

Vertical Consolidation and Financial Sustainability: Evidence from English Local Government

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Abstract. Proponents of the vertical consolidation of lower tier units into a smaller number of single-tier local governments suggest that it improves the financial sustainability of governments by generating economies of scale and scope. However, critics suggest that such structural change is beset with disruptive and unanticipated costs that outweigh any potential efficiency savings. I investigate the validity of these contrasting arguments by analysing the expenditure and fiscal health of English county councils before and after the consolidation of the lower tier units within several counties that took place in 2009. Levels of financial sustainability are modelled using a difference-in-differences estimator for the years 2003-2012. The results suggest that in the short run the consolidated governments have been able to realise administrative economies, but their fiscal health has weakened. These findings appear to be robust to the possibility of selection effects. Theoretical and practical implications are discussed.

Key words: local government reorganization; fiscal centralization; financial performance; scale economies; England

1 Introduction

Structural reform of local governments has a long history as a response to both perceived weaknesses in service provision and a desire to reap improvements in financial sustainability (Dollery, Byrnes and Crase, 2007; Fox and Gurley, 2006). Such reforms may involve the amalgamation of small organizations into a new bigger body, the disaggregation of large organizations into smaller units, consolidation of lower-tier units into a higher single tier, or the separation of a single into multiple tiers (Dollery and Robotti, 2008). In fact, central governments in countries all across the world have enacted, are enacting or are contemplating structural changes on the grounds of costs, efficiency and fiscal health (see, for example, *Local Government Studies*, 36, 2, 2010; and *Public Finance and Management*, 13, 2&3, 2013; Rodríguez-Pose and Gill, 2003). The trend has been particularly apparent in England where vertical consolidation and horizontal amalgamation of small units into larger ones, in an attempt to reap scale and scope economies has been the norm since the 1970s (John, 2010). The idea that big multi-purpose local governments will have lower costs per resident is based on the argument that large units are able to spread fixed administrative costs, generate productivity gains through improved resource-utilization and offer more services to more people from a smaller number of administrative bases. This argument applies especially to vertical consolidation, since multiple layers of administrative duplication can be eradicated by bringing the full range of local public services under the control of a single authority.

Although the putative benefits of structural reforms of local government are often touted by policy-makers (John, 1991; 2010), very little is actually known about whether new structures ever realize the anticipated scale and scope economies. There is an extensive literature on local government reorganization examining the scale economies it is supposed to generate in those organizations that might potentially be amalgamated (see Dollery, Grant and Kortt, 2012). Many of these studies suggest that bigger local governments are more

efficient (e.g. Duncombe and Yinger, 1993; De Boer, 1992), while others point towards the emergence of diseconomies of scale after a certain point (e.g. Breunig and Rocaboy, 2008; Drew, Dollery and Kort, 2012), or the absence of scale economies altogether (e.g. Derksen, 1988; Schofield, 1978). In fact, there may be a complex mosaic of linear and nonlinear size effects that vary across the different services provided by local governments (Department for Communities and Local Government, 2006a). This means it is difficult to predict with any certainty whether reorganizations will work on the basis of prior studies of economies of scale in existing units, and points towards the need for research on the effects of structural change. Yet, almost nothing is known about the outcome of reforms that involve the vertical consolidation of multiple lower-tier units within a single higher tier of government. There have been some systematic econometric analyses of the impact of the horizontal amalgamations of school districts in the United States (e.g. Gordon and Knight, 2008), and on municipalities in Israel (Reinegewertz, 2012). There are also a number of more descriptive studies that track changes in expenditure before and after vertical consolidation in Canada (Slack and Bird, 2013) and the United States (Faulk, Schaal and Taylor, 2013). However, the absence of econometric analyses that produce systematic evidence on the consolidation of lower tier into upper-tier units, makes it very difficult to draw firm conclusions about whether or not vertical consolidation is likely to work. Despite this evidence gap, many governments continue to regard such consolidation as a viable and efficacious reform strategy.

One of the reasons for the persistence of reorganization as a policy tool is not only the belief in economies of scale, but also the argument that fiscal centralization results in better local service outcomes. The ‘new regionalists’, in particular, suggest that centralizing control over local public services can be a means to averting debt formation, administrative duplication and corruption (Rodríguez-Pose and Gill, 2003; 2005). From this perspective, vertical consolidation can contribute to the fiscal discipline required to equalize spatial

variations in public sector expenditure, and may be necessary to generate the capacity required to leverage any scale and scope economies within the system (Prud'homme, 1995). Indeed, the case for the consolidation of lower-tier into upper-tier local governments in England has been based on the argument that single tier authorities have better service coordination, clearer accountability, and more streamlined decision making, as well as the greater efficiency associated with increased scale. That said, it is possible that the disruptive effects of structural change, such as goal displacement, personnel turnover, lower employee morale and planning blight (Hannan and Freeman, 1984) are the main outcome of local government consolidation – at least, in the short run. For example, the sparse evidence on the impacts of structural reform in England suggests that local government consolidation generated additional rather than reduced expenditure, at least during the period in which the new structures were being put in place (Andrews and Boyne, 2012).

Does the spending of consolidated local governments rise or fall following structural reform? Is the level of fiscal health greater or lower in consolidated organizations? In this paper, I seek to provide some preliminary answers to these important theoretical questions by applying a difference-in-difference estimator to the financial management of English county councils between the years 2003 and 2012. This set of organizations, and the time period in which the study is undertaken, represents a valuable context in which to examine the short-run effects of the vertical consolidation of local governments. In 2009, seven county councils in England underwent voluntary reorganization entailing the abolition of the lower tier units within the areas that they serve and the consolidation of the functions of those lower tier-units with those at the county level into nine new “unitary” authorities. Since local governments in the United Kingdom (UK) are very large by international standards and any scale economies may already have been exhausted, analysis of the 2009 reform represents a hard test of the

efficiency case for structural reform – though one that remains timely given its on-going popularity (Williams, 2014).

The paper will begin by developing theoretical arguments about the rationale for the vertical consolidation of local governments. The ways in which the financial sustainability of consolidated units of local government might evolve will then be explored. Thereafter, measures of local government expenditure and fiscal health, local government consolidation, and appropriate control variables will be identified and described, before the results of the statistical modelling are presented and discussed. Finally, the conclusion will seek to draw out theoretical and practical implications of the findings.

2. Vertical consolidation and financial sustainability

The financial sustainability of local governments is typically regarded as being a question of finding the optimum scale and structure for the cost-efficient delivery of vital local public services (see McGinnis, 1999). For policy-makers, the answer to this question is often thought to be that “bigger is better” or, at least, “cheaper”, and so local governments should be restructured to maximise the potential scale economies that might be present within the system. The consolidation of multi-tier local government systems into a simpler and more streamlined structure, in particular, has a venerable history as a means for seeking out these economies (see Anderson, 1925; Bish, 2001). Consolidated local government units are typically expected to benefit from greater economies of scale and scope. At the same time, vertical consolidation is also a means for national governments to pursue fiscal discipline and equalization by centralizing control over the distribution and management of public money.

Research suggests that subnational governments can run up large budget surpluses in the expectation that national authorities will ‘bale them out’ (Rodden, 2002). Small local governments may be particularly prone to financial mismanagement, especially as their

capacity for generating tax revenue is typically more restricted (and more critical) than larger units (Zafra-Gomez, Antonio and Perez, 2010). This problem may also be exacerbated in a multi-tier system, as different tiers often have different priorities and can blame each other for perceived failings in service delivery (Crampton, 1996), with citizens unable to determine who is accountable for such failures (National Centre for Social Research, 2000). In fact, difficulties assigning functions between different tiers of government and establishing legitimacy for policy decisions can generate inconsistent outcomes across the whole local government system (Dafflon, 1992; Rodríguez-Pose, Tijmstra and Bwire, 2009; West, Allmendinger, Nikolai and Barham, 2010). By contrast, centralized control over resource allocation, in theory, widens the scope for fiscal equalization and for reducing the influence of local interest groups over service delivery decisions, thereby improving the prospects of efficient use of resources (Rodríguez-Pose and Gill, 2003). In addition, supporters of fiscal centralization argue that higher tiers of government are able to pay higher salaries and therefore attract the best public managers, which, in turn, can assist them in unlocking any economies of scale and scope within the system (Prud'homme, 1995).

The anticipated scale and scope economies can become a powerful resource that can buffer consolidated organizations from the dangers posed by fiscal stress. By gaining greater ability to spread fixed costs across a larger client base and to share multiple inputs from single sites, consolidated organizations may lower their costs and become more financially sustainable in the long run. Nonetheless, despite widespread acknowledgement that the rationale underpinning amalgamations and consolidations is highly controversial, precious little systematic evidence has been generated to support or reject the claims made on behalf of vertical consolidation. Most studies of the impact of such structural reforms rely on descriptive statistics (e.g. Chisholm, 2002; Sancton, 1996; Vojnovic, 2000), rather than the kind of before and after econometric analysis that can disentangle the “true” impact of change

on the financial situation of governments. Although studies using such an approach have identified improved financial performance following horizontal amalgamation of similar units (e.g. Reingewertz, 2012), few investigate vertical consolidation and it is conceivable that the effects of structural change play out differently for this kind of reorganization.

Although consolidation is anticipated to result in the accrual of scale and scope economies, it is quite possible that expenditure will actually rise in consolidated units. First, the consolidated units may already have been operating at an optimum spatial scale within a multi-tier system, and when brought together accumulate new and unwanted overheads (Williamson, 1967). Second, the supposed benefits of fiscal decentralization, such as inter-jurisdictional tax competition and allocative efficiency, could dissipate when the scale of local service provision is expanded (Rodríguez-Pose and Gill, 2003). Third, the transitional costs associated with making structural change happen may be so great when abolishing lower tier units and merging them with a larger entity that the consolidated government cannot recapture the economies lost during reorganization (Chisholm, 2002).

Because bigger local governments accumulate more complex administrative overheads, they may eventually suffer from diseconomies of scale (Boyne, 1996; King and Ma, 2000; Schofield, 1978). Tullock (1965, page 51), for example, argues that eventually ‘the declining “marginal efficiency” associated with increasing size would guarantee that a point would be attained at which further gains from expansion would be less than the added cost.’ At the same time, diseconomies of scope could occur in a single-tier system if different services (or governments or agencies) retain their own support functions, and are unwilling to cooperate with each other. For instance, the so-called “silo mentality” that is sometimes thought to be present within the big departments within larger local governments (Cowell and Martin, 2003), may pose particular problems for the corporate centre of a newly consolidated organization that is seeking to reduce administrative duplication.

Consolidating several smaller lower tier units into a single higher tier may lead to the loss of the distinctive benefits associated with small-scale systems. In particular, advocates of fiscal decentralization claim that small units within a multi-tier local government system are best because this promotes efficiency-enhancing competition in a bid to attract mobile residents and businesses. Salmon (1987, page 32), for example, argues that in a horizontally fragmented system there is greater “incentive to do better than local government in other jurisdictions in terms of levels and qualities of services, of levels of taxes or of more general economic and social indicators”. Furthermore, smaller local governments may be closer to the communities that they serve and therefore provide better allocative efficiency than larger units (Rodríguez-Pose and Gill, 2003). All of these advantages could be lost following vertical consolidation.

In addition to the problem of bureaucratic congestion and the loss of the advantages of a decentralized system, consolidated local governments confront the challenge of managing the reorganization process. Organizational theories of structural change suggest that any positive effects from reorganization may take a long time to emerge in the face of disruption to existing routines and practices (Hannan and Freeman 1984). Within consolidating local governments, disruptive effects can include: goal displacement as politicians and managers are distracted from core responsibilities; high turnover, especially amongst dissatisfied managers who may leave or take early retirement; and ‘planning blight’, as strategic decisions are put on hold. “Overspending” may also occur, as governments ‘lock in’ preferred expenditures before consolidation takes place (Chisholm 2002). Hinnerich (2009) and Jordahl and Liang (2010) provide evidence that merging Swedish local governments accumulated excessive debts prior to being reorganized in the 1950s and 1970s.

The present study of local government vertical consolidation therefore adds to the prior literature in three ways: first, a systematic analysis of the implications of consolidating

several lower-tier units into a single tier for financial sustainability is offered; second, the consequences of the change process for financial sustainability is incorporated in the analysis by capturing disruptive effects occurring before the new organizations begin their work; this, in turn, permits assessment of the extent to which the potential realisation of scale and scope economies might outweigh the disruptive effects of the process of restructuring itself.

3 Empirical context, data and methods

English local governments are elected bodies that operate in territorially bounded geographical areas, employ professional career staff, and generally receive over two-thirds of their income from the UK central government. They are multi-purpose authorities delivering services in the areas of education, social care, land-use planning, waste management, public housing, leisure and culture, and welfare benefits. In England, prior to the consolidations that took place in 2009, there were 386 local governments of five types. 32 London boroughs, 36 metropolitan boroughs, and 46 unitary authorities mostly in urban areas delivering all of the services listed above; and in rural areas 34 county councils administering education and social services, and 238 district councils providing welfare and regulatory services. The areas served by county and district councils are the focus of this study.

County councils were first created in 1888, to carry out a range of public functions across the rural shires of England and Wales, whilst (with the exception of London county council) county boroughs were responsible for services in urban areas. During the 1890s, further reforms sub-divided the shires creating lower-tier district councils (Boyne and Cole, 1996). Then, in 1974, a formal two-tier structure of 39 counties and 296 districts was inaugurated. This structure was partially dismantled in some areas during the 1990s through the establishment of new unitary authorities providing all of the services previously delivered by district and county councils in large towns and smaller cities. Thereafter, this unitary,

single-tier full provision model became UK central government's preferred option for the local government system within rural areas, culminating in an invitation in 2006 to the 34 remaining two-tier areas to submit proposals for cross-county consolidation into a single tier (Department for Communities and Local Government, 2006b). Such consolidation would also see the abolition of the district councils within the consolidated areas.

In 2007, 26 proposals for consolidation were submitted from two-tier areas across England, of which 16 met central government's initial specified criteria and were put to a full, public consultation. Following this consultation and further assessment by officials and independent financial consultants, proposals for full consolidation from only five two-tier areas were given the go-ahead, along with a two-unitary option for two other areas, and on 1 April 2009 nine new unitary councils were established. In five county areas (Cornwall, Durham, Northumberland, Shropshire and Wiltshire) the district councils were abolished with the county councils becoming unitary authorities, providing all of the local public services within the jurisdiction that they serve. In two areas (Bedfordshire and Cheshire), the county and district councils were abolished and two new unitary authorities established in each area providing all of the services previously provided by the county and district councils.

The data used in this study to analyze the effects of consolidation on the areas receiving this policy "treatment" are drawn from two main sources: the Department for Communities and Local Government's Revenue expenditure and socio-economic deprivation statistics; and, the UK national census statistics and annual mid-term population estimates published by the Office of National Statistics. To facilitate the analysis of the effects of consolidation on financial sustainability it is necessary to define a unit of analysis that can be observed before and after consolidation occurs. Hence, to develop a longitudinal set of measures that pre-date and post-date the consolidations that took place in 2009, the financial

statistics for the district councils in each county area were aggregated together with those for the county council to get expenditure figures and measures of fiscal health for the entirety of the local government system within each county area. This transformation was applied to the consolidated areas in the period prior to reorganization (i.e. before 2009) and to the non-consolidated areas throughout the study period (2003-2012). However, for the two split counties that emerged from the reform of 2009, a slightly more complicated aggregation procedure was required for the period prior to consolidation. First, the financial statistics for the district councils that were absorbed into the new single-tier units were aggregated. Next, the proportion of the county council expenditure that was spent within the areas that were later consolidated was estimated by calculating what proportion of the population within the county resided in the soon-to-be consolidated district councils and then weighting the county expenditure for the two consolidated areas accordingly. This figure was added to the combined expenditure of the consolidated district councils to give an estimate of the overall financial situation within the split county areas prior to their actual consolidation in 2009.

3.1 Dependent variables

Expenditure per capita Theories of local government restructuring suggest that the benefits of consolidation are most likely to appear in savings in the financial resources expended on services. By contrast, organization theories tend to posit that the management of structural change generates additional costs until such time as the new structures have bedded down – something that could take many years. Even so, the patterns of spending that are observed in the wake of consolidation might vary across different service areas, as the consolidated governments opt to economise in some areas of service provision rather than others in order to recoup any costs incurred during the process of reorganization. To investigate the impact of consolidation on county government expenditures in full, the effects of the reform of 2009

on the total net service expenditure per capita of each county is therefore supplemented within analysis of the expenditure on the major local government services within county areas: education; social care; environmental services (e.g. waste management, environmental health); transport (e.g. highway maintenance, bus services); leisure and culture (e.g. libraries, sports centres, museums); administration (i.e. central support services); land use planning; and, social housing.

Fiscal health While expenditure figures can undoubtedly capture basic changes in the financial situation of consolidated governments, they do not tell the whole story in terms of the overall financial sustainability of these organizations. To gain a fuller picture of the financial viability of restructured local governments it is important to consider the effects of consolidation on their fiscal health. There are numerous ways in which “government’s exposure to or vulnerability to detrimental future fiscal shocks” can be measured (Jacob and Hendrick, 2013: page 17). For the purposes of this analysis, five different measures of fiscal health are used to evaluate the impact of consolidation on financial sustainability.

First, *per capita grant funding* from central government is measured to provide an indication of whether or not consolidation has made local governments more sustainable from the perspective of UK government. Second, the proportion of the overall expenditure that is funded via the local property tax (council tax) rather than central government transfers, or the “*self-income ratio*” (Carmeli, 2002) is measured to assess whether consolidated areas have become more or less dependent on central government funding. Third, the annual non-tax *income per capita* is measured to assess the capacity of governments to raise additional discretionary revenue. Data for this measure are publicly available only from 2005, so the income per capita estimates draw on a slightly shorter pre-reorganization period. Fourth, the potential for past fiscal health to determine future viability is evaluated by measuring the

level of *debt per capita*. Finally, the unallocated financial reserves available to each organization is measured to capture the liquid resources that can be used to buffer local governments from unexpected environmental shocks (Jacob and Hendrick, 2013).

3.2 Independent variables

Consolidated county The primary question to be addressed by the analysis is whether the financial situation of counties that were consolidated has changed in the wake of restructuring. To assess the effect of being assigned to the consolidation “treatment” group, a dichotomous variable is constructed, coding the counties that were consolidated one during the period 2009 to 2012 and all other counties zero.

Consolidating county To determine whether changes in the financial sustainability of consolidated counties are genuinely attributable to benefits of consolidation, it is important to control for the impact of the actual process of restructuring on the reformed areas. In the case of the consolidations that took place in 2009, the business of bedding in the new organizational structures for the consolidated counties began in 2006 following the announcement of the successful bids for reorganization. To assess the effects of the structural change process itself, a dichotomous variable is therefore constructed that codes the counties that were in the process of consolidating between 2006 and 2008 as one, and all other areas zero.

Post-reform period To ensure that the difference-in-difference estimator captures the “treatment effect” on the consolidated counties in the period following reorganization it is important to control for the post-reform time period. In addition to permitting the accurate statistical estimation of the treatment effect, a post-reform variable can control for any

additional confounding effects on the financial sustainability of counties that may be attributable to the time period in which consolidation occurred. To assess the effect of the post-reform period on expenditures and fiscal health, a dichotomous variable is therefore constructed, coding the years from 2009 to 2012 one and all other years zero.

Control variables

The prosperity of local residents was measured using a proxy for the capacity of local citizens to co-produce services: the average ward score on the indices of multiple deprivation throughout the study period for each county area; pressures of time and money in more deprived areas are likely to impede positive contributions to service provision (Williams, 2003), which, might in turn increase costs. Economies of scale may arise from spreading fixed costs over more units of output (see Boyne 1996). The potential effects of organizational size on financial sustainability are therefore controlled by using figures for each local government area drawn from the UK national census and the mid-year population estimates published by the Office of National Statistics. These population figures were then divided by the area of each county in square kilometres to give a measure of population density – local governments serving more densely populated areas might reap economies of scope (Grosskopf and Yaisawamg 1990). Skewness tests revealed that all the variables used in the analysis are distributed normally.

3.3 Descriptive analysis

Table 1 presents the descriptive statistics for all of the variables in 2005, the year immediately before consolidation was formally on the policy agenda. The table also compares those counties in which consolidation occurred with those in which it did not, to permit a preliminary exploration of the possibility that some kind of selection bias

attributable to the prior financial situation of the consolidated counties might be responsible for the findings that later emerge from the econometric analysis. The table highlights that the counties that were eventually consolidated were smaller, had higher levels of overall expenditure, and higher levels of education, central administrative and planning expenditure. However, no differences were observed between the levels of fiscal health, or the deprivation and population density in each group. The differences in population and in some areas of expenditure illustrate the importance of controlling for potential county-specific influences on changes in financial sustainability. Nevertheless, since the consolidated areas were smaller than those that were not consolidated, further tests are undertaken later to assess whether selection bias associated with the decision to allow some consolidations to go ahead rather than others might affect the difference-in-difference estimates that are presented below.

[Position of TABLE 1]

Before turning to the difference-in-difference estimates, an initial examination of some basic statistics is carried out. First, a graphical illustration of the effect of consolidation on financial sustainability is provided in figures 1-14, before the difference-in-difference descriptive statistics are presented in table 2. The figures show the evolution of expenditures within counties before, during and after the reform period, with the vertical line in the centre denoting the final financial year prior to reorganization. They also illustrate the impact of central government budget cuts in 2011 on county expenditures. Figure 1 indicates that the overall expenditure of consolidated and non-consolidated counties follows a broadly similar trajectory, with the consolidated counties continuing to exhibit a higher level of total spending between 2003 and 2012. This pattern is repeated for education, social care, environment, transportation, leisure and culture, and planning expenditures. Also of note here

are the sharp drops in education, transportation, leisure and culture, and planning expenditures following the budget cuts of 2011, the continuing upward slope of social care expenditure, and the u-shaped trajectory of the self-income ratio. This highlights that the budget cuts are forcing English local governments to make choices about service priorities.

At the same time as there being areas of continuity between the two comparator groups, there are some distinctively diverging trends in the financial situation of consolidated and non-consolidated counties. In particular, there is a dramatic spike in the administrative expenditure of consolidated counties in 2008, the year prior to the actual inauguration of the consolidated units. This, in turn, is followed in the subsequent years by an equally striking reduction in administrative costs to a level below that found in non-consolidated counties. An equivalent pattern is observed in the reserves per capita for the two groups of counties, with those that were consolidated seemingly storing away reserves during the process of restructuring and then allocating those reserves straight after consolidation. At the same time, non-consolidated counties appear to be storing up “rainy-day” funds to cope with the budget cuts handed down to them by central government (see Audit Commission, 2012, for a discussion of this phenomenon).

[Figures 1-14]

The graphical findings described above are given added weight in the initial difference-in-difference analysis shown in Table 2. In this table, the financial situation of consolidated and non-consolidated counties is shown before and after consolidation occurred. The “first difference”, between the periods before and after consolidation, is shown in the third column. These figures indicate that spending on nearly all services was higher in the post-consolidation period for both consolidated and non-consolidated counties, though

administrative costs actually fell in consolidated areas. In terms of fiscal health, the level of central grant increased in both consolidated and non-consolidated counties, as did debt levels. However, income and reserves levels fell in consolidated areas, whereas they rose elsewhere. The “second difference” is presented in the fourth column. These figures represent the difference between the first difference for the consolidated and non-consolidated counties. As such, they can be read as simple estimates of the “treatment effect” associated with consolidation. Only three of these second differences are statistically significant: the reduction in administrative costs, income and reserves in consolidated counties.

[Position of TABLE 2]

3.4 Statistical model

The statistical model is a difference-in-differences panel regression evaluating the effects of consolidation on the costs and fiscal health within the reorganized county areas. Fixed effects estimation accounts for county-specific (unobserved fixed) effects, allowing for correlations between those effects and the (observed) effects of the explanatory variables, both of which can bias random-effects estimates (Halaby 2004). Moreover, using the Hausman test, systematic differences were found between the coefficients for fixed and random effects models of change over time within English counties, so the fixed effects estimator is used as it is more efficient.

The variables used in the regression models cover a ten year period from 2003 through 2012; these data were pooled and panellized by year and unit of analysis. Dummy variables for each year of the analysis (minus one) (π) were added to the model to control for the effects of idiosyncratic events within individual years, such as a change of cabinet

minister in the national government or the introduction of new legislation pertaining to local government.

The basic specifications that are estimated can be represented as follows, where financial sustainability (FS) in county i in year t is a function of the organization's fixed characteristics (α_{it}), the years of the post-reform period after consolidation (i.e. 2009-12) (PRP_{it}), a dummy variable coded 1 for consolidated counties in the years following consolidation (CD_{it}), and a dummy variable coded 1 for consolidated counties in the restructuring period (i.e. from the announcement of a successful reorganization bid in 2006 until 2008 prior to full consolidation) (CG_{it}). In addition, a vector (X_{it}) incorporating the control variables is included, plus measurement error (ε):

$$FS_{it} = \alpha_{it} + PRP_{it} + CD_{it} + CG_{it} + X_{it} + \pi + \varepsilon \quad [1]$$

A further development to this basic specification was also undertaken. To control for the possibility that the estimates produced by the basic specification are tainted by selection bias, the consolidated governments are compared to the sub-group of eight counties that applied for the opportunity to reorganize but were not granted permission to do so by UK central government. Restricting the difference-in-difference estimations to these two groups revealed similar results to those that are presented for the basic specification, adding confidence that the findings for our basic specification that are presented below may be robust to selection effects (see Tables 2A and 3A in the Appendix). Nonetheless, statistically significant differences between the population and total expenditure of the consolidated and this control group were again observed (see Table 1 A in the Appendix).

To provide further confidence that selection effects are not biasing the estimates unduly, a matching estimator was utilised to pair consolidated areas with similar non-

consolidated areas before applying the difference-in-difference estimations. Population is used as the first matching criterion, before the other control variables and the level of education expenditure are also utilised to derive alternative comparators. This analysis also produced similar results to those presented for the basic specification (the estimates for total expenditure are shown in Appendix B; the full results are available on request).

4 Statistical results

The results of the difference-in-difference estimations are presented in the following sequence. Nine models are presented in table 3: model 1 regresses the consolidation, consolidating and post-reform period measures and the control variables on to the net service expenditure per capita of English counties between 2003 and 2012; the subsequent models repeat that estimation strategy for the other key areas of expenditure within English local governments. In Table 4, the treatment effect for each year following consolidation is estimated for the expenditure measures. Following that, Table 5 presents the results of the empirical exploration of the effects of consolidation on the fiscal health of counties. These equations, incorporating the same independent variables as those shown in Table 3, estimate changes in grants, the self-income ratio, income, debt and unallocated reserves within counties. The average Variance Inflation Factor (VIF) score for the independent variables in all of the models is less than 2, which suggests the results are not likely to be distorted by multicollinearity. The standard errors are clustered at county level to reduce the potential for serial correlation and heteroscedasticity to bias the estimates. All of the dependent variables entered in the statistical models were log-transformed prior to the analysis.

[Position of TABLE 3]

The model shown in Table 3 explains nearly ninety-five per cent of the variation in the total expenditure of English counties, with a high R^2 of more than 0.5 also observed for spending on education, social care, environmental services, transport and leisure and culture. The levels of explained variation in counties' administration, planning and housing expenditure are not as high, but are nonetheless statistically significant (see F-statistics). The control variables do not generally make a statistically significant contribution to the explanatory power of the models, but there is some evidence of scale economies in social care and administration and of scope economies in transportation services, which seemingly cost less in urbanised areas. By contrast, scope diseconomies are observed for social care. For each aspect of local government expenditure, bar housing, spending went up, on average, by a statistically significant amount during the post-reform period. Since the cuts to English local governments only took force in 2011 and are likely to continue for the foreseeable future, it is possible that the positive coefficient for the post-reform period will turn negative in 2-3 years' time

The statistical results for the main independent variables of interest imply that the supposed benefits of consolidation for local government spending are not yet emerging for those English counties that were reorganized in 2009. Although the coefficient for consolidated counties is negative in the case of six out of nine of the expenditure items (including total expenditure), it only achieves statistical significance for administrative expenditure. In fact, substantive interpretation of the consolidated coefficient for administration expenditures suggests that, on average, reorganized counties benefit from "back office costs" that were nearly fifty per cent lower than prior to consolidation; what amounts to a saving of about £20 per capita in the four years since the reform that are studied here. This saving in the costs of administration was one of the main inspirations behind the reforms undertaken in 2009 (see Andrews and Boyne, 2009). However, it seems unlikely that

a saving of this magnitude is sufficient alone to justify reorganization. While there do not appear to have been efficiency gains in the provision of front-line services, it is, of course, quite possible that one might not expect to see economies here, since in many cases the personnel responsible for service delivery are likely to still be employed in the same locations doing similar work as before consolidation. All the same, the reasons for the absence of front-line savings is an important issue that could be addressed both by extending the time period of the econometric analysis further forward and through qualitative research in the reorganized counties.

Another potential explanation for the absence of robust statistically significant reductions in expenditure is that consolidated counties are still struggling to overcome the costs associated with making the new single-tier structure work. The coefficient capturing the effects of consolidating counties is positive for total expenditure, though it is not statistically significant. However, a statistically significant increase in expenditure on social housing is observed for consolidating counties. Substantive interpretation of this coefficient suggests that during the consolidating phase housing spending increased within the consolidated counties by, on average, nearly thirty per cent, or around £10 per capita between 2006 and 2008. Taken in combination, then, the statistical estimates for the effects of consolidation and the consolidating process suggest that the new counties may have recovered some of the costs of restructuring through the subsequent fall in administrative costs. As yet though, the anticipated scale and scope economies in service provision do not seem to have been realised. All of which casts some doubt on the merits of consolidation as a means to generate meaningful efficiency savings from local governments within a two-tier system. Nevertheless, it is possible that the aggregated treatment effect coefficient is masking the emergence of efficiency gains in the later years of the study. To provide a preliminary

evaluation of this possibility, the treatment effect on expenditures is next estimated for each year following the reform of 2008.

[Position of TABLE 4]

The estimates presented in Table 4 illustrate the changing levels of expenditure year-on-year for consolidated counties following reorganization. There is no clear pattern in the evolution of total expenditure in consolidated counties, but it is apparent that administrative savings grew in the years following reorganization: the coefficient for consolidated counties is negative and statistically significant for administrative expenditure per capita in 2010, and remains significant increasing in size in 2011 and 2012. Although there are only two other statistically significant coefficients (education and planning expenditures in the first year following consolidation), for certain other areas of expenditure it is possible to discern emerging trends. In particular, costs in social care and environmental services seem to be increasing in consolidated counties, though the consolidated coefficient does not achieve statistical significance in any of the years. All in all, these findings for the year specific treatment effects indicate that, aside from “back-office” savings, the anticipated improvements in financial performance do not appear to be coming through as the new organization structures gradually become “bedded-in”. Nonetheless, extending the timeframe of the study would be necessary to affirm this interim conclusion. To explore whether other aspects of financial sustainability have improved in the wake of consolidation, the effects of the 2009 reorganization on grants per capita, self-income, income per capita, debt and reserves per capita are considered next.

[Position of TABLE 5]

Three of the models presented in Table 5 explain over two-thirds of the variation in the dependent variable (grants, self-income and debt), while those estimating income and reserves per capita explains between 30 and 40 per cent of the variation in the dependent variable. In terms of statistically significant control variables, socio-economic deprivation appears to be positively related to the self-income ratio, which is surprising, but may reflect the larger budget cuts experienced by governments with higher levels of need (Stabe and Jones, 2011). The size and density of county populations seems to make no difference to the measures of fiscal health. Nevertheless, during the post-reform period, dependence upon central government grants increased across all counties relative to the previous period, as did levels of debt. At the same time, reserve levels have increased, almost certainly as part of a deliberate strategy to buffer counties from their worsening situation on the other indicators of spending and fiscal health.

Turning to the main variables of interest, it seems as though consolidation has had little impact on fiscal health, but may have resulted in lower reserve levels. The coefficient for consolidated counties in the model estimating unallocated reserves is negative and statistically significant. The coefficient for consolidating counties is positive and statistically significant for reserves, indicating that reorganized governments may have built up their reserves during the process of restructuring. When contrasted with the state of those reserves following consolidation, it would seem that the slack created during the consolidating phase was accumulated with the purpose of smoothing over the difficulties of making the new entities work in the period immediately following consolidation. Of course, whether or not a high or low level of slack is a good or a bad thing can often depend on whether or not one believes that public organizations should be “lean and mean” (see Meier and O’Toole, 2009). Either way, it seems clear that the consolidated counties of England now have fewer slack

resources to buffer themselves from the potentially damaging effects of the central government cuts to their budgets than they did prior to reorganization.

5 Conclusion

This paper draws upon a difference-in-difference methodology to examine the short run effects of vertical consolidation on the financial sustainability of English counties. The statistical analysis suggests that few of the desired financial outcomes were realised, at least in the immediate aftermath of structural change. The findings do not provide strong confirmation of the arguments in favour or against fiscal centralization, but are in line with previous descriptive analyses of vertical consolidation that suggest the realisation of scale economies via restructuring may not be as straightforward as policy-makers imagine (e.g. Chisholm, 2002; Faulk, Schaal and Taylor, 2013; Slack and Bird, 2013). As such, the findings stand in contrast to the pronouncements of policy-makers and to the savings identified in Reinegewertz's (2012) systematic econometric analysis of the impact of horizontal municipal amalgamations in Israel. There are several reasons why this might be so.

Firstly, vertical consolidation of several lower-tier units into a single higher tier may pose more coordination challenges than the horizontal merger of two governments providing similar services. It is conceivable that the costs of vertical consolidation of multiple units will therefore take longer to recoup than those associated with horizontal amalgamation. Secondly, English local governments are extremely large by international standards (John, 2010), with counties being an especially large unit of government. It is possible that any economies of scale have already been exhausted within English counties and that the sheer magnitude of effort required for restructuring makes it difficult to capture further efficiencies. Finally, English county councils serve rural areas which may have very different needs to the urban local governments that have formed the setting for most prior research. Feinerman et al

(2011) identify cost-savings from the simulated amalgamation of similar units of rural government, but more research is required to understand whether the effects of vertical consolidations and horizontal amalgamations vary across urban and rural contexts.

While the statistical findings presented here illustrate important dynamics in the vertical consolidation of governments, the study has clear limitations. In particular, there is a need to study the effects of consolidation for a longer timeframe. New entities may struggle to make working relationships and structures gel, and elected representatives must grapple with the development of a coherent political identity that is recognisable to, and supported by, residents (Copus, Crowe and Clark, 2005). Future studies of vertical consolidation and financial sustainability should therefore seek to build on this analysis of short run effects by analysing the medium to long run effects of reform some ten years or more after it has occurred. A further limitation of the study is the small sample size. While the restructuring of English county areas that occurred in 2008 represents a valuable ‘natural experiment’ which facilitates analysis of the effects of vertical consolidation, it is difficult to generalize the findings from such a small treatment group. Finally, although the effects of central government budget cuts are partially controlled through the inclusion of year fixed effects, in-depth case studies within the new governments would be needed to disentangle how, and in what ways, their financial management has been affected by the reduction in their budgets. Econometric analyses of the impact of vertical consolidations undertaken during times of fiscal plenty would also provide a valuable counterpoint to the unique circumstances English local governments currently confront.

The findings from this study indicate that it is possible to gain improvements in administrative efficiency from vertical consolidation, but that the full costs of the restructuring process may take time to recoup. Arguments for and against fiscal (de)centralisation thus receive mixed support from this analysis of the financial sustainability

of English local governments. All of which suggests that large-scale structural reforms should only be undertaken on the basis of careful long-term financial projections, rather than the short-term political imperative of making quick savings.

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Table 1. Descriptive statistics (2005)

	All	Consolidated	Non-consolidated	Difference
Observations	36	9	27	
<i>Expenditure per capita</i>				
Total	1461.0 (96.7)	1538.1 (115.8)	1435.2 (765.6)	102.9*
Education	675.6 (54.3)	716.9 (63.9)	661.8 (43.8)	55.1*
Social care	308.0 (33.1)	314.5 (40.2)	305.8 (30.9)	8.7
Environment	82.9 (8.2)	86.7 (8.5)	81.6 (7.8)	5.1
Transport	53.7 (8.4)	54.9 (7.3)	53.3 (8.9)	1.6
Leisure and culture	51.9 (7.4)	53.3 (10.7)	51.4 (6.1)	1.9
Administration	42.9 (15.9)	50.8 (14.7)	40.3 (15.7)	10.5+
Planning	30.8 (8.2)	37.5 (8.8)	28.5 (6.7)	9.0*
Housing	27.5 (14.8)	27.3 (12.5)	27.5 (15.7)	-2
<i>Fiscal health</i>				
Grants pc	1147.5 (111.6)	1214.7 (147.7)	1125.1 (89.3)	90.6
Self-income ratio	28.1 (2.8)	26.7 (2.6)	28.6 (2.7)	-1.9
Income pc	430.8 (54.1)	411.6 (33.2)	437.2 (58.6)	-25.6
Debt pc	47.2 (15.7)	46.3 (18.8)	47.5 (15.0)	-1.2
Unallocated reserves pc	47.3 (18.6)	50.6 (22.5)	46.2 (17.4)	4.4
<i>Controls</i>				
Population	638,042 (296,011)	347,777 (121,182)	757,300 (275,958)	-409,533**
Population density	259.3 (136.0)	218.7 (112.4)	281.0 (143.9)	-62.3
Deprivation	15.4 (4.6)	17.0 (6.3)	14.8 (6.3)	2.2

Note: Standard deviations in parentheses. + $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$ (two-tailed tests).

Table 2. Financial situations of consolidated and non-consolidated governments before and after consolidation

		Before (2003-08)	After (2009-12)	Dif	Dif in dif
<i>Expenditure per capita</i>					
Total	Consolidated	1569	1801	232**	-9
	Non-consolidated	1475	1716	241**	
Education	Consolidated	723	769	46+	-15
	Non-consolidated	679	741	61**	
Social care	Consolidated	314	383	69**	6
	Non-consolidated	306	370	63**	
Environment	Consolidated	88	105	16**	3
	Non-consolidated	83	95	13**	
Transport	Consolidated	63	70	7+	-2
	Non-consolidated	57	67	9**	
Leisure and culture	Consolidated	55	56	1	2
	Non-consolidated	51	50	-1+	
Administration	Consolidated	61	49	-13	-17**
	Non-consolidated	50	54	4	
Planning	Consolidated	37	35	-2	-4
	Non-consolidated	28	30	2	
Housing	Consolidated	31	34	3	3
	Non-consolidated	27	28	0	
<i>Fiscal health</i>					
Grants pc	Consolidated	1214	1429	215**	11
	Non-consolidated	1140	1345	204**	
Self-income ratio	Consolidated	27	27	0	0
	Non-consolidated	29	29	0	
Income pc (05-08)	Consolidated	470	423	-47	-85**
	Non-consolidated	463	501	38*	
Debt pc	Consolidated	45	65	19+	3
	Non-consolidated	45	61	16**	
Unallocated reserves pc	Consolidated	55	44	-11	-22**
	Non-consolidated	46	58	11*	

Note: + $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$ (two-tailed tests).

Table 3. Local government consolidation and expenditure per capita (log)

Variable	Total	Education	Social care	Env'ment	Transport	Leisure & Culture	Admin	Planning	Housing
Consolidated (2009-12)	-.012 (.013)	-.026 (.021)	-.013 (.012)	.030 (.039)	-.045 (.060)	.034 (.036)	-.488** (.119)	-.151 (.095)	.219 (.257)
Consolidating (2006-08)	.005 (.006)	-.001 (.011)	-.015 (.012)	.014 (.019)	.003 (.038)	-.013 (.022)	-.080 (.087)	-.067 (.049)	.265* (.125)
Post-reform period (2009-12)	.391** (.012)	.354** (.017)	.411** (.022)	.402** (.028)	.518** (.047)	.217** (.035)	.380** (.087)	.330** (.085)	.270 (.180)
Deprivation	.0002 (.001)	-.001 (.002)	.005* (.002)	-.001 (.004)	.006 (.007)	-.0002 (.004)	.001 (.011)	-.006 (.005)	-.006 (.024)
Population	-2.67E-07 (4.48E-07)	-4.53E-07 (6.53E-07)	-2.02E-06* (9.24E-07)	-8.23E-07 (1.35E-06)	9.87E-07 (1.38E-06)	4.74E-07 (1.14E-06)	-6.82E-06* (3.44E-06)	2.93E-06 (2.52E-06)	5.07E-06 (5.91E-06)
Population density	.001 (.001)	.002 (.001)	.004+ (.002)	-.0001 (.002)	-.006* (.003)	-.001 (.002)	.004 (.006)	-.006 (.005)	.002 (.010)
Constant	7.014** (.177)	6.176** (.294)	5.809** (.304)	4.753** (.491)	4.785** (.633)	3.790** (.468)	7.133** (1.438)	3.051 (.929)	-.627 (2.321)
F statistic	827.65**	604.27**	193.38**	141.32**	59.81**	28.84**	12.71**	15.21**	7.21**
R ²	.96	.87	.86	.77	.73	.60	.27	.39	.18

Notes: number of observations = 360. + $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$ (two-tailed tests). Standard errors (in parentheses) clustered by local government. Dummy variables for individual years not shown.

Table 4. Local government consolidation and expenditure per capita (log) (year specific treatment effects)

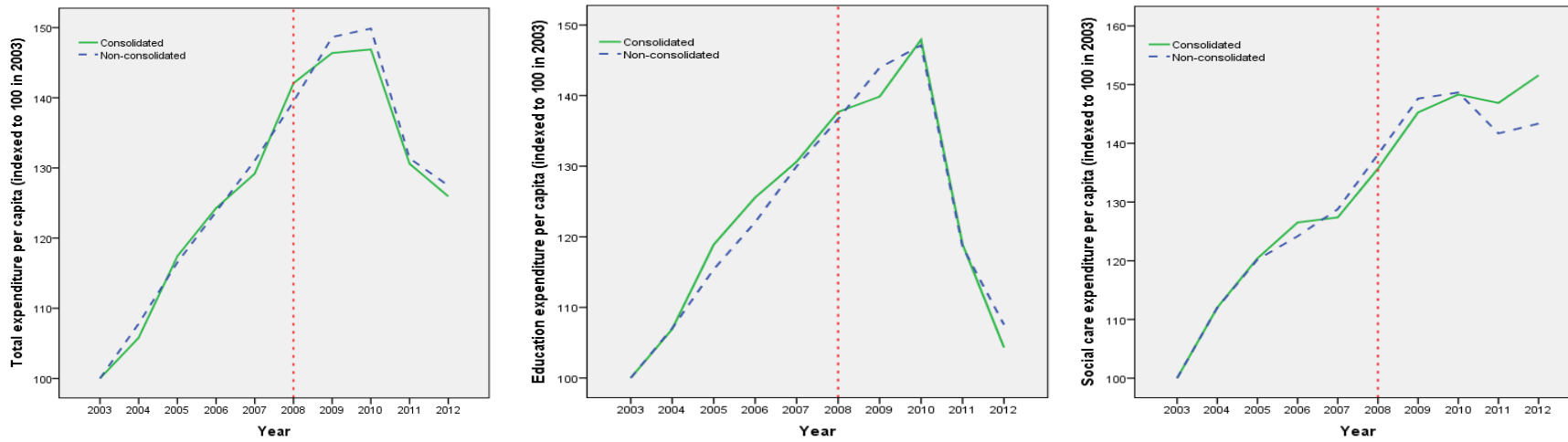
Variable	Total	Education	Social care	Env'ment	Transport	Leisure & Culture	Admin	Planning	Housing
Consolidated 2009	-.013 (.016)	-.043* (.018)	-.045 (.051)	.015 (.052)	-.024 (.061)	.021 (.052)	-.415 (.250)	-.286** (.103)	.109 (.248)
Consolidated 2010	-.019 (.015)	-.010 (.021)	-.031 (.032)	.013 (.042)	-.034 (.056)	.047 (.044)	-.470** (.129)	-.033 (.110)	.230 (.261)
Consolidated 2011	-.004 (.016)	-.008 (.034)	.003 (.042)	.040 (.051)	-.065 (.075)	.045 (.048)	-.564** (.132)	-.062 (.105)	.316 (.317)
Consolidated 2012	-.010 (.022)	-.042 (.051)	.027 (.039)	.053 (.066)	-.060 (.075)	.022 (.048)	-.512** (.128)	-.209 (.137)	.236 (.312)
R^2	.96	.87	.87	.77	.73	.60	.27	.42	.18

Notes: number of observations = 360. + $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$ (two-tailed tests). Standard errors (in parentheses) clustered by local government. All equations control for all the other variables included in Table 3. Dummy variables for individual years not shown.

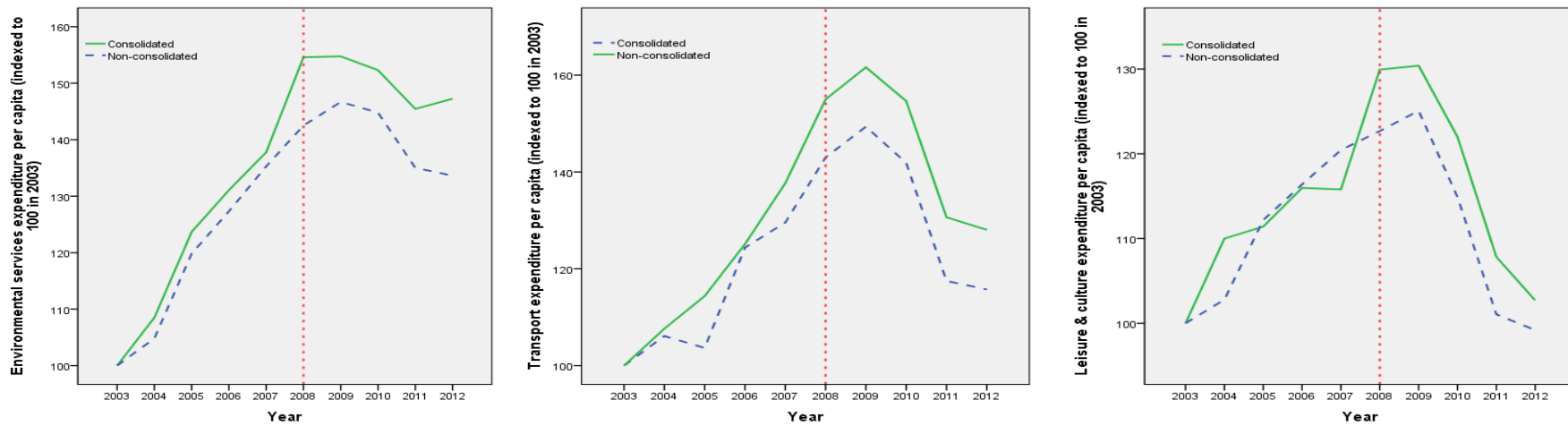
Table 5. Local government consolidation and fiscal health

Variable	Grants per capita	Self-income ratio	Income per capita (2005-12)	Debt per capita	Reserves per capita
Consolidated (2009-12)	-.005 (.016)	.002 (.017)	-.107 (.068)	.124 (.120)	-.464** (.126)
Consolidating (2006-08)	.002 (.010)	-.010 (.008)	.112* (.042)	.138 (.101)	.150+ (.078)
Post-reform period (2009-12)	.257** (.019)	-.103** (.011)	-.056 (.040)	.433* (.181)	.420** (.087)
Deprivation	.0002 (.001)	.004** (.002)	.002 (.010)	-.003 (.015)	-.010 (.008)
Population	-6.25E-07 (6.25E-07)	3.75E-06 (5.03E-05)	3.48E-06 (2.61E-06)	2.52E-06 (4.50E-06)	-1.14E-06 (3.33E-06)
Population density	.002* (.001)	-.001 (.001)	-.009+ (.005)	-.001 (.007)	-.004 (.006)
Constant	6.619** (.220)	3.432** (.163)	6.288** (.632)	2.280 (1.822)	5.679** (1.172)
F statistic	446.59**	67.52**	10.67**	21.96**	10.36**
R ²	.94	.70	.31	.66	.37

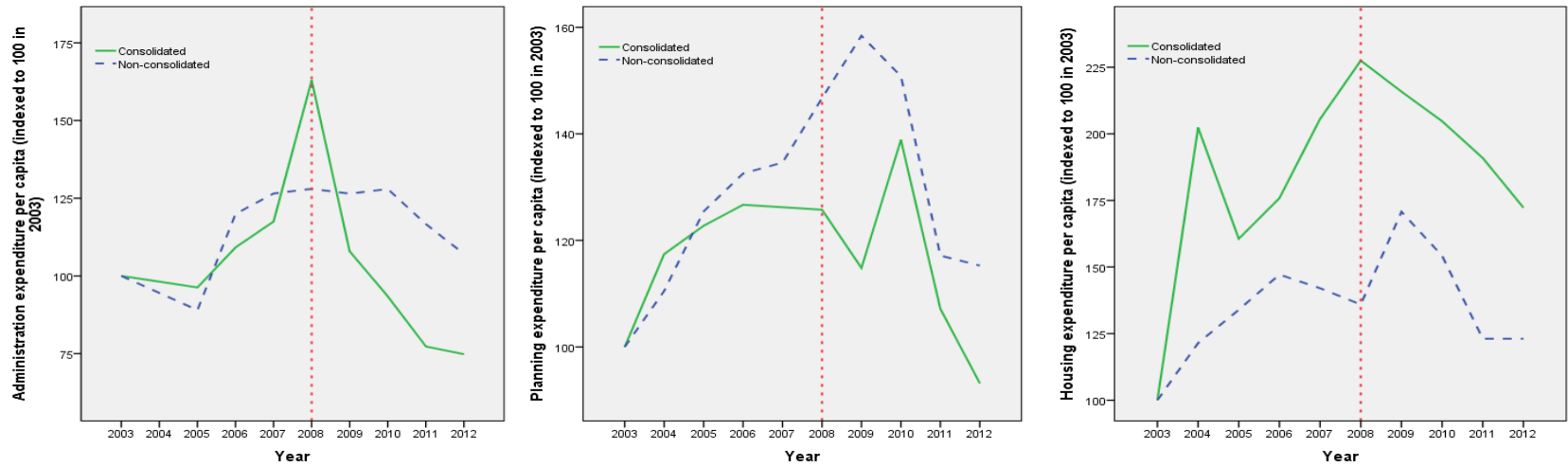
Notes: number of observations = 360. + $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$ (two-tailed tests). Standard errors (in parentheses) clustered by local government. All dependent variables log-transformed. Dummy variables for individual years not shown.



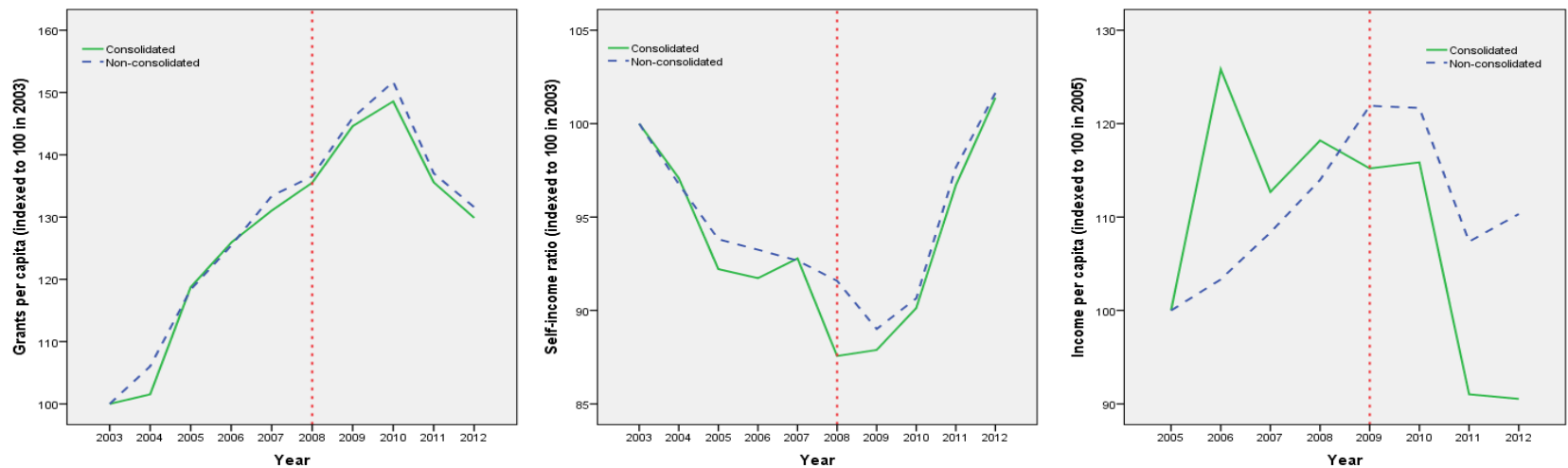
Figures 1-3. Expenditures per capita (2003-12) in consolidated and non-consolidated counties: *total, education and social care*



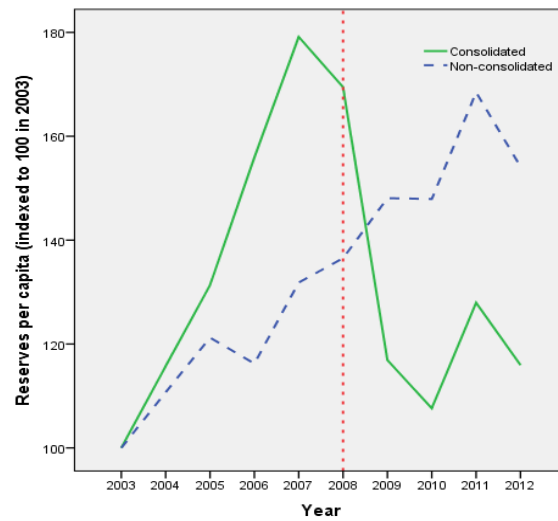
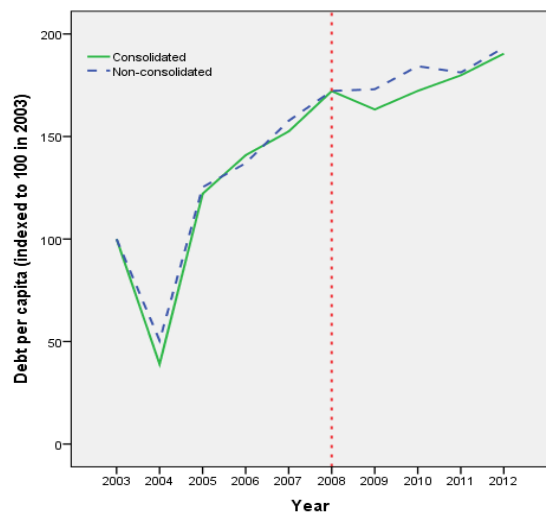
Figures 4-6. Expenditures per capita (2003-12) in consolidated and non-consolidated counties: *environment, transport and leisure and culture*



Figures 7-9. Expenditures per capita (2003-12) in consolidated and non-consolidated counties: *administration, planning and housing*



Figures 10-12. *Grants per capita, self-income ratio (2003-12) and income per capita (05-12) in consolidated and non-consolidated counties*



Figures 13-14. *Debt per capita and reserves per capita (2003-12) in consolidated and non-consolidated counties*

Appendix A.

Table 1A. Descriptive statistics (2005)

	Consolidated	Nearly-consolidated	Difference
Observations	9	8	
<i>Expenditure per capita</i>			
Total	1538.1 (115.8)	1464.8 (53.4)	73.3
Education	716.9 (63.9)	657.2 (44.8)	59.7*
Social care	314.5 (40.2)	310.6 (25.5)	3.9
Environment	86.7 (8.5)	83.9 (8.3)	5.1
Transport	54.9 (7.3)	59.6 (7.4)	-4.7
Leisure and culture	53.3 (10.7)	51.3 (5.2)	1.9
Administration	50.8 (14.7)	38.8 (15.0)	12.0
Planning	37.5 (8.8)	26.4 (5.5)	11.1**
Housing	27.3 (12.5)	36.8 (18.2)	-9.5
<i>Fiscal health</i>			
Grants pc	1214.7 (147.7)	1161.8 (63.6)	52.9
Self-income ratio	26.7 (2.6)	27.8 (2.0)	-1.1
Income pc	411.6 (33.2)	424.7 (58.4)	-13.1
Debt pc	46.3 (18.8)	55.2 (6.3)	-8.9
Unallocated reserves pc	50.6 (22.5)	41.5 (13.7)	9.1
<i>Controls</i>			
Population	347,777 (121,182)	705,587 (215,044)	-357,810**
Population density	218.7 (112.4)	173.3 (108.0)	45.4
Deprivation	17.0 (6.3)	16.8 (3.7)	.2

Note: Standard deviations in parentheses. + $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$ (two-tailed tests).

Table 2A. Local government consolidation and expenditure per capita (log) (consolidated compared with nearly consolidated)

Variable	Total	Education	Social care	Env'ment	Transport	Leisure & Culture	Admin	Planning	Housing
Consolidated (2009-12)	-.0003 (.016)	-.022 (.032)	-.023 (.033)	.023 (.059)	-.086 (.079)	.054 (.057)	-.489** (.126)	-.268+ (.095)	.174 (.326)
Consolidating (2006-08)	.010 (.008)	.007 (.014)	-.017 (.022)	.033 (.025)	-.019 (.045)	-.013 (.033)	-.115 (.144)	-.149+ (.049)	.147 (.155)
Post-reform period (2009-12)	.352** (.019)	.317** (.034)	.378** (.049)	.369** (.051)	.558** (.104)	.197** (.066)	.526** (.213)	.236 (.198)	.710** (.329)
Deprivation	-.002 (.001)	-.002 (.003)	.005 (.004)	-.005 (.003)	.004 (.009)	.004 (.003)	.007 (.011)	-.021* (.008)	.011 (.036)
Population	1.16E-06 (9.42E-07)	-1.28E-06 (1.50E-06)	-1.88E-06 (2.18E-06)	-1.28E-06 (2.02E-06)	4.31E-08 (2.88E-06)	3.80E-06 (2.29E-06)	-1.7E-05** (5.45E-06)	2.11E-06 (5.74E-06)	-6.31E-06 (1.12E-05)
Population density	.001 (.001)	.002 (.002)	.007+ (.004)	-.002 (.003)	-.004 (.006)	-.005 (.003)	.006 (.008)	.007 (.006)	-.017 (.019)
Constant	6.459** (.325)	5.470** (.628)	5.030** (.725)	4.047** (.840)	4.596** (1.699)	2.727** (.955)	11.244** (2.262)	1.285 (2.256)	9.302* (3.492)
F statistic	1813.78**	515.91**	198.36**	477.37**	519.05**	37.21**	29.64**	95.52**	14.51**
R ²	.96	.87	.83	.77	.71	.59	.33	.40	.22

Notes: number of observations = 170. + $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$ (two-tailed tests). Standard errors (in parentheses) clustered by local government. Dummy variables for individual years not shown.

Table 3A. Local government consolidation and fiscal health (consolidated compared with nearly consolidated)

Variable	Grants per capita	Self-income ratio	Income per capita (2005-12)	Debt per capita	Reserves per capita
Consolidated (2009-12)	-.002 (.017)	.002 (.021)	-.107* (.054)	.185 (.138)	-.538** (.159)
Consolidating (2006-08)	.007 (.013)	-.012 (.014)	.093 (.064)	.137 (.116)	.130 (.108)
Post-reform period (2009-12)	.223** (.031)	-.012 (.014)	.034 (.107)	.250 (.167)	.436* (.217)
Deprivation	-.002 (.002)	.006** (.002)	.007 (.012)	.0002 (.010)	-.011 (.008)
Population	7.03E-07 (1.36E-06)	-3.32E-07 (1.20E-06)	6.54E-06 (7.20E-06)	5.50E-06 (4.70E-06)	-5.30E-06 (9.31E-06)
Population density	.003* (.001)	-.002 (.002)	-.017 (.014)	.006 (.007)	.008 (.014)
Constant	6.001** (.471)	3.752** (.345)	5.906* (2.220)	-.279 (2.046)	5.073 (3.087)
F statistic	833.27**	102.85**	30.21**	96.76**	13.79**
R ²	.93	.70	.41	.77	.36

Notes: number of observations = 170. + $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$ (two-tailed tests). Standard errors (in parentheses) clustered by local government. All dependent variables log-transformed. Dummy variables for individual years not shown.

Appendix B.

Table 1B. Local government consolidation and total expenditure per capita (matching estimator)

Matching variables	Population only	Population + controls	Population + controls + education expenditure per cap
Consolidated (2009-12)	-.012 (.032)	-.006 (.022)	-.007 (.019)
Consolidating (2006-08)	.022 (.015)	.005 (.006)	.013 (.010)
Post-reform period (2009-12)	.239** (.046)	.250** (.032)	.213** (.030)
Deprivation	-.001 (.002)	-.001 (.002)	-.001 (.001)
Population	1.19E-06 (1.57E-06)	7.72E-07 (1.31E-06)	9.56E-07 (1.32E-06)
Population density	.001 (.001)	.001 (.002)	.001 (.001)
Constant	6.499** (.353)	6.807** (.277)	6.707** (.302)
N	120	130	140
R ²	.95	.96	.96

Notes: number of observations = + $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$ (two-tailed tests). Standard errors (in parentheses) clustered by local government. Dummy variables for individual years not shown.