

CHAPTER 31

**THE GEOGRAPHICAL IMPLICATIONS OF CHANGING LOCAL TAXATION
REGIMES**

(P Longley, D Martin and G Higgs)

Transactions, Institute of British Geographers, 1993, NS 18(1), 86-101

The geographical implications of changing local taxation regimes

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Revised MS received 11 September, 1992

ABSTRACT

Britain is currently experiencing a rapid succession of different local taxation regimes, namely the domestic rates, the community charge (adjusted by various amounts of transitional relief) and the council tax. Although each of these regimes is in practice a hybrid tax based upon dwelling attributes and household characteristics, the principal mechanisms of taxation have changed significantly over the last four years. Little is known about the recent and future redistributive consequences of these changes in a geographical context. In this paper, we develop and extend our previous research on the impact of the changeover from the domestic rates to the community charge at the small area level: specifically, we extend our analysis to anticipate the impact of the council tax, and we model its redistributive consequences using a street-level GIS. Our empirical study is based upon the estimated 45 658 dwellings that comprise the Inner Area of Cardiff, Wales. The pattern of revenue-raising under the domestic rates is described using a public domain source, and the pattern of revenue-raising under the community charge is approximated using the Electoral Register. The pattern of payment under the council tax is modelled in a GIS environment using information collected in a house price survey. Redistributive patterns under the three basic regimes are described and some implications of the council tax are assessed in a geographical context.

KEY WORDS: Domestic rates, Community charge, Council tax, Geographical information system

INTRODUCTION

During the last twenty years there has been sustained interest in intra-urban patterns of revenue raising and expenditure, and analysis of their redistributive consequences (e.g. Bennett, 1980; Harvey, 1973; Short, 1984). In Britain, the value of such research is increasingly apparent given the rapid succession of a number of alternative means of local revenue raising. Although the effects of some of these regimes are now broadly understood (Midwinter, 1989; McCrone, 1991; Paddison, 1989), there has been little empirical analysis of the changing geographical patterns of revenue generation. In this paper, we

describe the development of a street-level georeferenced database to investigate the changing intra-urban geography of revenue-raising in Cardiff, Wales. This work develops from a previous study of the introduction of the community charge, and its impact at the small area level, described in Martin *et al.* (1992). The key developments of this work which are presented here are: (a) the extension of our analysis to examine the new council tax using a geographical model; and (b) the substantial enhancement of our database to permit street-by-street analysis. The council tax component has involved the construction of a property valuation model using survey

information and secondary sources, and has already attracted considerable attention as the first comprehensive attempt to model council tax valuations over a wide area (Independent, 1992). Specifically, we will: (i) examine whether there has been, and will continue to be, a distinctly geographical dimension to local revenue raising; (ii) assess whether distinct geographical patterns of gain and loss characterize the transition period between three different regimes; and (iii) begin to investigate the extent to which any such patterns bear a correspondence to the geography of the built form of the City.

The remainder of this paper is structured as follows. In the next section we review the recent history of local revenue raising and anticipate prospects for the 1993–4 tax year. In the following section we describe the creation of a geographical information system in order to monitor the changing intra-urban geography of three different tax regimes (the domestic rates, the community charge and the council tax) in the Inner Area of Cardiff. Next we present numerical and map-based analyses of these three different tax regimes. Finally, we draw a number of substantive and methodological conclusions, and identify some of the wider implications of this research.

THE RECENT HISTORY OF LOCAL REVENUE RAISING

Prior to 1990 the established means of local taxation was through the domestic property rates, which were based upon a multiple of the annual 'rateable value' (realizable private sector annual rent) of each domestic dwelling within a rent-clearing market. Over time such rateable values became increasingly notional, as other tenure forms came to dominate the housing market and rents within the increasingly residualized private sector became constrained and regulated. Given that revaluations were carried out infrequently, rateable values often came to exhibit an identifiable correspondence with the age of dwellings, and precedent led to certain types of dwellings (e.g. purpose built flats) receiving higher pro rata rateable values than dwellings of similar size yet of more traditional construction. By the time of a general revaluation of all domestic properties in Scotland in the late 1980s, there was a widespread feeling (particularly within central government) that the system was in need of replacement rather than overhaul, although it is reasonable to conjecture that this was as much a manifestation of a more deep-

seated ideological dissatisfaction with the entire system of local government finance, as unease with the rates system *per se* (see McCrone, 1991, for a discussion of the main issues).

The chosen solution was the community charge or 'poll tax', the underlying principle of which was that each eligible adult should pay a fixed charge towards local government services. Students were to pay 20 per cent of the standard charge and a system of means tested rebates (similar to those that operated under the domestic rates system) was to apply. The level of the charge was allowed to vary between local authorities in response to their differing expenditure patterns. In addition, some fairly modest central government funding was set aside to cushion those individuals and households who were the highest losers in the first year (1990–91) of the new regime. Widespread discontent, in city and suburb alike, followed its introduction and greater sums of central government 'transitional relief' were set aside as a palliative measure during the second year of the Charge. This was to be targeted towards those households (archetypically large households living at high residential densities in property attracting low historic rateable values) which were at greatest financial disadvantage following the change. In England this relief was administered on a household by household basis. However, in Wales the 'community' was deemed the most appropriate unit for allocation of this relief: such communities are administrative units which typically comprise one or more local authority wards and were inaugurated following the 1982 Local Government Act. Different amounts of community charge transitional relief were allocated to selected communities and all individual charge payers within each eligible community were to receive the same amount of relief irrespective of amount of previous domestic rates bill. This transitional relief was not, however, to be the only change to the community charge during 1991–92. Early in 1991 a political sea change within the governing Conservative Party led to the planned abandonment of the Charge with effect from the 1993 tax year, and plans were made to defuse its continued unpopularity by effecting a shift from local to central government taxation. An increase in central government Value Added Tax from 15 per cent to 17.5 per cent made possible a reduction of £140 to every full personal charge. Individuals who were already to receive transitional relief also received the full flat rate £140 reduction. In Wales in 1991, therefore, varying levels of transitional relief were first

TABLE I. *Welsh property values, valuation bands and ratios to base tax*

Valuation Band	From	To	Ratio to base tax
A	up to	£30 000	6/9
B	£30 000	£39 000	7/9
C	£39 000	£51 000	8/9
D	£51 000	£66 000	9/9
E	£66 000	£90 000	11/9
F	£90 000	£120 000	13/9
G	£120 000	£240 000	15/9
H	£240 000	and above	18/9

allocated to different eligible communities, scaled relative to the full personal charge and only then was a further £140 reduction then sliced off the bill, irrespective of area of residence: interpretation of our analyses of the 1992 charge is guided by the assumption that the 1992/3 charges were derived in a similar manner.

The replacement to the community charge is to be the 'council tax' with effect from 1st April 1993. Central to this tax is a valuation of the capital value of each domestic property and in this respect it marks a return to local taxation based upon dwelling attributes. In practice, however, the council tax will be a hybrid, since 25 per cent discounts will accrue to dwellings in which only one person aged 18 or more lives, or where all but one of the adult residents are 'designated' not to count: 50 per cent discounts will apply to property where all the residents are designated not to count and (in most cases) are to apply to empty property. The process of assigning capital values typically requires a surveyor to identify a representative 'beacon' property within a street and to value it on the basis of an external inspection, invoking a number of assumptions as to its physical state of repair and availability for sale. The capital valuation is used to assign this and each of the neighbouring properties to one of eight valuation bands. The bands for Wales are shown in Table I, together with the ratios that link the magnitude of payments between the bands. The Department of the Environment estimate that the average council tax paid for Band D properties in England for 1991-2 would have been £400, although in practice the amount of tax payable would have depended upon the local council's budget and the level of central government support for local government expenditure. As has been the practice under both the domestic rates and the community charge, average

household bills will be rather lower in Wales than in England.

Local government finance is therefore in a state of flux, with the only consistent trend over the last four years being a downgrading of the proportion of local government expenditure that is raised locally for example, in the current tax year (1992-93) it is estimated that just 12 per cent of Cardiff City Council's expenditure will be raised locally. This has had far-reaching implications in terms of the vulnerability of local governments to central government expenditure 'capping' and these fiscal issues are now under investigation (Hills and Sutherland, 1991). The causes and consequences of these lurches in the local revenue raising aspects of public policy together with their broad socioeconomic and demographic consequences, have also attracted widespread commentary, but with few exceptions (e.g. Burnett, 1990), little is known about the detailed geography of winners and losers within localities. We might intuitively expect that the revenue raising pattern generated by historical rateable values would be very different from the socioeconomic revenue-raising surface of the community charge, which in turn would be very different from that produced by a geography of present day capital values. Given that each individual and household is likely to have paid rather different proportions of the local revenue bill during each of the last four years, the changing patterns of winners and losers will become important if, as seems likely, unitary and other local authorities resume significant revenue-raising responsibilities and local revenue raising again returns to the top of the political agenda. One might conjecture that the radical rejigging of revenue-raising geographies that has occurred over the last four years has created a potentially volatile situation in city and suburb alike, particularly if local revenue raising were to be restored to historical real levels. In the next section, we will begin to investigate these changes through an empirical analysis of different local tax burdens under the domestic rates, the community charge and the council tax in Cardiff.

DEVISING A COMMON FRAMEWORK FOR MONITORING CHANGE

Cardiff developed rapidly as a coal exporting port from the 1860s onwards although development of the industrial core of the city slowed markedly in the immediate aftermath of World War I (Daunton, 1977). Growth during this fifty year period was very

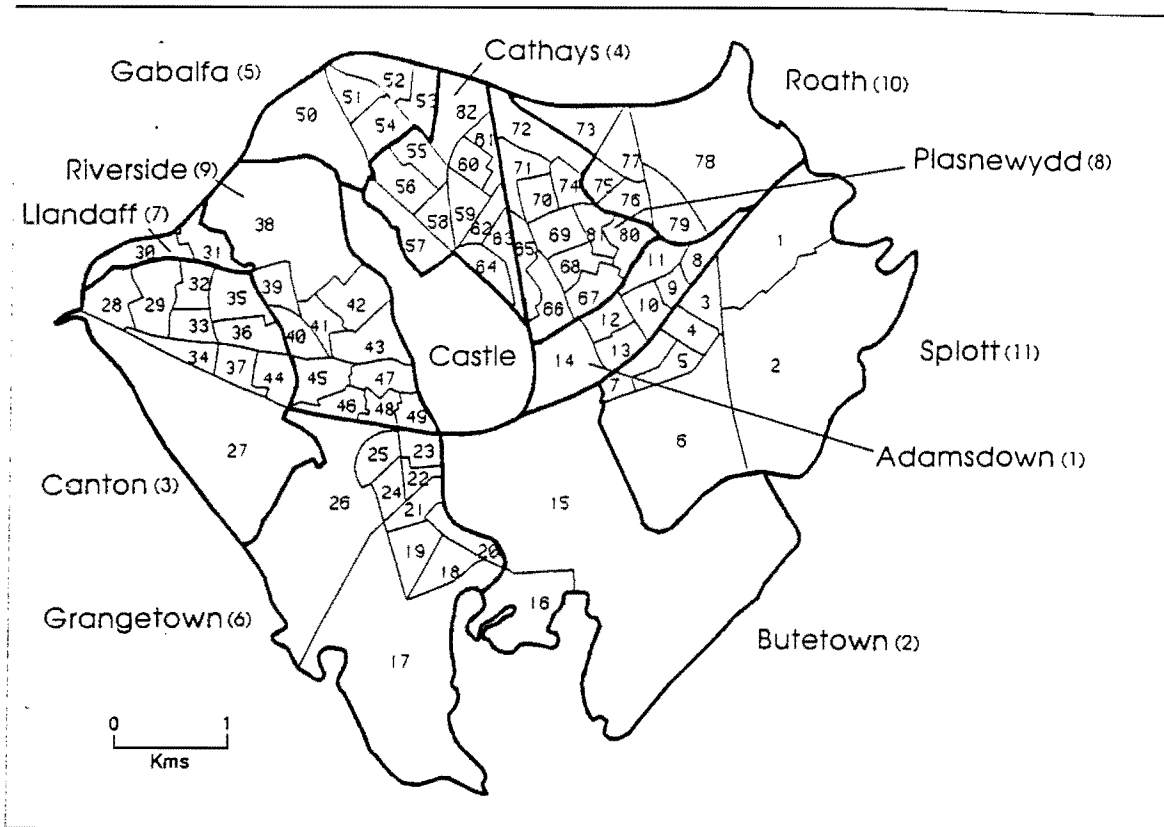


FIGURE 1. Breakdown of Cardiff's Inner Area into wards and HCS areas

rapid, however, and as a result the inner city today still exhibits considerable homogeneity of built form. More recently this homogeneity has been disrupted to some degree by the incursion of local authority estates on the edge of the inner city (Gabalfa and Tremorfa); the comprehensive redevelopment by the Council of part of Butetown during the 1960s; and scattered pockets of infill redevelopment throughout the Area. Cardiff City Council has vigorously pursued a range of urban renewal initiatives over the last twenty or so years, and it is for the implementation of such policies that the City Council has defined the 'Inner Area' to approximate the predominantly Victorian and Edwardian core to the City. In order to facilitate detailed implementation of housing policy, this Inner Area has, in turn, been broken down into 81 'House Condition Survey' (HCS) areas, on the basis of observable within-area homogeneity of built form. The mean size of each HCS area is approximately 450 dwellings, and we will make use of this property of within-area homogeneity when we come to model council tax capital values. The wards and part wards which comprise the Inner Area will form the focus of our empirical study, and are shown in Figure 1 together with the boundaries of the 81 HCS areas.

Each of the three basic local tax regimes has, or will be, implemented using a purpose built register. The domestic property rating system was administered using the Rates Register, in which each separately rated hereditament was identified by a unique property code, a brief description of the property, an address and a rateable value. Valuation information was, and continues to be, updated in the light of revaluations and appeals, although in general no properties constructed after 1990 have been included in the lists. This information is in the public domain. The legislation enacting the community charge required each eligible adult to register on an address-based list. This list also enables identification of charge-payers who are entitled to make a reduced contribution. In practice this register has not been publicly available, although in Wales it is possible to obtain aggregate figures of the number of charge-payers registered in each community area. The council tax Register is to be based on estimates of property values as at April 1st 1991 (Pilgrim, 1992), a time at which real property prices throughout the UK were falling quite sharply in the aftermath of the 1987 housing boom. At the time of writing, it is expected that provisional estimates of banded capital values

will be announced in December 1992, but it is unclear what detail of information will be made available (e.g. whether the 'beacon property' used for street valuation will be identified) and what the precise nature of the appeals procedure will be. Any attempt to anticipate the redistributive effects of the introduction of the Tax will therefore require creation of an independent data base.

The creation of a database for comparing the detailed geographies of the three basic tax regimes is therefore far from straightforward. For purposes of the present research, we have sought to create detailed estimates of changing individual and household liabilities at the street scale of analysis, and for this purpose we have created a digitized street network for the entire Inner Area. We have described in a previous paper (Martin *et al.*, 1992) the means by which we have merged information from the Rates Register with surrogate estimates of the distribution of community charge payers within the Inner Area.¹ This merged data base has been matched with our digitized street network in order to facilitate the present analysis. The creation of a comparable data base for the council tax is a far more involved task, since no comprehensive register of dwelling capital values yet exists. As a first step, in December 1991 a survey of asking prices of properties for sale within the Inner Area was carried out using estate agents' information. 796 asking prices were obtained, together with brief information as to property type, numbers of bedrooms, estate agent through which property was for sale², and whether or not the asking price had been reduced since the property had first been put on the market. This represents an estimated 2.1 per cent of the total dwelling stock in the Inner Area. Unique addresses were identified for 269 dwellings of which 232 (0.62 per cent of the total stock) could be matched with the rates register: all others could be traced to named streets. This variable level of address referencing reflects the amount of detail available from the publicity material that was readily available from the different estate agents. Exploratory analysis was undertaken in order to ensure that asking prices were obtained for approximately equal proportions of the dwelling stock of each Inner Area community (Table II)³.

The method adopted for the estimation of capital values to every dwelling in the Inner Area is illustrated in Figure 2. Before beginning the assignment process, the small number of properties identified in the rates register as separately rated rooms or bed-sits were aggregated into single properties, as defined by

TABLE II. Counts and proportions of all dwellings surveyed, by community (or part community within Inner Area)

Community	Number of Properties	% of Total Dwelling Stock
Adamsdown	43	2.35
Butetown	27	8.11
Canton	120	2.52
Cathays	106	3.15
Gabalfa	45	2.83
Grangetown	93	2.59
Llandaff	3	0.75
Plasnewydd	120	2.94
Riverside	111	3.30
Roath	82	3.93
Splott	46	1.72
Total	796	2.10

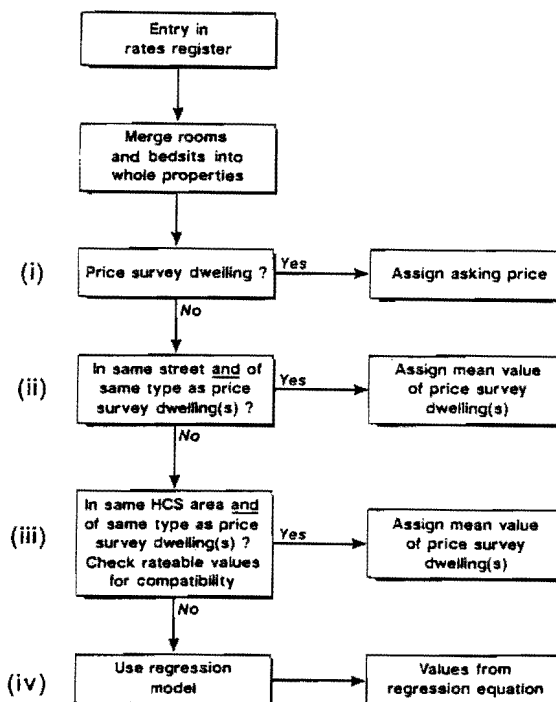


FIGURE 2. Estimation of capital values for every dwelling in the Inner Area

the rates register. Valuations were assigned to each property in the rates register by attempting to match them with one or more properties identifiable from the price survey ('price survey dwellings') or, where this was not possible, by imputing an appropriate capital value using a statistical model.

TABLE III. Breakdown of methods used to allocate properties to bands

Class	No. Properties
i (exact)	269
ii (street)	20 982
iii (HCS area)	22 523
iv (regression)	1884
non-residential	1356
Total	47 014

For the 232 properties whose full address was known from the price survey, the asking price was assigned directly (stage 'i' in the figure). If there was no direct match, the search was extended to any properties of the same type ('house', 'flat', etc.) which were located in the same street (stage 'ii'). If price survey information was available for more than one dwelling in the street, the mean value was assigned to the rates register entry. If no suitable surveyed properties were located in the same street, properties of the same type were sought in the same (physically homogeneous) HCS area. Such properties were only included where the rateable value of the price survey dwelling fell within one standard deviation of that of the property to be valued. Where no rateable value was known for the price survey dwelling, the value from the survey was used providing that the rateable value of the property to be valued fell within one standard deviation of the mean rateable value for its street (stage 'iii'). Again, the mean value of any matching properties was imputed to the current rates register entry. If it proved impossible to assign a valuation based upon any of these matching methods, a value was imputed using a simple regression model (stage 'iv' in the Figure).⁴

All of these procedures are inevitably inexact and are subject to both measurement and inferential errors. However, we would argue that this methodology is likely in most cases to be no more inaccurate than the official procedure of interpolating values about 'beacon' properties. We have looked in some detail at the values produced for some of the most heterogeneous (and hence difficult to value on a group basis) streets in the Inner Area, and the results from our areal interpolation and regression procedures correspond closely with our expectations based upon long familiarity with this Area. Table III shows the numbers of properties allocated to bands using each of the four procedures, and Table IV

TABLE IV. Allocation of properties between bands for the Inner Area

Valuation Band	From	To	No. of properties
A	up to	£30 000	2092
B	£30 000	£39 000	8226
C	£39 000	£51 000	16 047
D	£51 000	£66 000	8053
E	£66 000	£90 000	5252
F	£90 000	£120 000	1641
G	£120 000	£240 000	2030
H	£240 000	and above	2317
non-residential			1356
Total			47 014

identifies the number of properties allocated to each band. These capital values have then been merged with the street level database to enable comparison of a scenario for council tax payments with the regimes prevailing under the community charge and the domestic rates.

As the final stage, dwelling council tax liabilities have been calculated to generate the same Inner Area revenue that our community charge calculations suggest might be raised in 1992-93. This amounts to an assumption that the total amount of transitional relief allocated to the Inner Area would remain constant (see next section below), but would not be allocated in different proportions to residents of different communities. We feel this is a reasonable assumption given that no details of any transitional relief arrangements for the council tax are yet available, and our calculations provide a valid base from which to scale the redistributive effects after any transitional arrangements have been phased out. Our community charge calculations estimate that the Inner Area could raise £11 017 233 in 1992-93: if this burden were allocated between the 45 658 estimated dwellings in the proportions shown in Table I, the standard (Band D) dwelling charge would have been £234.82 in that same year. The liabilities for the other bands would have been: Band A £156.55; Band B £182.64; Band C £208.73; Band E £287.00; Band F £339.18; Band G £391.37; and Band H £469.64. Using these base estimates, we can anticipate street-level patterns of gain and loss between both the domestic rates and the community charge, and the council tax.

We believe the resulting integrated data base to be the most detailed of its kind that is presently

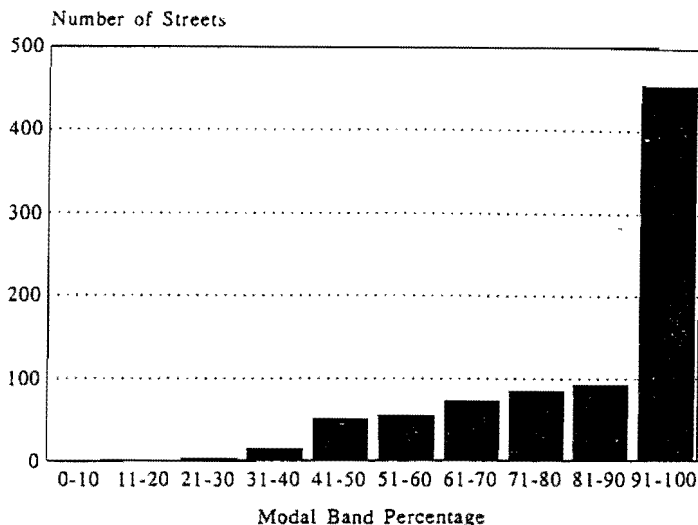


FIGURE 3. Distribution of dwellings about street modal bands in the Inner Area

available, and in particular to provide a good predictor of council tax liabilities at the street scale. We have begun to examine the characteristics of this database in order to assess its sensitivity towards different assumptions regarding measurement and modelling of house values. Exploratory analysis and retrieval of addresses familiar to us leads us to believe that the information that is contained within the database is robust and corresponds with our intuitive expectations about the distribution and heterogeneity of capital values across the Inner Area of Cardiff. For example, Figure 3 shows that the modal street valuation band accounts for over 90 per cent of dwellings in a street for rather more than half of all streets, but that in the remainder of cases the modal band would provide a less appropriate basis to valuation. Table V shows that estimated capital values are quite closely clustered around the modal band, with only 4.2 per cent of all streets having over half of domestic properties with capital values that lie more than one band away from the modal band. Future research will address bench-mark testing and sensitivity analysis of the capital values database. In practice, systems of rebates and discounts have been used to reduce the payments of certain households and individuals: domestic rates were subject to rebates based largely upon ability to pay, the community charge was rebated with transitional relief based upon previous liabilities under the property rates, and in setting the council tax councils must make allowance for lone householder discounts. Councils must also make allowance for reduced student contributions when setting the levels of both the community charge and

TABLE V. Percentage of properties in each street which are classified as being more than one band away from modal band ('Outliers')

% Outliers	No. of streets
0	491
1-10	175
11-20	95
21-30	63
31-40	41
41-50	37
51-60	17
61-70	1
Total	920

the council tax. However, it is not possible to map the incidence of any of these complications at the street level and we have not attempted at this stage to model them using secondary sources. In the case of means tested benefits, this is consistent with our objectives, which do not extend to identifying the geography of welfare subsidy: in the case of reduced student contributions this causes an overestimate of the likely Inner Area yield from the community charge, which is fed through to our calculation of a standard council tax levy.

CHANGING LOCAL TAXATION IN CARDIFF'S INNER AREA

Our data base comprises very detailed street-based information for the Inner Area of Cardiff, but of course cannot be used to estimate the changing

contribution of the Inner Area to the total revenue generated by the City as a whole. In a previous paper (Martin *et al.*, 1992) we have estimated that the Inner Area contributed 35.7 per cent of total City revenues under the domestic rates in 1989–90, that this percentage increased to 39.4 per cent in the first year of the community charge (1990–91), but that the percentage fell back to 29.3 per cent under the community charge in 1991–92 because of the combined impact of areal transitional relief and the blanket reduction in the level of personal charges. It is too early to anticipate the corresponding proportional contribution under the council tax, for the capital values of all dwellings beyond the Inner Area are not known and transitional relief arrangements are not yet in place.

For these reasons, we have disregarded the likelihood of transfers between the Inner and Outer Areas consequent upon changes in the method of taxation, and have thereby effectively assumed that the Inner Area is an appropriate accounting unit for comparisons to be made. We have therefore constrained our comparative analysis of three tax regimes to yield the total estimated revenue of the Inner Area in 1992–93 (£11 017 233) under the community charge. This estimate was obtained by multiplying the total number of electors in each Community by the spatially variable charge, as shown in Table VI. Given a total Inner Area rateable value of £6 871 548, the total revenue could have been raised by applying a poundage of £1.60 to all domestic properties in the Inner Area. The equivalent figure for the council tax is the Band D charge of £234.82 identified in the previous section. These calculations enable us to examine the spatial patterning of revenue raising throughout the Inner Area under the domestic rates, the community charge and the council tax.

The Inner Area illustrated many of the classic characteristics of the rating system in inner cities – low historical rateable values of aging properties which often did not reflect the considerable amount of Council-led improvement activity that has taken place in recent years, and anomalies between the rateable values of newer non-traditional properties and those of the bulk of the dwelling stock. With the exception of some of this more recent development, there was generally a geographical pattern to the property taxes, with the more substantial properties in Roath and Llandaff attracting higher rateable values than more modest properties in Cathays and Adamsdown, with areas such as Grangetown exhibiting intermediate values. This can be seen in Figure 4

TABLE VI. Variable community charges and estimated numbers of charge-payers in the Inner Area, 1992–93

Community	Areal Charge	No. Residents
Adamsdown	89.83	5656
Butetown	150.83	2445
Canton	140.83	10 552
Castle	150.83	306
Cathays	92.83	10 108
Gabalfa	130.83	4785
Grangetown	119.83	9233
Llandaff	150.83	6772
Plasnewydd	119.83	12 133
Riverside	126.13	9468
Roath	150.83	9905
Splott	105.83	7980

in which street mean rateable values have been divided into octiles. In this and our subsequent figures it has been necessary to map information at the street level in order to examine the local complexity which would be obscured by the use of shaded zones. Each octile contains an equal number of named streets, and each of these streets is represented on the maps by one or more line segments. What is apparent is that whilst similar actual rateable values are clustered, there is no over-all homogeneity of rateable values within the administrative community boundaries. Of course, mean values from some very small streets, as well as the averages of long streets that traverse more than one community may present an unrepresentative mean value: it is apparent, however, that most communities are represented in most of the octiles, a finding which begins to cast doubt on the advisedness of using such units to establish areal bench-marks for average domestic rate bills.

The underlying motive for the use of administrative communities to implement community charge transitional relief is that they provide an efficient means of approximating the domestic rates revenue surface using the community charge as the revenue generating mechanism. Examination of Figure 5 suggests mixed success in achieving this objective. The distribution of average household payments is broadly similar: Adamsdown and Cathays remain skewed towards the lower end of the distribution, while Gabalfa and Roath are skewed towards the higher octiles and Grangetown and Riverside maintain an even spread. However, in other communities the distribution of mean street payments is changed under the community charge: in both Canton and

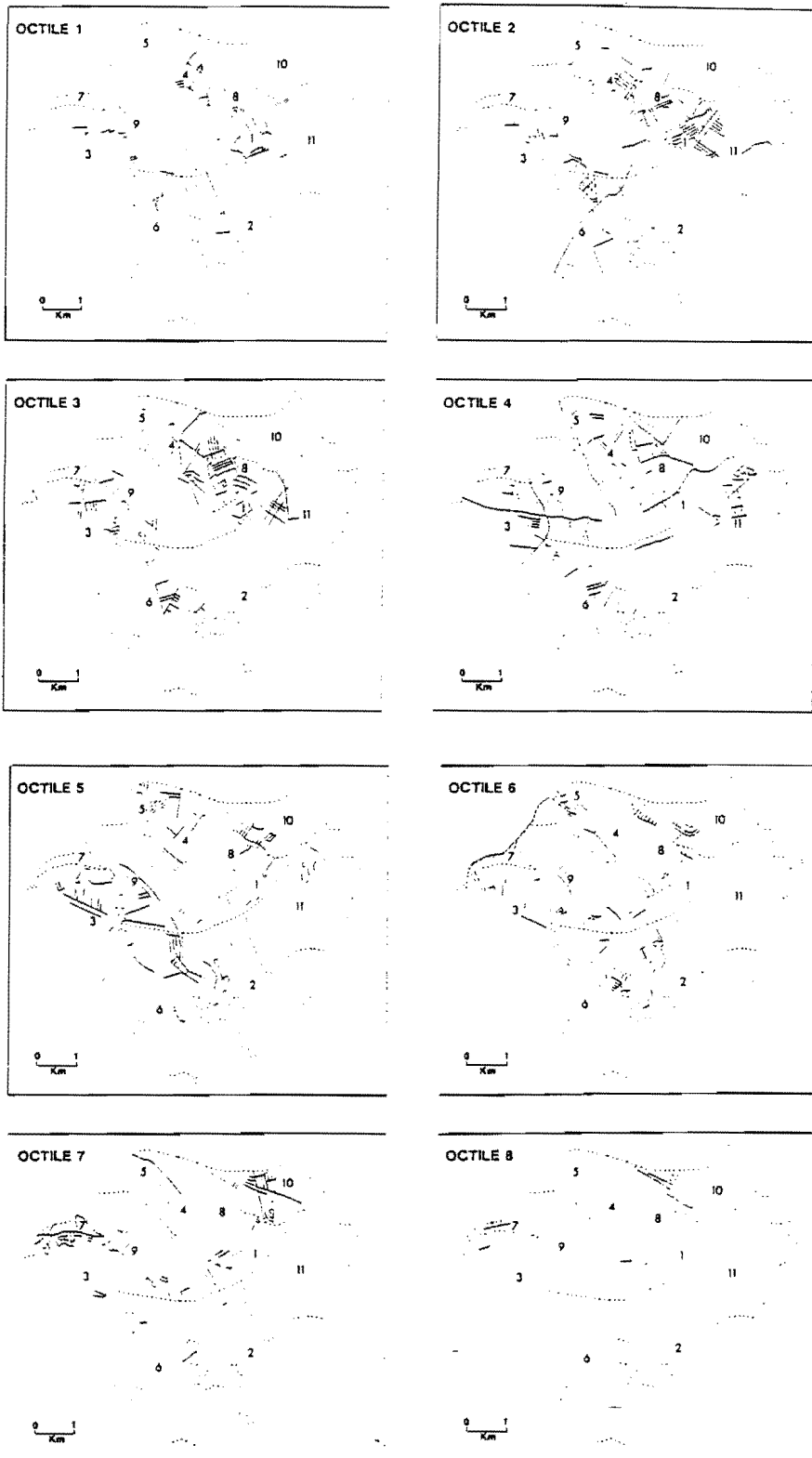


FIGURE 4. Allocation of mean street domestic rates between octiles

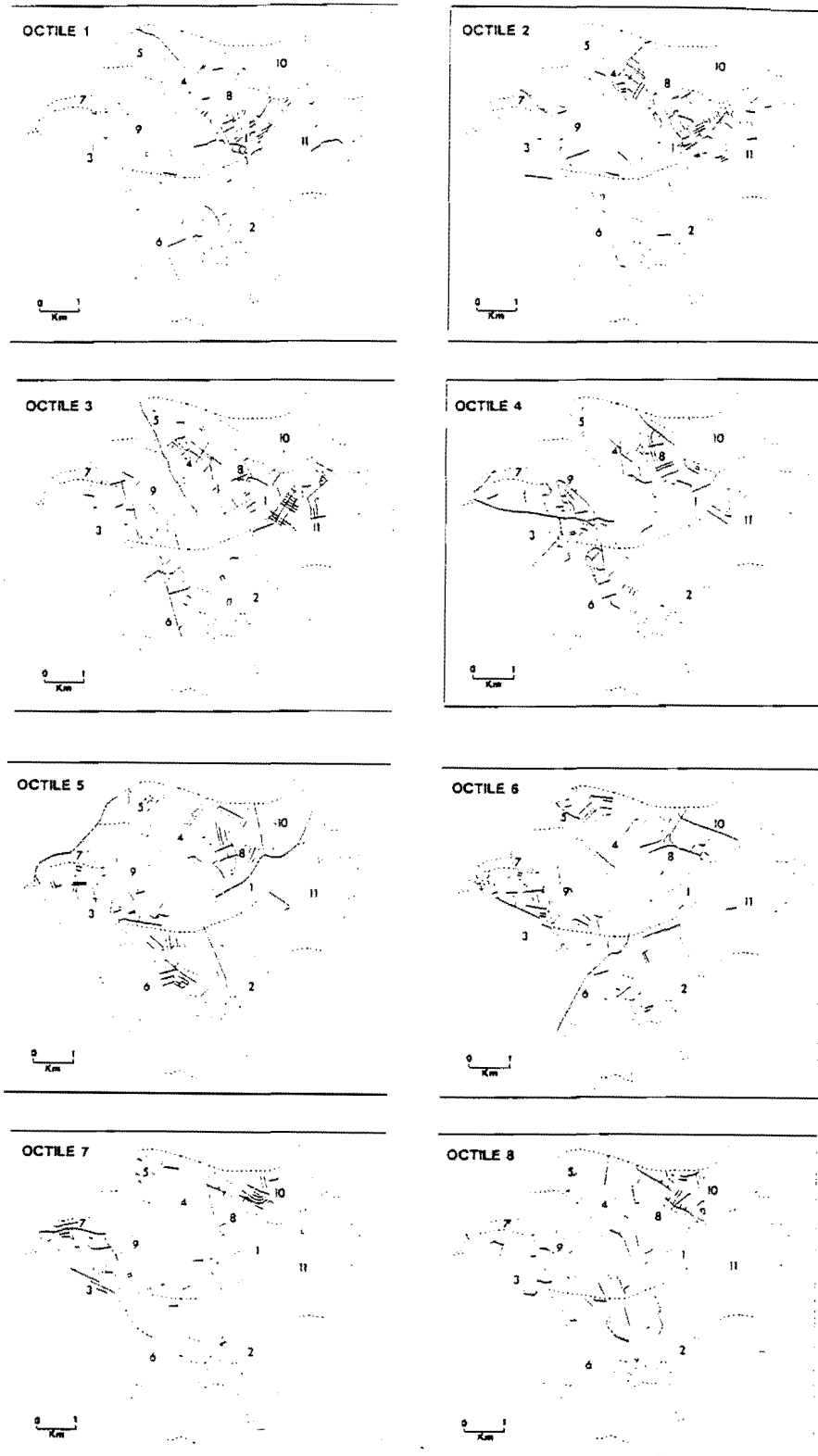


FIGURE 5. Allocation of mean street household community charge between octiles

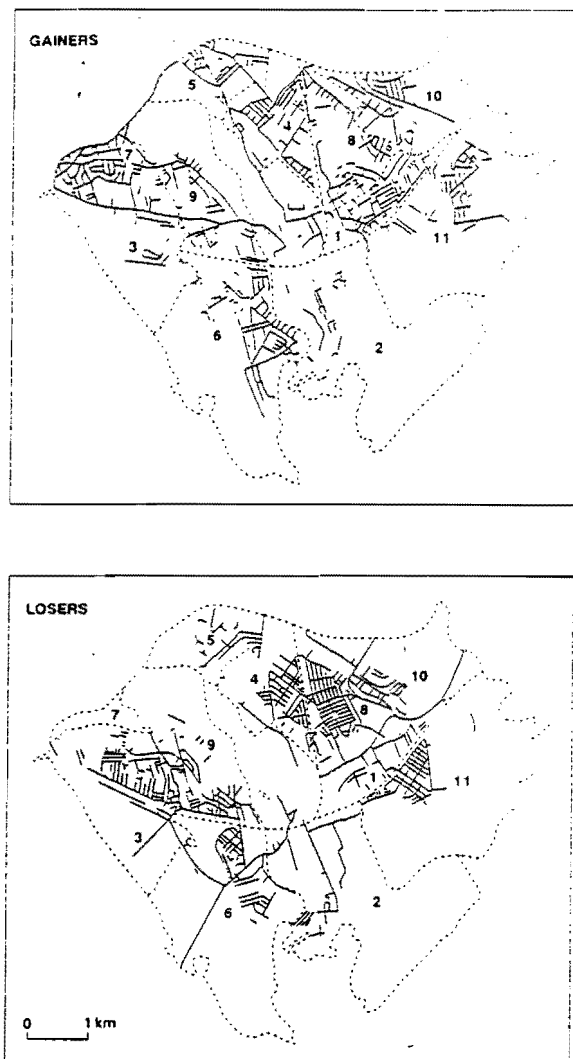


FIGURE 6. Redistributive consequences of the change from the domestic rates to the community charge (with transitional relief)

Butetown a pattern concentrated in the 5th and 6th octiles is replaced by a more even distribution under the community charge, whilst the skews towards the highest octiles in Llandaff and the lower octiles in Plasnewydd and Splott are all attenuated. As a general trend, there is some evidence to suggest that the community charge regime, as modified by transitional relief, has led to some evening out of the Inner Area tax burden, with some redistribution from the residents of the lower rated dwellings towards residents of more substantial hereditaments.

The systematic nature of this redistribution becomes clearer if we consider the patterning of streets which are calculated to have made a gain or a

loss, all other things being equal, following the change to the community charge. Figure 6 shows this mapped pattern of gain and loss, and provides evidence of, first, a systematic inter-community redistribution following the introduction of the community charge: for example, all streets in Inner Area Llandaff (an area comprising large dwellings occupied at low residential density) are gainers from the change, as (less obviously) are most streets in Adamsdown which receives a large and, following the blanket £140 reduction, possibly disproportionate amount of transitional relief from the full charge. Second, there is evidence of systematic redistribution *within* communities following the introduction of the community charge, e.g. about a general north west to south east axis through Riverside which separates larger from smaller hereditaments: similar trends can be discerned in Canton, Cathays, Plasnewydd, Roath and Splott. Finally, at a finer scale, adjacent streets are likely to share the same outcome as each other and, despite between-community variation in the amount of the community charge, this tendency is generally not disrupted by the community boundaries. This effect is most pronounced along the boundaries between Plasnewydd and Cathays, and between Canton and Riverside, but is not evident where wide variations between levels of personal charges exist, as between Adamsdown and Butetown where the personal charge is 68 per cent higher. Over-all, therefore, the revenue raising surface under the community charge amounts to an adult population density map, which is fractured along the community boundaries because of the areal transitional relief arrangements. This relief has led to systematic areal redistribution within communities. Generally speaking, however, this areal relief has not been sufficiently variable to obscure the revenue raising surface of the domestic rates, since there remains contiguity of outcomes (i.e. gain or loss) across the community boundaries which correspond to the geography of built form. The current geography of revenue raising is a blurred approximation to that of the rates, but the geography of built form is not wholly obscured by any means.

The council tax 'octiles' shown in Figure 7 are in fact street allocations to median council tax bands, and as such are not directly comparable with Figures 4 and 5 since there is no constraint that equal numbers of streets should be allocated to each category. Figure 7 nevertheless exhibits similar contiguity effects, and we have examined this figure in conjunction with separate maps of the spatial distribution of streets

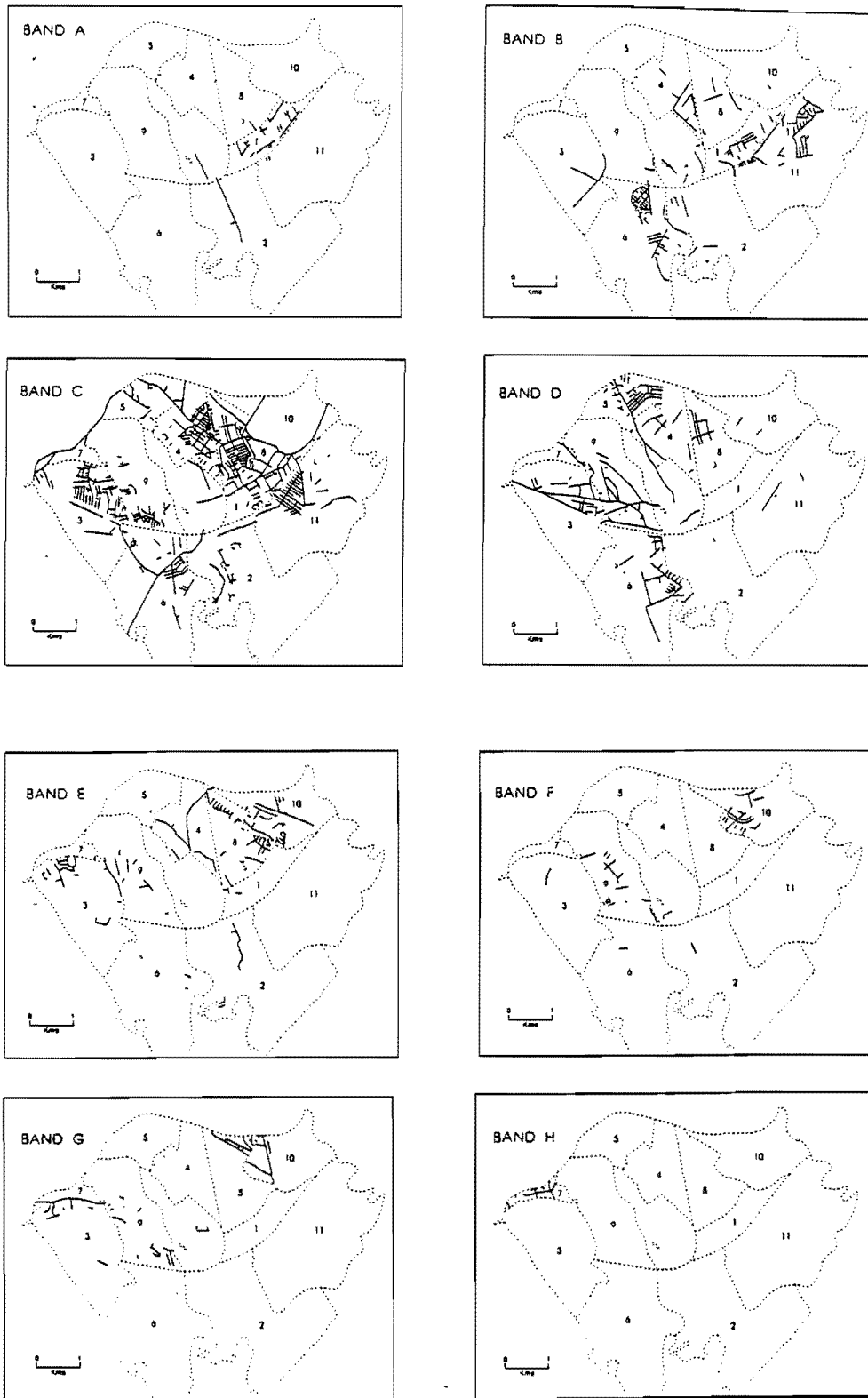


FIGURE 7. Allocation of streets to modal council tax bands

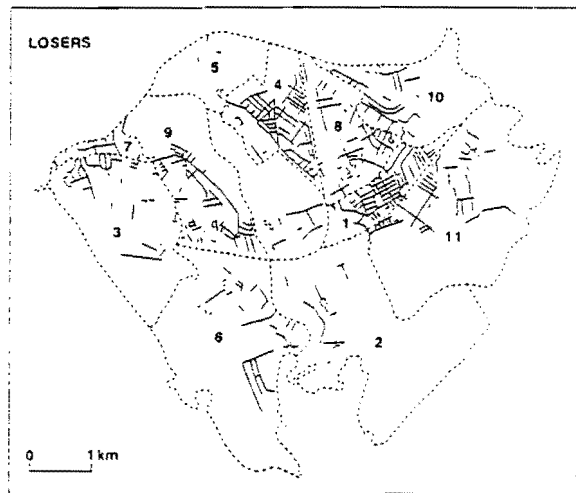
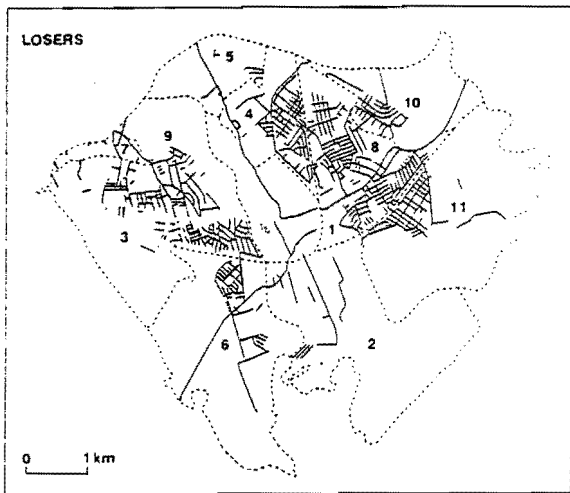
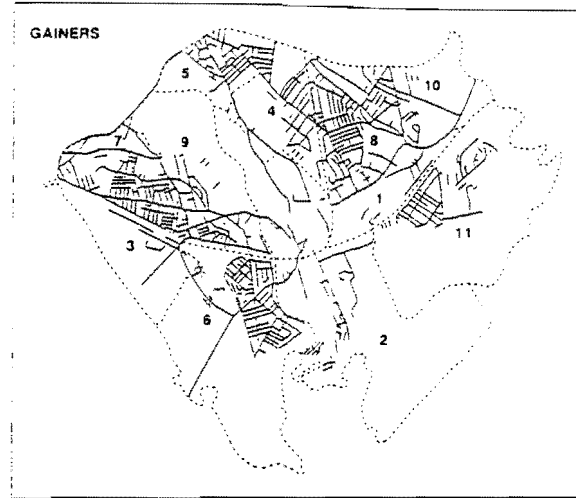
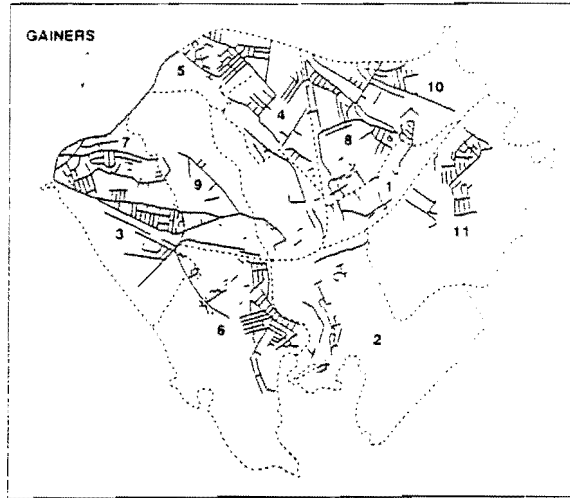


FIGURE 8. Redistributive consequences of the change from the domestic rates to the council tax

FIGURE 9. Redistributive consequences of the change from the community charge (with transitional relief) to the council tax

with and without a price survey sample property. This leads us to conclude that the observed contiguity effects are no mere artefact of our data modelling method. Comparison of this information with the street representation of domestic rates incidence allows us to gauge the spatial effect of the change in the basis to taxation (i.e. the introduction of a tax on capital rather than 'rentable' values) as well as to examine the effect of 'banding' of capital values in a spatial context. The council tax is regressive in that successive higher capital value thresholds are taxed at ever-decreasing rates, whilst the highest band of all (Band H) covers an open-ended range of capital values. Useful attempts have been made to understand the effects of these thresholds (Hills and

Sutherland, 1991), yet no detailed examination of the effects of these changes have been made in a spatial context. This is an important omission in the context of intra-urban study, particularly of long-established urban areas where processes such as demographic change, urban renewal, clearance and redevelopment will conspire over time to create divergence between the use and exchange values of dwellings. Rateable values have historically been more closely aligned with use values, whilst capital values come to reflect the many locational and other attributes that make a dwelling more or less desirable to a predominantly 'post-shelter' (Clark and Moore, 1980) society.

Figure 8 depicts the pattern of street gain or loss based upon the difference between mean street

domestic rates and council tax payable, where both regimes are constrained to raise the same total amount.⁵ There again appears to be a spatial pattern to gain and loss. The substantial properties in Llandaff, in much of Roath, and in parts of Riverside gain because of the regressive nature of the council tax at successively higher bands. Perhaps more unexpectedly, some well-established areas of modest dwelling stock lose, because of the low historical rateable values of the overwhelming majority of dwellings here: a similar phenomenon explains the losses incurred in parts of Cathays, Plasnewydd, Riverside and Splott. Butetown was the only part of the Inner Area to be extensively redeveloped in the 1960s, and this area is a net beneficiary of the introduction of the council tax, since although the basic dwelling type is small family houses, they had been assigned higher rateable values than older properties elsewhere in the Inner Area. Gabalfa gains for broadly similar reasons. There is also evidence that large dwellings in less fashionable areas of the City (e.g. Grangetown) benefit from the change, since the relative attractiveness of spacious stock has declined over time, yet such dwellings have retained high historical rateable values. Over-all, therefore, these results support the contention of previous research that residents of the most expensive dwellings will benefit from the change from open-ended rateable values to banded capital values, yet the broader pattern suggests that gains and losses may more generally arise from the spatially variable emergent pattern of gaps between use and exchange values. We intend to undertake further research in order to examine the socio-economic geography of gain and loss in more detail.

Our final comparative analysis anticipates the pattern of gainers and losers if the council tax is introduced with no transitional relief scheme in April 1993. This is shown in Figure 9. Despite the capped and regressive nature of the council tax, residents of streets comprising the most expensive dwellings are likely to lose from the change, as also (in common with Figure 8) are those residents of much smaller and lower-valued dwellings in areas of the city that have benefitted from community charge transitional relief. Butetown generally gains from the change, as only little transitional relief was given to this redeveloped community which is characterized by high rateable values relative to capital valuations. Gabalfa gains for some of the same reasons, although additionally this area has been occupied at quite a high residential density.

CONCLUSIONS

In simplistic terms the upheavals in local government revenue generation over the last four years can be represented as a lurch from property-based taxation to person-based taxation and back again. Each regime is in practice a hybrid of dwelling attributes and household characteristics, and in Wales the last year of the community charge has in effect sought to replicate the pattern of rates revenue generation using household numbers rather than historic rateable values as the generating mechanism. Speculation about the form of further transitional relief arrangements to accompany the introduction of the council tax suggests a very strong desire of central government for continuity in sharing out the local revenue burden, whilst the reluctance to reinstate local government revenue generation to the real levels of the even quite recent past suggests that this remains a sensitive policy issue.

Sensitive policies require sensitive tools for their implementation, and the preceding empirical analysis has demonstrated the utility of GIS in monitoring and modelling previous and future changes in pattern of local revenue generation. Our analyses broadly support the findings of economic analyses of recent and envisaged changes but, more importantly, clarify our conceptions about the geography of gain and loss. In the Welsh context, this has highlighted what we view as rather muddled thinking surrounding the use of communities to distribute transitional relief, and perhaps offers a clearer conception as to the purposes that any future transitional relief scheme might serve.

From a pragmatic standpoint, the flexibility inherent in displaying the results of our council tax model within a GIS environment might allow policy-makers to anticipate the pattern of appeals against valuation bandings, since such appeals are most likely to be legitimate in streets whose mean values lie close to council tax valuation band thresholds. Furthermore, our inferences about the emergent divergence between rateable and capital values for certain property types in certain communities serves to flag the dangers of adopting 'quick fix' solutions to the valuation task, e.g. by imputing capital values through application of a multiplier to existing rateable values. Finally, our information and analysis system appears successfully to identify consistent changes in the geography of local taxation and permits both continuity and change to be detected in the taxation of local communities.

ACKNOWLEDGEMENT

The authors are grateful to Alan Stevens and colleagues at Cardiff City Council for help in supplying public domain data for this project. The usual disclaimers apply.

NOTES

1. Integration of data from the Rates Register with the digitized street data base provides the least problems, since each property has a unique property reference number which incorporates its street identifier and HCS code. In order to investigate the geographical impact of the community charge it is necessary to use a publicly available surrogate to the Community Charge Register, and we have used the Register of Electors. Of course, this is a very imperfect source, for liability to pay the Charge does not imply eligibility to vote, and vice-versa, and it is not possible to devise disaggregate estimates of the numbers of individuals liable for reduced payments in the absence of Charge Register information: however, our previous investigations do reveal a broad correspondence at the community area level of aggregation between the two sources in Cardiff, and no systematically disruptive pattern to mismatches between them. In merging the information from the 1989 Rates Register with the 1991 Electoral Register (using a LOTUS 1-2-3 spreadsheet) a number of additional misclassifications occur, reflecting the renaming, creation and demolition of streets.
2. It is normal practice for vendors in Cardiff to commission estate agents on a 'sole agency' basis: it is unlikely, therefore, that any entries occur more than once in our capital values database.
3. Of course, given historical tenure patterns, variable neighbourhood stability, and so forth, it is unlikely that equal and wholly representative proportions of the total stock are available for sale at any one time. Even our enhanced sample may therefore be biased in terms of physical dwelling attributes, although this was not considered a major problem given the spread of private rental sector properties and the absence of very large tracts developed by the local authority sector. The sampled properties include ex-local authority houses offered for sale within predominantly local authority-owned estates. As with the official council tax valuations, there are inevitable difficulties in representing the valuations for such properties, and such difficulties are compounded when assessing dwelling types (such as flats and maisonettes) which have proven less popular under the 'Right to Buy' legislation. The Inner Area of Cardiff contains very few such properties, reflecting the historical pattern of development in the City.
4. The regression analysis was carried out using the 228 price survey dwellings for which paired capital values (CVAL) and rateable values (RVAL) were known. Simple

regression of the capital value against the rateable value gave the following results:

$$\text{CVAL} = 4003 + 358.64 (\text{RVAL}) \quad (1)$$

[1.29] [18.03]

$$\text{R-squared} = 59.0\% \quad \text{R-bar-squared} = 58.8\%$$

[t-statistics in brackets]. No. obs. 228.

where CVAL denotes the capital value of an individually paired hereditament; and RVAL denotes the rateable value of an individually paired hereditament.

The analysis also identified thirteen observations which constituted high residual and/or leverage points. Over half of these were concentrated in Roath, i.e. just one of the 12 Communities. Regression analysis using just those observations that lay within Roath yielded the following results:

$$\text{CVAL} = 38797 + 254.5 (\text{RVAL}) \quad (2)$$

[1.71] [2.42]

$$\text{R-squared} = 16.8\% \quad \text{R-bar-squared} = 13.9\%$$

[t-statistics in brackets]. No. obs. 31.

The size of the constant term is considerably larger than that for the Inner Area as a whole (Equation (1)) whilst the (statistically significant) slope term is rather smaller. This suggests that rateable values account for a much smaller proportion of capital values in Roath than elsewhere in the Inner Area. Certainly the concentration of unusual observations in Roath in the main analysis (Equation (1)) does suggest a departure from the Area-wide relationship in this Community. As a consequence, the following procedure was adopted for dwellings not allocated capital values under any of the procedures (i)–(iii) in Figure 2: if the dwelling lay in any Community *except* Roath, its rateable value was plugged into Equation (1) in order to impute a capital value; and if the dwelling lay in Roath, its rateable value was plugged into Equation (2) to obtain the value.

5. For comparative purposes we have constrained both the council tax and the domestic rates to raise the same amount – £11 017 233 – as we estimate would be raised by the community charge in 1992/3 if no student discounts were given. We have not attempted to model the numbers or geographical distribution of single occupant households with regard to the council tax, and this may have a marginal impact upon the street level distribution of gainers and losers between the two regimes.

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