularly related to new firm registrations to any great extent. On this basis we incorporate both variables in the regression models.

In terms of our modelling strategy, it is important for our interpretation of the role of regions in determining LGS numbers, value and loan size to know whether we find fixed or random effects. This determines the role of our hypothesised regional effects. If the data supports fixed effects, then our regional dummies can be interpreted as a fixed coefficient (constant) for each region. If the data supports random effects, then these regional effects can be seen to act via the slope coefficient for each region.

Loan value

LM Test vs Random Effects Model = 289.315 (2 d.f., prob = 0.0000001)
Fixed vs Random Effects (Hausman) = 8.09471 (4 d.f, prob = 0.0881)
Estimated Autocorrelation of $e(i, t)$ = 0.2029

Loan numbers

LM Test vs Random Effects Model = 276.619 (2 d.f, prob = 0.0000001)
Fixed vs Random Effects (Hausman) = 14.02516 (4 d.f, prob = 0.007215)
Estimated Autocorrelation of $e(i, t)$ = 0.3905

Using a two-way test approach, the results in both cases support the fixed effects hypothesis, although this result is far stronger for loan numbers than loan value.

Econometrically this can be interpreted as a justification for allowing our fixed regional dummies to be defined as a means by which the intercept term is shifted along the loan numbers or loan value axis for each region. In doing so we reject the hypothesis that the regional effects are random and can be interpreted as a regional slope coefficient. Here we are saying that the fixed regional effect acts on the mean of the dependent variable within regions.

The initial two models presented show that there are considerable regional fixed effects for loans issued and loan value. In both models, all regional dummies were found to be significant. The interesting feature of this component of the analysis is to examine the relative magnitudes of the regional effects. This will give an important insight into possible variations in terms of how the LGS is administered and promoted and its relative importance as a source of debt finance for firms across regions. It might also imply something about the relative distribution of LGS/non-LGS lending in banks' portfolios across regional financial markets. The magnitudes of the fixed regional coefficients for loan numbers and value are presented in Figure 1 below.

The coefficients show that the fixed regional dimension is far more important in determining numbers of loans issued than the total value of loans issued. This was found to be true for all regions. The fixed regional effects, ranked in order of importance for loan numbers are; South East, North West, South West, West Midlands, Yorks and Humberside, East, Scotland, Wales and the North East. This implies that there are some important region specific factors inherent in the South East in particular, that holding all other factors constant will always mean that the number of LGS loans issued to firms in the South east will be higher. These region specific effects are considerably less important in, for example, the North East, although the fixed effect was still greater than that of Northern Ireland on this measure.

On loan value, once again all regional fixed effects were found to be positive and significant, although generally of lower magnitude than reported on loan numbers. This suggests that whilst the likelihood of receiving an LGS loan is

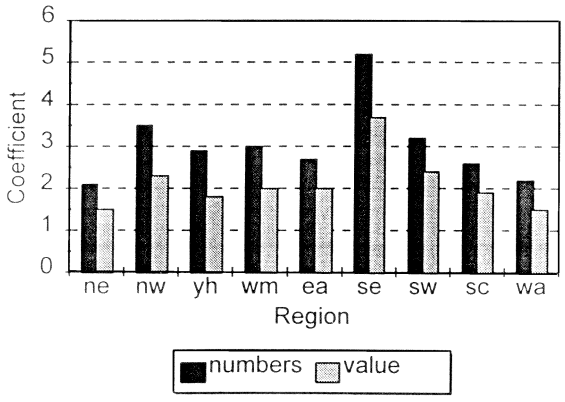

Figure 1. Fixed regional effects.

TABLE VII
Regression results

Dependent variables	Loan numbers		Loan value		Average loan size	
	β	T-stat	β	T-stat	β	T-stat
GDP	0.194	0.621	0.262	0.937	0.673	0.467
VATST	–0.727	–1.433	–0.166	–0.367	0.560	2.402
VATR	–1.244	–1.758	–0.582	–0.921	0.662	2.034
HP	0.62	1.514	–0.193	–0.523	–0.822	–4.306
Time dummies						
1982	0.820	5.277	0.722	5.209	–0.974	–1.363
83	0.650	3.844	0.560	3.710	–0.900	–1.156
84	–0.333	–1.990	–0.337	–2.256	–0.404	–0.052
85	–1.699	–9.458	–1.686	–10.517	0.125	0.152
86	–1.087	–5.179	–0.827	–4.416	0.259	2.688
87	–0.799	–3.123	–0.568	–2.490	0.230	1.957
88	–0.183	–0.552	–0.154	–0.520	0.291	0.191
89	–0.300	–0.079	0.162	0.481	0.192	1.105
90	–0.162	–0.430	–0.103	–0.031	0.151	0.875
91	–0.582	–1.544	–0.349	–1.039	0.232	1.339
92	–0.852	–2.101	–0.635	–1.754	0.217	1.164
Regional dummies						
North East	2.101	4.552	1.481	3.596	–0.619	–2.917
North West	3.508	4.349	2.301	3.196	–1.207	–3.253
Yorks and Humberside	2.872	4.138	1.806	2.914	–1.066	–3.339
West Midlands	2.998	4.281	1.988	3.181	–1.009	–3.133
East	2.755	4.512	2.023	3.711	–0.732	–2.606
South East	5.163	4.179	3.705	3.359	–1.4582	–2.565
South West	3.218	5.070	2.367	4.179	–0.850	–2.913
Scotland	2.622	4.157	1.854	3.293	–0.767	–2.646
Wales	2.157	5.213	1.528	4.137	–0.629	–3.304
R^2	0.93		0.94		0.65	
N	120		120		120	

considerably influenced by the region in which the firm is located, the actual value in total of loans made is less determined by location, although it still remains an important factor.

There are also some re-ordering of the rankings for loan value. For example, the North West traded places with the South West (up from 3rd to 2nd). Furthermore, the East moved from 6th to 4th, and Scotland from 7th to 6th. The regions that were found to have less important regional fixed effects on loan value were the West Midlands, down from 4th to 5th and Yorks and Humberside, down from 5th to 7th. Interestingly, the South East effect was predominant on both measures by a considerable margin. By contrast, the North East and Wales were both unchanged in 9th and 8th places respectively.

As to what these results might imply about the nature of LGS lending across regions, it certainly appears that the LGS is significantly more important in the South East, and to a lesser extent in the North West and South West. Conversely, in Wales, the North East and Northern Ireland the importance of the LGS is considerably less. There are three areas which merit consideration. The first being the way in which banks' promote the scheme across regions. On this, the implication being that considerably more resources are devoted to promoting the scheme in the South East, North West and South West than in Wales, North East and Northern Ireland for example. It might also be that in a number of regions bank lending officers or indeed firms are simply not aware of the scheme.

The latter is potentially a strong argument for the apparent dominance of the South East and North West which are both important regional, and in the case of the South East international, financial centres. Yet the same could not be argued for the South West, which by comparison is a peripheral region. Also, we might anticipate that Scotland, which contains one of the largest financial centres in Europe based in Edinburgh, should feature here.

A second issue is that of access to more conventional debt finance, or non-LGS lending. Here it could be argued that in regions where debt finance is more readily available to small firms, that the pool of unfilled loan requests is smaller. Thus the proportion of LGS to non-LGS lending in a banks loan portfolio will be correspondingly lower.

The counterpart to this argument is that of the quality of funding proposals received, or indeed on a wider scale differences in the 'survivability' of firms across regions. It is important to note here that an LGS loan can only be issued to firms with a 'viable' lending proposal which has been turned down due to a lack of suitable asset cover.

In short, we have identified clear and significant differences in the usage and importance of the LGS across regions. These differences cannot be explained by changes in GDP, movements in house prices or the stock and inflow of firms alone. The critical factor is that the LGS is a national scheme, with the same requirements and lending conditions for all firms, irrespective of geographical location. Yet we observe, in some cases, extremely large, and fixed, regional effects which act to significantly increase or reduce the average number of loans issued and the total value of loans in a given region.

Moving on to consider the time pattern, we can observe from Figure 2 that there are some important variations in the number and value of loans issued over the twelve years measured. Broadly speaking, there is a fairly consistent time pattern to the variation in loan numbers and value, using the first year of the LGS as the base year (1981 = base), the subsequent two years were both found to have a positive and significant effect on both measures of activity. This is perhaps not surprising in that the introduction of such a scheme may take a considerable amount of time to become operational at the branch level of the banking system. More generally, the scheme also required a change in accepted bank practice and culture.

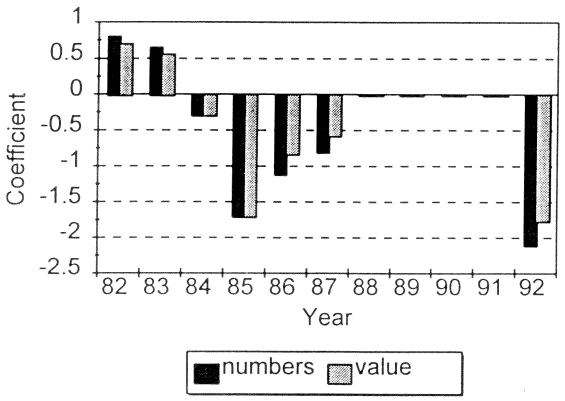

Figure 2. Time effects.

Yet by 1984, there was a significant and negative effect which remained until 1988. This was a particularly important period for the LGS, and one in which the parameters were changed twice. In 1984, the guarantee was lowered from 80% to 70% and the premium raised from 3% to 5%. In the first case the reduction in the proportion of the loan guaranteed made it riskier for banks who, in the event of default, were liable for a greater share of the outstanding debt. In the second case, the rise in premium added to the total borrowing costs of LGS funds substantially. Not surprisingly these changes marked a large decline in LGS activity. In fact the scheme declined to such an extent that it was bordering on closure with take-up down to 40 loans per quarter from a previous high of 1600 loans.

However, in 1986 conditions were relaxed once again and the premium was reduced to 2.5%, its lowest level since the LGS started. The interesting feature of the time effects of LGS activity are that the downward trend (although still positive at this point) began in the 1982–83 period which predates the June 1984 (unfavourable) parameter changes. In a similar fashion the upward (although still negative at this stage) trend began in the 1985–86 period, prior to the April 1986 (favourable) parameter changes. Furthermore, between 1988 and 1991 there were no discernible time effects. Subsequently the time effect became negative and significantly so in 1992.

From Figure 2 it is apparent that the 1984

changes had the largest single effect, acting to reduce numbers and value of loans issued. By comparison, the premium revision in 1986 had a much smaller effect. This suggests that the guarantee is the more influential determinant. This may also explain why no time effects were recorded between 1988 and 1991 when the schemes parameters remained constant, although it clearly cannot explain the negative coefficient for 1992.

Concerning our random effect, there is little evidence that individually movements in GDP, house prices, the stock or inflow of firms had any significant effect at the 5% level. Yet as a group, the hypothesis that these variables influenced the regional variation in LGS numbers and value could not be rejected. Thus they remain in the models.

We now turn our attention to modelling variations in average loan size across regions. From the basic data we observed that Northern Ireland had by far the largest average loan size at £53,172 compared to an overall average of £31,366. This aspect of the LGS is important in that it might offer insights into regional differences in bank lending policies, and the ability of the LGS to address a fundamental concern, that of easing smaller firms access to debt finance. To this end our prior is that we would expect to see a much more important role for house prices via a collateral effect and our other regional macroeconomic indicators than was apparent on loan numbers and value.

The procedure adopted was to initially test for fixed or random effects as before. The test statistics are reported below and offer support for a fixed effects model.

Loan size

LM Test vs Random Effects Model = 28.8911 (2 d.f, prob = 0.000001)
Fixed vs Random Effects (Hausman) = 11.18801 (4 d.f, prob = 0.0245)
Estimated Autocorrelation of $e(i, t)$ = 0.30209

On this basis we accept that the model exhibits fixed regional effects and that these can be interpreted via a shift in the constant term, and hence the mean for each region.

In terms of the loan size model results, once again all regional coefficients were found to be significant, but in this case all negative. Once again Northern Ireland was taken to be the base region. From Figure 3 we can observe that regional effects were of the highest (i.e. most negative) order in the South East and North West and lowest in Wales and the North East. This represents a reversal of the results reported for loan numbers and value, where the south East and North West dominated in terms of fixed regional effects.

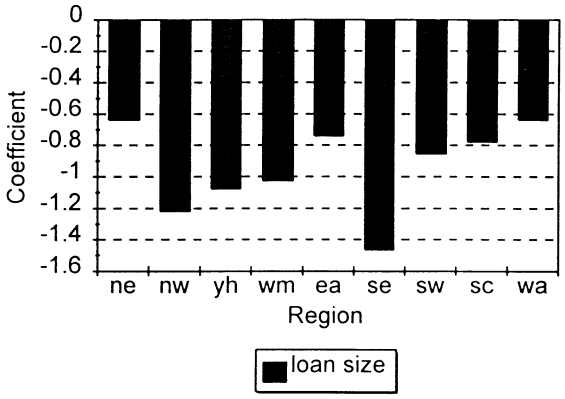

Figure 3. Fixed regional effects.

On the four measures of regional activity, both the firm stock and (standardised) inflows were found to act positively and significantly. By contrast, house prices were found to exert a large, significant and negative effect. This is important in that it implies that upward movement in house prices via a collateral effect or an equity effect helps alleviate credit constraints, thus allowing firms to generate traditional bank loans, rather than seek recourse to the LGS.

Regarding potential time effects, only the coefficients for 1986 and 1987 were found to be significant, both acting in a positive way. This coincides with a reduction in the premium from 5% to 2.5%, which represents a substantial decrease in total borrowing costs under the scheme.

7. Summary

The results suggest that there are strong regional fixed effects that act to raise both the number of loans issued and the total value of loans in all

regions when compared to Northern Ireland. Furthermore, the South East in particular, and the North West and South West to a lesser extent, both have regional specific fixed effects of high magnitude. By contrast, the North East and Wales, although both having positive effects compared to Northern Ireland, had relatively low effects. This implies that there are other factors apparent in the South East, North West and South West that greatly enhance the likelihood of a given firm receiving an LGS loan. This hints at the existence of regional differences in either banks attitude to the LGS or indeed firms awareness of the scheme or a combination of the two.

On the time effects, the results suggest that both firms and banks are particularly sensitive to changes in the schemes parameters. For example, the results for the most part show a positive effect between 1982 and 1983 when the premium was 3% and the guarantee 80%, but a negative effect between 1984 and 1987 when the guarantee was reduced to 70% and the premium raised to 5%.

As to the significance of our four hypothesised explanatory variables in explaining numbers of LGS loans issued and the total values of loans issues, there is fairly consistent evidence. No individual effects were recorded from either of our four regional measures of economic activity. However, on loan size there was evidence that levels of regional economic activity were individually important. For example, as house prices rose this had a negative effect on take-up rates as more and more firms are able to obtain bank finance through an increase in the value of their collateralisable assets.

The role of house prices was found to be an extremely important determinant for the reasons outlined above, but also due to the large degree of additionality of LGS backed loans or complementarity in the provision of part self-collateralised/part-LGS loans. The positive effect on firm stock and inflows might simply be an indicator of resource and environmental munificence as a means of supporting a given stock of firms over time.

To summarise briefly, this study has shown that a national small firms support scheme has at the point of delivery had quite different coverage across the regions. The initial evidence suggested that the Northern regions of England have been net beneficiaries of LGS loans at the expense of Scotland and Northern Ireland. However, there was also evidence that regional disparities were being reduced over time, perhaps as a result of changes in the schemes operation on the part of the clearing banks.

In conclusion, it is likely that the LGS has stimulated small business formation and growth beyond that achievable without the scheme. Yet there is evidence that it is in precisely those regions that have relatively well developed financial markets that the schemes usage is greatest. Arguably the reverse should be true if regional disparities in new firm formation and economic growth are to be reduced. However, the results show that the lowest users in the 1981–1984 period have improved their relative position in the intervening years to 1992, suggesting the scheme has, over time, improved access to finance in a number of regions. But the scheme is still biased towards the major regional financial centres.

There appear to be two factors undermining the schemes ability to stimulate new firm formation and existing firm growth in less developed regions. The first is the very fact that the administration of the scheme ultimately lies in the hands of individual bank lending officials. Thus access to the scheme is at the discretion of these people. Secondly, the schemes parameters, at least in the initial years, were frequently altered, often unfavourably for banks and firms. When there have been periods of relative constancy, the scheme has tended to flourish, and regional disparities have been reduced.

In some ways this reduction in the regional importance of the scheme over time is not surprising as the LGS is a national scheme, with no explicit regional context. Perhaps there ought to be further consideration of how the scheme might dovetail in with wider regional policy deliberations as has been the case to some extent in the U.S. Surely a scheme whose explicit goal is to improve smaller firms access to finance should specifically target those regions where this feature is more of an issue for small firms.

As it is, the LGS constitutes a small, but increasingly important component of small firms financing. The impression is that it could be more effective if policy-makers were more inventive and specific about their targets and objectives.

Acknowledgments

The author would like to acknowledge the considerable support and advise on various versions of the paper given by Peter Mitchell, Martin Conyon, Jeremy Smith, and all participants at Warwick seminars where earlier versions of the paper were presented. In addition, the paper has benefited enormously from the thoughtful and detailed comments from two anonymous reference. I thank them both.

Appendix

Variable list

VATST The stock of VAT registered firms by standard region.

GDP Regional Gross Domestic Product, Factor Cost at constant prices.

VATR New Firm Registrations for VAT by standard region standardised by the regional stock of firms.

HP Average price of all dwellings by standard region.

Source: Regional Economic Trends and DTI.

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