Who Pays Business Rates?

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I. INTRODUCTION

Non-domestic rates are a tax that is formally levied on the occupiers of non-domestic property in the United Kingdom. This does not imply that it is only the occupiers of business and other non-domestic property who are made worse off by the imposition of 'business rates'. Some or all of the effective burden of non-domestic rates may be shifted backwards from the occupiers of business property to the owners of business property. This occurs if the rents that property owners can charge their tenants are reduced by the imposition of business rates. In this case, the total cost of occupying a business property (i.e. rent plus rates) is increased by less than the full amount of the non-domestic rates paid by occupiers, and part of the burden of business rates is borne by property owners in the form of lower rental income than they would otherwise have received. The *effective incidence* of non- domestic rates is then said to fall partly on property owners, and only partly on occupiers.

The extent to which business rates are reflected in lower rents is of considerable importance in understanding the impact of non-domestic rates, since many properties, particularly retail and office properties, are rented rather than owned by the business that occupies them. If it is the case that much of the burden of non- domestic rates is passed on to landlords, then much of the benefit of a reduction in the overall level of business rates would accrue to landlords, and not to the businesses that occupy the property. If this is the case, then cutting business rates would be a poorly-targeted way of helping the business sector.

The system of non-domestic rates was substantially reformed in April 1990. In England and Wales, this reform saw the replacement of locally-varying tax rates (rate poundages) by a uniform national non-domestic rate; at the same time, all properties were revalued to assess the tax base (rateable values) for the first time since 1973. As a result of these two changes, large changes in business rates affected many properties, although the actual impact was cushioned by a transitional relief scheme which limited the size of annual increases and decreases affecting any particular ratepayer. These large changes in business rates provide an unusually informative opportunity to study the impact of non-domestic rates on commercial property rents.

In this paper, we analyse the effects of changes to business rates on a sample of some 2,964 institutionally-owned commercial properties, over the period from 1987 to 1992. Annual data on estimated rental values for these properties were obtained from Investment Property Databank. Information on rateable values before and after the 1990 revaluation was obtained from the Inland Revenue Valuation Office Agency. Together with information on local rate poundages before 1990, and the national non-domestic rate after 1990, this allowed the business rates payable by occupiers of these properties to be measured. This sample therefore allows us to consider how commercial rents were affected by changes to business rates in the two years (and eight months) following the reform of non-domestic rates in 1990.

Our main finding is that properties that experienced an increase in business rates were subsequently observed to have smaller increases (or bigger decreases) in rents than properties that experienced a decrease in business rates. For example, estimated rental values fell by 11.4 per cent on average between 1990 and 1992 in our full sample of 2,964 properties.[2] In the subsample of 2,013 properties where non-domestic rates went up in 1990, this fall was 14.4 per cent on average, whilst in the subsample of 951 properties where non-domestic rates went down in 1990, this fall in estimated rental values was only 5.1 per cent. In principle, this pattern could be explained by regional differences in the impact of the 1990 reform and property price movements, but this does not seem to be the case. Even restricting attention to the subsample of 706 properties in London, we

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[2] An estimated rental value is a valuer's estimate of what a property will currently be let for on the open market. See Section IV for more detail.

find a similar pattern: the average fall in estimated rental values between 1990 and 1992 was 29.3 per cent; for the subsample of 574 properties where business rates increased, this fall was 30.4 per cent; and for the subsample of 132 properties where business rates decreased, this fall was only 24.8 per cent.

It appears that increases in non-domestic rates put downward pressure on rents, whilst decreases in non-domestic rates put upward pressure on rents. In Section V, we report the findings of a regression analysis that quantifies these effects, and also investigates how quickly property rents adjust. We confidently reject the hypothesis that a £1 increase in non-domestic rates (per square foot) has no effect on property rents. After two years, this is associated with reductions in estimated rental values ranging from 45p to 85p per square foot, with the effect being largest in London. In the long run, we cannot reject the hypothesis that rents fall pound for pound with business rates, although it should be emphasised that our sample is short and does not allow the long-run effect to be estimated with any precision. Moreover, our model suggests that it takes several years for this adjustment to be completed.

These results suggest that much of the burden of business rates is shifted on to property owners in the long run. However, the short-run impact of changes to business rates affects tenants more than landlords. This indicates that although lower business rates may be of limited benefit to businesses in the long run, the short-run benefit of transitional relief schemes does accrue mainly to occupiers.

The remainder of the paper is organised as follows. Section II briefly reviews the economic theory of tax incidence, explaining how market forces shift part of the burden of business rates from tenants to landlords, and under what conditions this shifting is likely to be substantial. Section III describes the UK system of non- domestic rates, and in particular the effects of the 1990 reforms. Section IV describes the data used in our study, Section V presents our empirical analysis and Section VI concludes.

II. SOME THEORETICAL CONSIDERATIONS

It is well known that the effective incidence of a tax (who is made worse off by the presence of the tax) can be quite different from the formal incidence of the tax (who actually pays money to the tax authorities). For example, in the case of value added tax (VAT), VAT revenue is paid to the government by retailers, but we are used to thinking of VAT as a tax on consumers since VAT payments are reflected in higher prices charged to consumers. The effective incidence of VAT is thus shifted forward from retailers to consumers.

It is also a standard result that in the long run, the effective incidence of a tax on a commodity does not depend on whether that tax is formally levied on buyers or sellers. Consider the case of National Insurance contributions (NICs), which are levied partly on employers and partly on employees. This result says that in the long run, a switch from employee NICs to employer NICs would not

help workers at the expense of firms. The reason is that employers care about the total cost of employing a worker, including both the wage and the employer NICs, whilst workers care about the purchasing power of their wage, after deducting employee NICs and other taxes. The market wage reflects a balance between total employment costs and the spending power of earnings, and there is no reason why this balance should be affected by the division of NICs between employers and employees. If employer NICs increase whilst employee NICs go down, the market wage will adjust downwards to restore the desired balance between employment costs and spending power. This result does *not* say that all the effective incidence of employer NICs is shifted on to workers;[3] it says that the effective incidence of NICs does not depend on whether they are levied on employers or on employees. This is a long-run result, since it will take some time for market wages to adjust to their new equilibrium level.

The extent to which the effective incidence of a tax falls on buyers or sellers depends on how sensitive demand and supply of the commodity are to changes in its price. For example, if the suppliers of a commodity are taxed, and they pass this tax on to buyers in the form of a higher price, the impact on their revenues depends on how sensitive demand is to the price charged. If demand is very sensitive to price, or price *elastic*, then demand will fall by a lot and suppliers will suffer a big drop in revenues if all of the tax is passed on. Conversely, if demand is not very sensitive to price, or price *inelastic*, then demand will not fall much in response to the price increase and suppliers will be much less affected if they pass on the tax. Other things being equal, the extent to which a tax levied on suppliers will be passed on to buyers will tend to be greater when demand is price inelastic, and less when demand is price elastic.

Extending this standard analysis of commodity taxation shows that the extent to which the effective incidence of a tax falls on sellers tends to be great when either demand is very sensitive to price, or supply is not very sensitive to price; and the extent to which the effective incidence falls on buyers tends to be great when either demand is very insensitive to price, or supply is very sensitive to price.

We can now apply this analysis to considering the impact of non-domestic rates on the market for rented commercial property. Business rates are a tax levied on occupiers, or buyers of rented commercial property. If market rents are unaffected by the imposition of business rates, then the total occupancy costs of rented commercial property increase pound for pound with the level of business rates. In this case, all of the effective incidence of non-domestic rates remains with occupiers, and none is passed on to the landlords, or sellers of rented commercial property.

Our analysis shows that this extreme outcome will only apply if either the demand for rented commercial property is completely inelastic with respect to

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[3] Although empirical evidence does suggest that most of the burden is borne by workers. See Dahlby (1991).

price, or supply is perfectly elastic.[4] Since the demand for commercial property is likely to be sensitive to price at least to some degree, and the supply of rented commercial property is unlikely to be perfectly elastic, this analysis suggests that part of the effective incidence of business rates will be shifted on to landlords in the form of lower market rents.

In this case, the total costs of occupying a commercial property increase by less than pound for pound with the level of non-domestic rates. What our theoretical analysis does not tell us is how much of the burden of business rates will be passed on to landlords. This depends on the size of the demand and supply elasticities in the market for rented commercial property, and is therefore an empirical question. The large changes to business rates that occurred in the UK as a consequence of the 1990 reforms to non-domestic rates allow us to investigate this question empirically.

Two further points should be noted. First, it is likely that both the demand and the supply of rented commercial property will be more sensitive to price in the long run than in the short run, since time allows both buyers and sellers to adjust their behaviour. Over time, properties can be switched from the rented commercial sector to other uses, and/or more properties can be built. Likewise, businesses can relocate or occupy less property in the longer term. This observation does not tell us whether rents should adjust by more or less in the long term than in the short term, since this depends on whether supply elasticities or demand elasticities increase by more with time. However, if it is the case that the tendency of demand to become more elastic over time dominates the tendency of supply to become more elastic over time, then the long-run effect of rates on rents will tend to be larger than the short-run effect of rates on rents.

Second, to the extent that the effective incidence of non-domestic rates is shifted on to landlords, the real losers are not necessarily the current landlords, but rather the landlords who owned properties at the time when business rates were introduced or increased. The effect of higher business rates will be to reduce the rental income from a particular property; but this lower stream of rental incomes will reduce the market price at which commercial properties are bought and sold. Anyone buying commercial properties after the effects of higher business rates are reflected in property prices will receive lower rental incomes, but they will also pay less to acquire their properties, so the return on their property investment will not be affected. The landlords who lose out are those who own the property when property prices are hit by the news of higher business rates. These landlords suffer a capital loss, and the effect of business rates is said to be *capitalised* into property prices. This consideration does not affect our analysis of the extent to which higher business rates are reflected in

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[4] i.e. if a small fall in the level of rents would result in all property being withdrawn from the commercial rented market.

lower property rents, and thus of the extent to which the burden of higher business rates is borne by current tenants. But it does mean that, to the extent that the burden of higher business rates is not borne by current tenants, the statement that the effective incidence of business rates is borne by 'landlords' is somewhat vague; the effective incidence really falls on the property owners at the time when news about (higher) business rates was reflected in property prices.

III. THE 1990 REFORMS TO NON-DOMESTIC RATES

Non-domestic rates are a significant tax levied on UK businesses. In 1992–93, they raised £13 billion, compared to £15 billion from corporation tax. Within the sample of properties used in this study, the average annual rates bill per square foot was over £4 in 1990–91, compared with an average rent bill per square foot of just over £13. This suggests that, within our sample at least, rates bills make up roughly 25 per cent of the total occupancy costs of rented commercial property.

Until 1990, local authorities set an annual rate poundage[5] which applied to all industrial and commercial properties within the local authority area.[6] Local discretion over rate poundages had generated significant variations between the tax rates paid by businesses in different local authority areas, as shown in Table 1. In 1989–90, the final year of locally-varying rate poundages, for example, the authority with the highest tax rate set a rate poundage that was over three times greater than that applying in the authority with the lowest tax rate. Moreover, since revenues from non-domestic rates were not necessarily used to finance local services for business, these variations in tax rates did not necessarily reflect variations in the quantity or quality of local services for business.[7]

In April 1990, central government introduced a major package of reforms to the UK local authority finance system. These included the replacement of locally- varying non-domestic rates by a centrally-determined national non-domestic rate (NNDR) and the first major revaluation of non-domestic rateable values in England and Wales for 17 years.

Until the introduction of the 1990 Valuation List, the rateable values in use in England and Wales still reflected property market conditions in April 1973. This divergence between the pattern of rateable values and developments in commercial property markets meant that the relative tax liabilities of businesses

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[5] The freedom of local authorities to set local tax rates was circumscribed by central government capping powers introduced in the 1985 Rates Act.

[6] Throughout the period, agricultural properties were derated.

[7] Variations in the value of services provided to businesses by local authorities could also affect local property rents, potentially offsetting some of the impact of variations in business rates.

TABLE 1

Variations in Local Rate Poundages, 1987–88 to 1990–91

	Average tax rate	*Standard deviation of tax rates*	*Average of five highest tax rates*	*Average of five lowest tax rates*	*Ratio of highest tax rate to lowest tax rate*
Before revaluation					
1987–88	227.8p	32.4p	329.5p	147.2p	3.0
1988–89	250.4p	35.7p	343.5p	151.1p	3.0
1989–90	271.2p	39.5p	383.3p	153.2p	3.3
After revaluation					
1990–91	34.8p	0p	34.8p	34.8p	1.0

Source: The Rating and Valuation Association, *General Rate Poundages and Products*, various years.

in different regions and sectors of the economy increasingly failed to reflect the actual pattern of property prices prevailing across the country.

As a result of the 1990 revaluation, national rateable value increased by a little over eightfold. Since the 1990 reforms were intended to be revenue neutral in real terms, the 1990 uniform business rate (UBR) was set at approximately one-eighth of the average rate poundage that had been set by local authorities in the previous year. However, this neutral impact on the aggregate yield of the tax masked some very significant changes to the rates bills paid by individual businesses. Within our sample, and before allowing for the effects of transitional relief, some properties faced rates bill increases of over 200 per cent, whilst others faced reductions in rates bills of more than 70 per cent. These changes were a combination of the 'poundage effect' resulting from the move to a uniform rate poundage and the 'revaluation effect' resulting from the introduction of the 1990 Valuation List.

The 'poundage effect' was particularly important for businesses in areas in which local authorities had previously set tax rates that differed significantly from the average for all local authorities. The introduction of the UBR generated large increases in rates bills for those businesses that were located in previously low-spending/low-tax jurisdictions and significant decreases in rates bills for those businesses that were located in areas where local authorities had pursued high-spending/high-tax policies. The 'poundage effect' tended to drive changes in rates bills within Inner London (Denny and Ridge, 1992).[8]

The 'revaluation effect' tended to drive changes in rates bills outside of Inner London (Denny and Ridge, 1992). Whilst, on average, rateable values had risen

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[8] This was largely due to the unwinding of various aspects of the local finance system of the 1980s which had artificially reduced rate poundages within the capital.

FIGURE 1

The Impact of the 1990 Revaluation on Rateable Values, by Sector
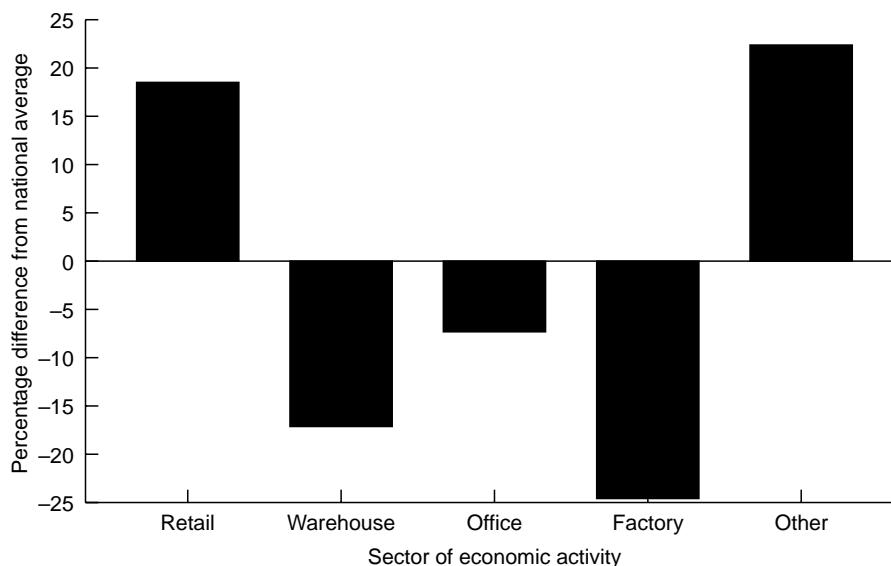
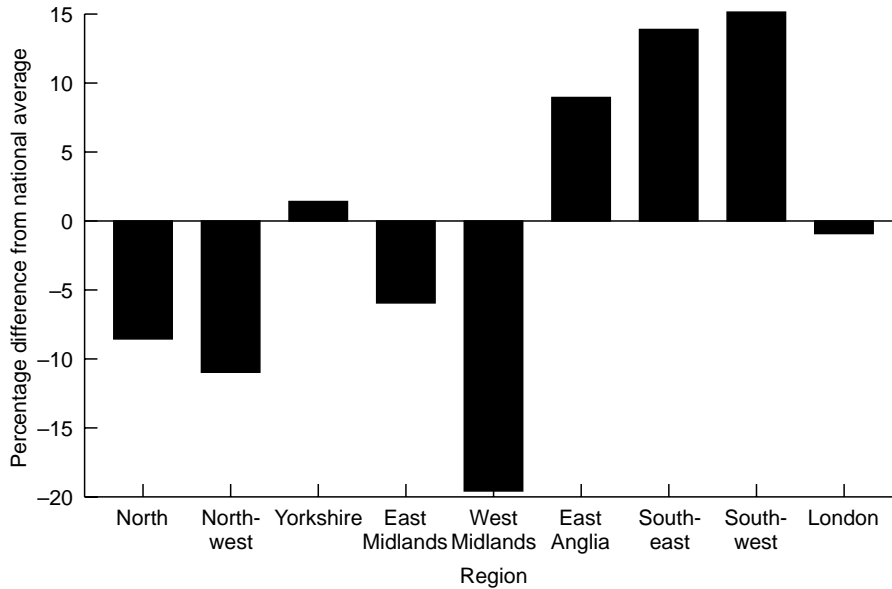Source: Local Government Financial Statistics No. 2, 1990.

by a little more than eightfold as a result of the introduction of the 1990 Valuation List, there was a considerable degree of regional and sectoral variation. The largest increases in rateable values were concentrated in the retail sector, as shown in Figure 1. Figure 2 illustrates the regional pattern of changes to rateable values that occurred as a result of the introduction of the 1990 Valuation List. The largest increases in rateable values occurred in the south-east and the south-west.

An initially self-financing scheme of transitional relief was introduced to limit the annual increases in rates bills (after allowing for inflation) that businesses could actually face as a result of the 1990 reforms. In the first two years of the scheme, transitional relief was paid for by a corresponding set of limits to the reductions in rates bills that businesses could receive as a result of the reforms. These thresholds differed for small and large properties,[9] as shown in Table 2.

The combination of large local tax rate differentials prior to 1990 and the impact of the 1990 reforms rendered the period from 1987 to 1992 one of considerable volatility in the non-domestic rates bills faced by individual property occupiers. This makes it a particularly informative period for assessing

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[9] For the purposes of transitional relief, 'small' was defined as a rateable value of less than £10,000 (£15,000 within Greater London). All other properties were classified 'large'.

FIGURE 2

The Impact of the 1990 Revaluation on Rateable Values, by Region

Source: Local Government Financial Statistics No. 2, 1990.

the impact of changes in the burden of business property taxes on commercial property rents.

IV. DATA

Our study of the impact of non-domestic rates used information on rent and rates bills for a panel of 2,964 institutionally-owned, rented commercial properties in England and Wales for the six-year period from 1987 to 1992.[10] Information on rents and other characteristics for each of the 2,964 individual properties was obtained from Investment Property Databank. This was matched with information obtained from the Inland Revenue Valuation Office Agency on each property's rateable value both before and after the 1990 revaluation.

The sample includes properties from 307 of the 403 local authority areas in England and Wales. This sample is believed to be broadly representative of the types of rented commercial property held within institutional property portfolios. It should be noted that it is certainly not representative of all commercial property within England and Wales. Institutional portfolios tend to contain a

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[10] Interested readers are referred to Bond, Denny, Hall and McCluskey (1994) for more details of our sample and empirical analysis.

TABLE 2

Maximum Annual Changes to Rates Bills under the Transitional Relief Scheme
(real terms)

	1990–91	*1991–92*	*1992–93*
Maximum increase			
Small property	15%	15%	0%
Large property	20%	20%	0%
Maximum decrease			
Small property	15.5%	18%	27%
Large property	10.5%	13%	22%

disproportionate number of higher-value properties and properties within the south- east of England. Within the sample, there were very few properties with a rateable valuation of less than £10,000 (the threshold for a property outside of London to be classed as 'small' for the purposes of transitional relief). Our results based on this sample may not extend to the commercial property market as a whole.

Two measures of property rents were available in the Investment Property Databank data: gross rents passing and estimated rental values. Gross rents record the actual rent received by the landlord during a period. Unfortunately, this measure is generally based on a single month, so if the property happened to be partially or wholly unoccupied during that month, this measure would be misleading. A more serious problem with the gross rents measure for our purpose, though, is that during the sample period, the standard institutional lease typically specified a rent review only every five years, and contained an `upward-only' review clause.[11] This means that during our six-year sample period, we are unlikely to observe more than one genuine change in the gross rents measure,[12] and this could well occur before the April 1990 rates reforms. This greatly reduces the information content of the gross rents data for assessing the impact of business rates changes.

The estimated rental value (ERV) is a valuer's estimate of what the property could be let for to a new tenant on a standard institutional lease on the open market at a specified date, generally in December of the year. All relevant factors such as property type, size, location, condition and use restrictions would be taken into account in determining the ERV. Crucially for our purpose, ERVs are revised annually. Thus although they are not a genuine market measure of

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[11] 'Upward-only' review clauses are now less common than they were during our sample period.

[12] Though spurious changes could be induced by variations in occupancy rates.

rents paid, ERVs were much more informative within our sample period about the direction, size and speed of adjustments to property rents. In addition, ERVs are based on the assumption of 100 per cent occupancy rates, so they do not contain spurious movements related to periods of incomplete occupancy. Indeed, it is for these reasons that estimated rental values are widely used by property market analysts. Most of our empirical analysis was therefore based on the estimated rental value data, although we checked that movements in ERVs predicted movements in gross rents, and that similar patterns were found in the gross rents data.

One feature of the ERV measure is that it is based on the assumption that properties are let to new tenants. Since new tenants did not qualify for transitional relief before April 1992, this implies that within our sample period, movements in estimated rental values should be related to a measure of non-domestic rates *before* allowing for the effects of transitional relief. We confirmed that this measure was indeed more informative about movements in ERVs than a measure of business rates after allowing for the effects of the transitional relief schemes.

V. EMPIRICAL FINDINGS

In assessing the impact that changes in non-domestic rates bills may have on commercial property rents, it is important to control for any other factors that might influence property rents. These include property quality, location, local amenities, including the value of services provided by local authorities, and local and national economic conditions.

Ignoring the effect that property 'quality' has on the rent that a landlord can charge is likely to severely bias the results of a study of the relationship between rates and rents. Factors such as a prime location and high-quality accommodation are likely to result in both high rateable values and premium commercial rents. This will induce a spurious positive association between rates and rents if the effect of property quality is not controlled for adequately.

Unfortunately, we had very little information on the attributes of the properties within our sample. However, it is very likely that these attributes, such as proximity to desirable amenities, do not vary very much over short periods of time. As a result, since we have repeated observations on the same properties over a six-year period, we can control for the effects of these unobserved characteristics by considering the relationship between changes in rates bills and changes in property rents, rather than the relationship between rates and rents levels. Indeed, we confirmed that the correlation between the levels of rates and rents gave a seriously misleading impression of the impact of rates on property rents.

To control for aggregate influences on rents such as national economic conditions, we included in our analysis a full set of variables to capture

influential factors operating in specific years ('year effects'). It would be unwise, however, to treat the property market in Britain as homogeneous, since economic and property market conditions often vary considerably between localities. In the absence of detailed information on conditions in local property markets at each point in time, we proxied local property market conditions by including information on local labour market conditions. Unemployment rates and vacancy

rates give an indication of the amount of slack in each local labour market, whilst the rate of long-term unemployment may indicate more structural influences on local labour market conditions. These controls for local economic conditions should ensure that our results are not distorted by purely regional differences in the impact of the 1990 reforms and subsequent property market trends. As a further check against this, we report separate models for properties in different regions within our sample.

We also allow for the possibility that the adjustment of property rents to changes in non-domestic rates is not completed within the same year. We discussed in Section II why the long-run impact may be different from the short-run impact. The presence of institutional rigidities such as five-yearly rent reviews is a further reason why the adjustment of rental values may be sluggish: the demand for rented properties is likely to be influenced by the prevailing rents on similar properties.[13] We find that estimated rental values take several years to adjust fully to changes in non-domestic rates. It should be borne in mind that this analysis *underestimates* the time taken for actual rents paid by tenants to adjust, since changes to actual rents paid are limited by these institutional rigidities.

Our approach therefore relates current changes in rents to current and lagged changes in business rates and to lagged changes in rents, with additional controls for year effects and for local economic conditions. The estimation of dynamic regression models using short panels raises estimation issues which we solve by using instrumental variable procedures. Our estimation methods are described in detail in Bond, Denny, Hall and McCluskey (1994) and in Arellano and Bond (1991).

This approach produced satisfactory results for the 1,726 retail properties in our sample. We obtained similar but less precise results for the small subsample of 334 industrial properties contained in our full sample. It should be noted that we were not able to obtain a satisfactory statistical model for the subsample of 904 office properties. This may be because the adjustment of rents to changes in rates takes a more complex form in the office sector than we were able to allow for using our short period of data. For these reasons, we focus here on our findings for the retail sector. Again, it should be stressed that these results may not extend to other sectors of the commercial property market.

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[13] The impact of fixed nominal contracts on the speed of price adjustment has been extensively analysed in the literature on wage contracts. See, for example, Taylor (1979).

Regression results for samples of retail properties located in London, the south- east (excluding London) and the rest of England and Wales[14] are reported in the Appendix. The main finding of interest is that there are large and statistically significant effects of rates increases on estimated rental values. These results are summarised in Table 3, which reports the simulated effects of a £1 increase in business rates per square foot on estimated rental value per square foot, after one year, two years, five years and in the very long run, based on the regression models estimated for each of these samples.

These results suggest that the long-run effect of a £1 increase in business rates could be to reduce property rents by as much as £1. In London and the south-east, the point estimate of this effect is actually greater than £1, but not significantly so. Indeed, it should be noted that our estimates of these long-run effects are very imprecise. Whilst we cannot reject the hypothesis that rents fall pound for pound with rates in the long run, leaving total occupancy costs constant and shifting all the burden of business rates on to landlords, nor can we reject the hypothesis that rents fall by only 80p; and indeed, outside London, we cannot reject the hypothesis that the long-run fall in rates is only 50p. This uncertainty about the long-run effects of rates increases is not surprising, given that we have only six years of data in total, and only two years and eight months of data after the reform to non-domestic rates in April 1990. The main result of interest is the rejection of the hypothesis that none of the burden of business rates is shifted on to property owners, and the suggestion that a substantial part of any increase in business rates may be reflected in lower property rents in the long run.

Our estimates of the impact of higher business rates after one and two years are likely to be more reliable, given the period of our data and also the structure of our econometric model. After two years, we can again confidently reject the hypothesis that business rates have no impact on property rents. The estimated effects of a £1 increase in rates per square foot are to reduce estimated rental values after two years by 45 pence per square foot outside London and the south-east, by 67 pence per square foot in the south-east outside London, and by 86 pence per square foot within London.[15] There is a significant tendency for property rents to adjust faster in London than elsewhere.

To confirm that these results based on estimated rental values were likely to be eventually reflected in the actual rents paid by tenants, we conducted two

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[14] Further disaggregation of the rest of England and Wales into north and Midlands subsamples, and into metropolitan and non-metropolitan subsamples, did not suggest significant differences between these cases. Nor did disaggregation by property-size classes, although it should be emphasised that our sample of institutionally-owned properties contains very few genuinely small properties.

[15] These results are not inconsistent with those recently reported by McDonald (1993), who found that the effective incidence of a property tax was fairly evenly divided between landlords and tenants using a sample of 259 properties in Chicago. Sibley (1989) also found that property tax differentials across the Camden–Westminster border led to lower rents in the higher-tax jurisdiction.

TABLE 3

Summary of Results for the Retail Sector

Region	Number of properties	Effect on ERV per square foot of a £1 rise in rates per square foot after:			
		One year	Two years	Five years	Long run
London	257	−0.27 (0.15, −0.69)	−0.86 (−0.34, −1.37)	−1.47 (−0.71, −2.22)	−1.59 (−0.74, −2.44)
South-east	547	0.15 (0.6, −0.27)	−0.67 (0.02, −1.31)	−1.55 (−0.04, −3.06)	−1.76 (0.19, −3.70)
Elsewhere	922	−0.15 (−0.02, −0.27)	−0.45 (−0.22, −0.69)	−0.74 (−0.33, −1.14)	−0.78 (−0.33, −1.23)

Note: Ninety-five per cent confidence intervals based on asymptotic standard errors are reported in parentheses.

analyses using the gross rents data in our sample. First, we investigated whether observed increases in gross rents were predicted by past increases in estimated rental values. A logit regression analysis confirmed that the probability of observing an increase in gross rents was significantly higher for properties where there had been an increase in estimated rental value since the previous change in gross rents than for properties where there had been a decrease in estimated rental value. At sample means, a 17.5 per cent increase in estimated rental value increased the probability of observing an increase in gross rents from 31.4 per cent to 34.5 per cent. Second, we investigated directly whether the observed increases in gross rents were predicted by past changes in business rates. A logit regression analysis confirmed that the probability of observing an increase in gross rents was significantly lower for properties where there had been an increase in non-domestic rates. Again at sample means, a 40 per cent increase in non-domestic rates reduced the probability of observing an increase in gross rents from 31.4 per cent to 30.3 per cent. Whilst these results are by no means conclusive, they do suggest that the patterns we find in the estimated rental value data are likely to be reflected eventually in the actual rents paid by tenants.

VI. CONCLUSIONS

Our main finding is that increases in non-domestic rates put downward pressure on commercial property rents. The direction of this effect is consistent with a standard theoretical analysis of the impact of property taxes on property rents. The size of this effect is difficult to estimate precisely based on our short sample

of data.[16] We cannot reject the hypothesis that rents fall pound for pound with business rates in the long run, but the long-run adjustment could also be lower than this. After two years, we find estimated rental values falling by between 45p and 85p per square foot in response to a £1 increase in non-domestic rates per square foot.

We also find that this adjustment of estimated rental values to changes in business rates takes several years to be completed. Since the adjustment of actual rents paid by tenants is further limited by contractual rigidities such as five-yearly rent reviews and upward-only review clauses, this emphasises that the total cost of occupying business property for tenants will be higher for several years after an increase in business rates. Whilst a substantial part of the effective incidence of an increase in non-domestic rates is shifted on to property owners in the long run, in the short term most of the effective incidence remains with the firms occupying business property.

These findings have two principal implications for policy. First, occupiers of business property are likely to be the main beneficiaries of temporary provisions such as the transitional relief schemes that have operated in the UK since 1990. Transitional relief thus appears to meet the objective of cushioning businesses in the short run from the effects of large rates increases. Second, however, the main beneficiaries in the long run of any permanent reduction in the level of non-domestic rates may well be property owners rather than property occupiers. Lower business rates may thus be of limited benefit to businesses in the long run.

APPENDIX:
REGRESSION RESULTS FOR SAMPLES OF RETAIL PROPERTIES

Our regression model relates the estimated rental value per square foot for property i in year t ($ERV_{i,t}$) to the estimated rental value per square foot for that property in the previous year ($ERV_{i,t-1}$), to the rates bill per square foot for that property in year t ($RATES_{i,t}$) and to the rates bill per square foot for that property in the previous year ($RATES_{i,t-1}$). Additional variables included in each model are year dummies, county vacancy rates, district unemployment rates and the proportion of long-term unemployment in the district.

Estimation is by instrumental variables after taking first differences to control for unobserved property-quality attributes. The instruments used are lagged values of the property-specific variables dated t–2 and earlier, and current values of the local economic variables. These instruments are valid provided the regression disturbances are serially uncorrelated before transforming to first differences. If this is the case, we should find significant negative first-order

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[16] We note that it should be possible to reduce this uncertainty in future work by extending the sample period to cover the 1995 revaluation.

TABLE A.1

Regression Results

Dependent variable: estimated rental values = ERV$_{i,t}$

	Retail, London	Retail, south-east	Retail, elsewhere
ERV$_{i,t-1}$	0.56 (0.05)	0.57 (0.13)	0.52 (0.04)
RATES$_{i,t}$	−0.27 (0.22)	0.15 (0.21)	−0.15 (0.06)
RATES$_{i,t-1}$	−0.44 (0.18)	−0.90 (0.39)	−0.23 (0.08)
m1	−4.59	−3.70	−6.77
m2	−1.28	−0.26	−1.13
Sargan	23.28	28.07	34.81
Number of properties	257	547	922

Notes:
Asymptotic heteroskedasticity-consistent standard errors are reported in parentheses.
m1 and m2 are tests for first-order and second-order serial correlation in the differenced residuals, asymptotically distributed as N(0,1) under the null of no autocorrelation.
Sargan is a test of over-identifying restrictions, asymptotically distributed as $\chi^2(17)$ under the null of instrument validity.

autocorrelation in the first-differenced residuals, and no second-order autocorrelation, which is the case here.

Regression results for each of the samples discussed in the text are reported in Table A.1.

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