UK Trades Unions, Collective Action and the Cost Disease

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Abstract

This paper looks at the financial resources of trade unions in the UK. The core argument is that trade unions are subject to 'cost disease' pressures such that costs rise long term above the general level of inflation. They have this property because of the difficulty in solving first and second order collective action problems. First order problems refer to the problems of initiating collective action and second order problems refer to the management of collective action organisations. Both UK aggregate and case study data – from one of the largest UK unions, Unite – are presented to illustrate the cost disease problem and to suggest options for its management. In conclusion, the wider implications of 'cost disease' pressures for unions are assessed.

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1. Introduction

Unions in the UK have faced long term decline in at least three senses. First, union membership has declined since the late 1970's. The mechanisms underlying this decline in membership have been well analysed using successive Workplace Employment Relations Surveys (WERS) (e.g. Brown et al, 2009). Second, the number of unions has declined, over a longer period, leading to a greater concentration of a reduced membership (Buchanan, 1981; Willman et al., 1993). The primary mechanism for the reduction in the number of unions has been merger and acquisition (termed 'transfer of engagements'; see Undy 2008). This mechanism is probably a proximate cause. Both economic models of industry maturity and sociological models of organisational ecology identify wider forces that imply a reduction in union numbers over time (Hannan and Freeman 1987; Geroski 2001). A third sense in which UK unions have declined is financial. Over a long period – we discuss the period since the early twentieth century below – financial resources have declined. Specifically, in the aggregate, income from members does not cover expenditure, which tends to rise in real terms, and unions must plug the gap with revenue from other sources to remain solvent.

This paper focuses on the third area, financial resources, and argues that the problem is not accidental or contingent, but arises because unions are part of a wider set of organisations that are subject to 'cost disease' pressures. We discuss and explain this proposition more fully in the next section, but the core characteristic of organisations subject to 'cost disease' pressures is that their real costs tend to rise in the long term. As the originator of the idea, Baumol (2012; 19) puts it; "the list of items whose real costs are rising remains constant, decade after decade". We try to show why trade unions fall into this set and the implications of this overall approach for the management of trade unions.

The central proposition in this paper is that an understanding of the dynamics of organisations subject to 'cost disease' pressures is central to the discussion of

the future of UK unions. The decline in financial strength of UK unions in the long term cannot be explained simply in terms of poor management or policy choices; rather, cost pressures are endemic to such service-based organisations.

The structure of the paper is as follows. Section 2 outlines the cost disease approach and explains why unions experience cost disease pressures. Section 3 presents aggregate data on union resources, both those on the balance sheet and those not, from the early twentieth century to 2017. It uses both existing literature and the analysis of new data to argue that cost disease symptoms are endemic. Section 4 shifts the unit of analysis from the aggregate to a specific organisation, the largest UK union, Unite, for the period since its formation in 2007; the purpose of this case study is to examine first and second-order collective action problems at the level of the organisation as part of the cost disease problem. Section 5 looks at the broader implications of the data. Section 6 assesses the theoretical and practical implications.

2. Unions and Cost Disease Pressures

In a series of papers (Baumol and Bowen, 1966; Baumol, 2012; Flanagan, 2012), Baumol and colleagues have analysed what they term the 'cost disease'. This affects several sectors of the economy that deliver personal services – the main examples they use are from health care, education and the performing arts – in which costs tend to rise consistently faster than inflation, because the labour input of service delivery is difficult to reduce. Baumol characterises these as 'stagnant sector services' (the stagnation referred to is in productivity growth) and contrasts them with 'progressive' sectors – the examples he uses are computers and electronics – in which technology leads to rapid increases in productivity, reduction in real unit costs and thus the price of goods.

The terminology of ‘disease’ and ‘stagnation’, though emotive, is not used by Baumol pejoratively. The sectors on which the approach has primarily focused – education, health, the arts – are regarded as critical for social welfare and cohesion; he argues that societies should devote increasing resource to such sectors and that to use the same performance measures as in the ‘progressive’ sector is a recipe for ‘public squalor’ (2012; 27).

Costs in the ‘stagnant’ sector do not in this approach rise primarily because of general inflation, or because of excessive wage demands in the ‘stagnant’ sector. The problem is rather relative productivity growth. Salaries in the ‘stagnant’ sector tend to rise at broadly the same rate as those in ‘progressive’ ones, but since the percentage of total costs represented by labour costs is falling rapidly in the latter, but maintained in the former, only the former suffer from the ‘cost’ disease. Baumol et al (2012) document the falling labour hours per unit in a number of manufacturing sectors internationally but comment that it takes the same amount of labour to deliver certain services today as it did decades ago. In the ‘stagnant’ sector, labour input is a prime indicator of quality and standardisation is hard. Although some organisations combine ‘stagnant’ and ‘progressive’ elements (he cites R&D and manufacturing respectively in computers), many organisations in the ‘stagnant’ sector are long term members of it and experience continually rising real unit costs. In the three sectors mentioned – health, education and performing arts – survival is only possible with subsidy (private or public) or by eliciting increasing contributions (monetary and non-monetary) from the consumer, since rising real costs naturally lead to falls in demand. Baumol’s argument is that ‘stagnant’ sectors will come to claim much higher percentages of consumer expenditure in future, while progressive sectors will, through continual productivity growth, claim less. Without consumer acceptance of this shift, these stagnant sectors will go into decline.

This is a counterintuitive approach to the analysis of sectors of the economy in that it argues that for some sectors cost signals quality, not necessarily

inefficiency. His simplest example assumes a two sector economy in which automobiles on the one hand and the performance of Mozart quartets on the other are the only productive activities. He posits an annual productivity improvement of 4% in the former and 0% in the latter. If the auto workers' pay correspondingly goes up by 4% as they share the benefits of improved productivity, and the Mozart players similarly goes up 4% to maintain relative living standards, then the cost of quartet performance must rise relative to that of automobiles. If consumers wish to continue hearing Mozart live, they will experience ever rising relative prices.

More generically, Baumol sees most manufacturing as 'progressive' in experiencing productivity growth through technological change and most (but not all) services as 'stagnant' and experiencing ever rising relative costs. So, in a more complex economy than above, services - both public and private - become increasingly expensive and products increasingly cheap. Baumol and his colleagues see this argument as justifying increasing, not decreasing, expenditure on such 'stagnant' services as education, health and the arts.

The approach makes a number of strong assumptions. Industrial relations scholars might baulk at the idea that automobile (and other manufacturing) workers unproblematically benefit in their pay from productivity improvements, for example. In addition, this approach does not make any clear distinction between costs and prices; the former are seen unambiguously to determine the latter. Many management scholars would take issue at this. However, it does point to the idea that we should judge sectors differently. Stagnant sectors should show real price increases as an indicator that quality is being maintained. Progressive sectors should show real price falls as technology is successfully applied.

One way of beginning a discussion of the relevance of the 'cost disease' model for trade unions is to follow Baumol and imagine a simple two sector economy, this time one consisting of automobile production and trade unions producing

collective action. Under the cost disease argument, the former would experience real price falls and the latter real price increases which are cost driven. The auto worker would find the price of her union membership rising relative to the price of her car. If the price of union membership did not increase in this way, this would be because quality had been allowed to drop, because the union sector was benefiting from subsidy or because the union member was herself providing part of the service. The union sector would seek to sustain the price of union membership, perhaps by indexing union fees to auto workers' earnings increases, and would seek a variety of forms of 'subsidy' for the cost of creating collective action. It would also seek to control the rate of increase in real costs. We argue below that there is evidence from the UK for all such actions. However, we turn first to the 'cost drivers' in the production of collective action.

Olson's (1965) classic approach to collective action is to treat it as problematic; his key insight is to argue that public goods may not be provided even where everyone would be better off through their provision, primarily because of the free rider problem. Both the public choice issues and the free rider problem have been dealt with from an economic perspective by Booth (1984; 1985). For Olson, particularly where numbers are large, collective action is unlikely in the absence of two conditions. The first condition is the presence of *selective incentives*, namely the provision of private goods dependent on membership to supplement the public benefits of collective action. The second condition is coercion or forms of constraint to encourage membership. For Olson, these two devices go some way to solving the first order collective action problem, which is essentially how to get employees to join and stay in unions.

Several authors (e.g. Elster, 1989; 26-42, Kelly, 1998) have noted the logical problem with this, namely that in order for the collective action organisation to come into existence it needs already to exist in order to enforce the necessary conditions. Enforcement of the conditions is costly, and these costs form part of the second order collective action problem, which is controlling the costs of

managing collective action organisations such that the costs are less than the sum of public and private benefits on offer. This second order problem is likely to be resolved, as Hirschman (1970) notes, under three conditions. First, where members' switching costs are high, higher costs of collective action will be borne. Second, where activists exist with different utility functions, costs are reduced; activists for Hirschman have a utility function in which the returns to collective action are not, as they are for ordinary members, financial returns minus costs of action but the *sum* of the two, since a positive value is put on activism itself. Third, where the benefits of collective action are experienced additionally by third parties (i.e. they have broader efficiency properties), the costs of collective action may be more widely spread.

We may relate these broad considerations about collective action to union behaviour. As Pencavel (1970) notes, unions provide three types of service to members. The first, collective representation, tends to generate public goods and thus does not solve the first order problem. Unions thus offer two other services (i.e. selective incentives), private benefits (for sickness or retirement, for example) and 'semi-collective' membership-dependent benefits such as representation in grievance or disciplinary processes; the delivery is to the individual member but it relies on a collective agreement. Unions also periodically resort to coercion (such as closed shop – compulsory membership - arrangements) or constraint (such as 'check off' where the employer deducts union subscriptions from salary) to solve first order problems. Falls in membership density under a collective agreement indicate failure to resolve a first order problem. Unions may try to counter this by augmenting the private goods through increased emphasis on benefits and representation to retain members, but this will tend to raise both costs, specifically expenditure per member, and subscriptions.

Second order collective action problems lead unions to raise member switching costs, perhaps by using seniority-related benefits. The use of activists, rather

than full time union officers, as representatives may substantially affect administrative costs, and unions may deliberately enhance representative structures to encourage activism specifically to reduce administrative costs (Fiorito et al, 1995; Willman, 2004); democracy may in fact be cheaper than oligarchy. Such activism is more likely where employers provide time off and facilities as subsidies for activists, and they are arguably more likely to do this where they see spill over benefits from collective action, such as employee voice (Gomez et al., 2010) or productivity improvements (Freeman and Medoff, 1984). Voice and the attendant efficiency improvements are, in Hirschman's terms, part of the efficiency gain from collective action.

Unions are thus a form of private service organisation, providing a range of member services based on collective action; like other types of organisation in the 'stagnant' sector, they provide public goods with a high labour content. Unions may have benefited from generic improvements in information technology but there have been no major changes specific to the sector. There are incentives to shift costs onto members and employers, the two primary sets of 'customers' of unions. We have, of course, no direct measures of productivity growth for UK unions[2], but there are a number of 'cost disease' behaviours in evidence.

- Many unions use indexation, both for subscriptions of members and salaries of staff (Willman et al, 1993). Members' subscriptions are indexed to either wages or prices and staff salaries are often pegged to some index or key point of members' salaries. This has two substantial benefits. The pegging of subscriptions and salaries avoids transactions costs manifest in debates at conferences over what members pay and what union officials get. Second, it operationalises an idea of fairness;

[2] Breda et al attempt a productivity measure using data on outputs (membership numbers and subscription income) and labour costs from US union locals (Breda et al., 2016). There are no published data on total labour inputs for UK unions with which to construct a similar measure.

members pay when the union raises their real income, and unions show, as employers, they are as fair as their negotiating counterparts. However, as we will show, these mechanisms more or less ensure the shortfall of subscription income over total costs. The price elasticity of demand for union membership is an important issue, since a relatively small increase in the 'wage share' of union subscriptions would reduce the second order collective action problem substantially; i.e. if members would pay more for collective action, cost pressures could turn into price rises.

- Expenditure issues are primarily dependent on the problem that the union is both a representative organisation and an employer, with fixed short term employment costs. One of the key insights of the cost disease literature is that in the key sectors, costs are controlled by getting consumers (parents, relatives, volunteers) to complete some service work for free. The operational definition of this in the union sector is member activism, and, other things equal, the greater the level of activism, the easier it is to alleviate the cost disease problems unions face. Activism in turn depends on the provision of facilities for union activity by employers.
- UK unions have little direct endowment from private sector donors or public funding. However, if they provide, as both Hirschman and Freeman and Medoff argue, efficiency gains for firms and wage premia for members, then there may be the prospect of generating resources from both to solve the cost disease.

Although the productivity data are elusive, the cost and resourcing data are not. There is a substantial literature analysing union finances in the UK over a long period from which we might derive a view of the extent to which unions are cost disease organisations. In the next section we turn to this literature. In addition, we update it.

3. UK Unions and the Cost Disease

(i) Existing Literature

Union financial measures are a key indicator of the viability of collective action. This much was understood by the Webbs (1907; 162-283) who recognised the centrality of financial status and arrangements to secure 'permanent organisation' for the so-called 'new model' unions. However, understanding the role of such measures and arrangements has been the focus of just a few studies in the 20th and 21st centuries in the UK.

These studies have used two distinct data sets. The first, and most important, is the public record of statutory financial returns required from each trade union (the 'AR21'). This series runs, with some minor changes and interruptions, from 1871. It requires a true and fair account of income, expenditure and assets, itemised by service and category. It includes a balance sheet and it requires unions to report, but not to standardise, their financial structures. Since 1974, it has been accompanied by a set of accounting guidelines but in practice variance remains (for example in asset valuation) throughout the period up to the acceptance of Financial Reporting Standards in the early part of this century[3].

The second data set is the Workplace Employment Relations Survey (WERS), a survey of workplaces conducted in Britain six times since 1980 covering all sectors except agriculture and mining. We use data collected from workplace managers responsible for employment relations for the five surveys conducted

[3] For a fuller account of the guidelines, see Willman et al 1993; 217-9. For a description of the relevant parts of FRS, see Section 4 below.

between 1984 and 2011. Survey-weighted, the analyses are representative of workplaces in Britain with 25 or more employees.[4]

The first major studies used the AR21 data set. Roberts (1956) documented changes in aggregate income, expenditure and assets for the period 1936-50. He found substantial shifts in financial structure across the period. Unions found it difficult to raise subscriptions to keep pace with wages, prices or administrative expenditures per capita. Investment income filled the gap between subscription income and total expenditure; this income was, at that time, primarily yields from government bonds. Individual, friendly-society benefits declined as a proportion of total expenditure. Roberts argues, in effect, that the then newly-established welfare state (from the late 1940's) took over the primary role of benefit provider to all employees. Union benefits thus ceased to be a private good helping to solve the first order problem, and the resolution of second order problems of union operation absorbed more resources than revenue from membership could generate. Roberts closes his analysis with an expression of concern about the viability of the dominant union financial model in which investment income (either from asset returns or sales) balances the books by filling the gap between income and expenditure.

Latta (1972) uses the same public dataset to examine the period 1960-70. One of his major concerns is a mismatch in resources between (then) rich, manual unions with stable membership on the one hand and rapidly expanding but insolvent white collar unions on the other; the union movement's resources are seen to be in the wrong place. However, he notes widespread loss of assets and a general tendency for total expenditure to exceed total income. His conclusion is that there had been 'a marked decline from the period surveyed by Roberts' (1972; 409).

[4] Although recent surveys collect data for all but the smallest workplaces with fewer than five employees, we focus on those with 25 or more employees because the first surveys in the series were confined to these workplaces.

Again, beginning with the same dataset, Willman et al (1993) examined the entire period from 1950-1989 in order to complete the picture. The period embraced three discrete patterns of membership change; steady growth to 1965, very rapid increase from 1965-1979 and then sharp contraction from 1979 to 1989. These trends were not highly correlated with financial changes. Real total income tracked real total expenditure for the whole period, with a margin of approximately 10%. Benefit expenditure continued to shrink. However, membership growth in the period 1965-1979 was associated with a halving of the value of union funds in real terms. This was a period of high inflation, and it may be that union assets were not inflation proof, or that the costs of membership acquisition exceeded the financial returns. However, from 1965 onwards, total subscription income from members averaged approximately 90% of total expenditure. Over the same period, the number of 'years of expenditure' held by unions in funds fell from 3.6 years to 1.2 years (Willman et al 1993; 7-19).
One interpretation of these trends is as follows. Income from members is not sufficient to resource a full solution to the second order collective action problem, evidenced by total expenditure. The gap is covered by selling assets. In the aggregate, unions did not over this period increase the ratio of subscriptions to average earnings; in fact, it fell from 0.42% of pre-tax average earnings in 1950 to 0.31% in 1980, a period in which private goods – benefits – also declined as a proportion of total expenditure. Paradoxically, the 1980's, a troubled decade for UK unions in many respects including membership loss, showed an increase in this subscription ratio (to 0.37% at the end of the decade) and a substantial increase in returns on assets as unions moved resources from bonds to equities and property (Willman et al.1993; 15).

A final study, Willman and Bryson (2009), extended this work in two ways. First, it extended the study of this dataset to 2004. In this period, which is also one of membership contraction (from 1990 to 1997) then stagnation, solvency margins remained slim (3%), but income from members increased faster than average

earnings and the value of reserves increased faster than prices (though slower than stock market indices). However, expenditure rose fastest, such that by 2004 the union movement had a (then) historic low of 1.06 years of expenditure in reserves.

The second element of this 2009 study is to attempt to assess unions' 'off balance sheet' resources. The dataset on statutory returns covers the balance sheet of the union as a formal reporting organisation. It does not consider the 'Hirschman' elements of activist support for collective action or employer subsidy of union activity. For the period 1984-2004, Willman and Bryson use the WERS workplace data to attempt to assess trends in 'off balance sheet' resource for union activity. They construct a three item index – check off of union subscriptions from salary, management recommendation of union membership, and the presence at the workplace of a union representative. This index declines by about 20% over the period 1984-2004. It should be noted that, given the decline in union density under collective agreements over this period, this may actually represent an increase in off balance sheet resource *per member*. However, observing that off balance sheet resource declines over the period by a greater proportion than on balance sheet resource, they conclude that this reduction in hidden resources for collective action is in fact 'a major pressure on union balance sheets' (Willman and Bryson, 2009;42).

In summary, then, the long series of AR21 data reveal major endemic financial problems for British unions in solving first and second order collective action problems, at least until 2004. Union members pay a very small proportion of earnings as subscriptions and receive limited private goods in return. Coercion, in the form of closed shop arrangements, was never widespread and declined rapidly in the late 20th century until it became legally unenforceable in the early 1990s (Millward et al, 2000; 150). UK union members do not have high costs of shifting out of union membership; the wage premium is not large in the UK (Blanchflower and Bryson, 2004) and is in many cases a public good within

unionised workplaces (Forth and Millward, 2002). Activism and employer support appear to be in decline. The outcome variables are a reduction in union funds in the aggregate generated by the need to subsidise current activity from reserves.

(ii) The recent picture

This section of the paper brings the picture up to date by using both the statutory returns and the WERS dataset; the former extends to the financial year 2016/17 whilst the latter covers the period to 2011. The core elements of the story remain largely unchanged, but there are some additional elements, not least to do with trends in average earnings and asset returns across the financial crisis.

Figures 1 and 2 about here

Figure 1 contains a membership concentration story[5]. Over the period 1999/2000 to 2016/2017, the number of unions has fallen by 36 percent whilst the number of members has fallen by 13 per cent, leading to a steady increase in the average size of trade unions. The primary mechanism in the reduction in reporting unions is merger or transfer of engagements, so the effectiveness of post-merger integration becomes an important ingredient in the solution of the second order collective action problem. A second issue is that, because the size distribution of unions is increasingly skewed, the aggregate picture becomes much more susceptible to the influence of events in the largest unions. We shall return to both points below.

[5] In the figures that follow, we exclude returns from two organisations of medical employees, the British Medical Association and the Royal College of Nursing. These are sizeable membership organisations, but they are also professional bodies with professional training businesses that financially dwarf their representational activities. BMA includes this income in its returns, RCN does not. The latter organisation has not historically regarded its fixed assets as relevant to its returns and thus, in all but the most recent years, has returned an asset value of £0.

Figures 2 to 4 focus on percentage changes with 1999 as the base year. Figure 2 shows continued low income growth and low solvency. The main change from previous studies is the increased expenditure volatility, with spikes in 2005, 2008, 2011, 2014 and 2016. The 2008 spike is partly a function of expenditure increases across unions with the fallout from the financial crisis, but in many of the other years, specific second-order problems emerge. We discuss these more fully below; the short version is that they emerge from problems experienced in funding liabilities under defined benefit pension arrangements for union employees.

Figures 3 and 4 about here

Figure 3 shows union expenditure and income, in *per capita* terms compared to movements in prices and average earnings. Once more we see a volatile expenditure curve that is generally higher than the *per capita* income figure. Expenditure increases in real terms, i.e. faster than consumer price inflation (CPI), throughout, typical of cost-disease pressures. Since the 2008 crash, unions have managed to increase income from members faster than average earnings have increased; the real price of collective action has risen.

Figure 4 focuses on union funds and expenditure, also showing the ratio of the two (the 'acid-test' ratio). Despite the discontinuity in 2014/15 caused by a change in financial reporting standards, the series shows a steady worsening of the position since the turn of the century, with the union movement having less than one year's expenditure in reserve in most years. [6]

We also have WERS data on the off balance sheet resources, slightly different in format from the earlier index in Willman and Bryson (2009) and covering the

[6] The discontinuity arises because a new financial reporting standard (FRS102) changed the calculation of net assets, inflating the figures on net assets compared to earlier years (which used FRS17). For a fuller account, see Certification Officer Annual Report 2016-2017, p29.

additional period 2004-11; these are presented in Table 1. The first row shows the decline in union recognition among workplaces with at least 25 employees. The decline is on-going but has slowed markedly since the late 1990s. The remainder of the table presents trends in off-balance sheet resources among those workplaces with recognized trade unions. Conditional on recognition, unions' off-balance sheet resources fell sharply through the late 80s and 90s, but have since been roughly stable in the period 2004-11. Putting this alongside the picture of a general continued deterioration in on balance sheet resources, it appears that, although it is impossible to assess the absolute size of each resource set, off balance sheet resources may be relatively more important to union functioning at the end of the period compared to 2004. Put another way, any threats to off balance sheet resources are likely to be more serious at the end of the period.

Table 1 about here

Overall, then, the 'business model' for collective action does not differ substantially in 2014 from that identified by Roberts for a much earlier period. Unions still do not cover the costs of servicing members from membership income. They rely on other income to fill this gap, and this income is normally from investment yields or disposals. Where investment yields are good, this model is more robust, and even more so where good investment yields and growth in real earnings coincide. Thus, perhaps ironically, the 1980's, with rises in both asset prices and earnings but large falls in union membership, was rather better for unions in resource terms than the 1970's, which saw massive membership growth but high inflation exerting downward pressure on real earnings and with union asset returns poor across a wide range of asset classes. The contrast between these two decades in financial terms indicates the importance of exogenous influences on union resources. A paradox for UK unions is that the circumstances that drive membership increases and thus help

with first order problems also create substantial second order collective action problems for the organisations concerned. A major issue is price inflation. In the 1970's price inflation was an ingredient in generating growth in white collar union numbers (Bain 1970), but it also outstripped the returns on union investments (and indeed asset prices overall) and propelled a massive increase in the wage bills of many unions (Willman et al 1993).

In short, unions show the decades-long rise in real costs that Baumol associates with stagnant cost disease sectors. The importance of off-balance sheet resources indicates also a characteristic cost-disease attempt to shift costs to consumers; members become representatives and the employer funds facilities for this. In the UK, with its traditional 'voluntaristic' industrial relations system (Kahn-Freund, 1972) there has been little direct state subsidy. However, as we discuss below, this is rather different from saying that government has no influence over the extent of the cost disease in UK unions.

A major departure from the typical cost disease story relates to the price of union activity, measured by the percentage of average earnings taken as union subscriptions. This did not increase across the twentieth century; in fact it was lower at the end of the twentieth century than in the pre-World War 2 period studied by Roberts (Willman et al 1993). We made the point above that the cost disease argument makes simple assumptions about the relationship between cost and price. It may be that some organisations that experience the cost disease can substantially raise their prices to adapt (e.g. private health and education), whereas others cannot; we return to this below.

This history illustrates certain endemic problems in the management of union organisations. In order better to understand some of these, we shift the unit of analysis from the aggregate to the specific organisation, with a case study of the UK's largest union across the last decade.

4. Unite; the union – A Case Study of Cost Disease Pressures

Unite was formed by merger or, more accurately, by a series of mergers and transfers of engagements of members. In 2001, two large, and mainly private sector unions Manufacturing Science and Finance (MSF) and the Amalgamated Electrical and Engineering Union (AEEU), merged to form AMICUS (not an acronym). In 2004, AMICUS absorbed two industrial unions, GPMU (printing) and UNIFi (finance); both of these were themselves the product of prior mergers. In 2007, Unite was formed when AMICUS itself merged with the largest general union, the Transport and General Workers' Union (TGWU). The result was formation of the then largest union in the statutory returns, accounting for over 25% of total union membership, and a substantially higher proportion of TUC membership in 2016. It runs both administratively and on a representational basis with a matrix structure, the two axes of which are geographical region and industry group.

As noted above, merger and transfer of engagements are the primary mechanisms driving membership concentration in UK unions. The motives for serial merging are complex but the trend is long term. Some mergers appear to be the result of financial fragility of one or more party, others are attempts to avoid or mitigate inter-union competition (Undy, 2008). Few have generated robust economies of scale in membership servicing that might alleviate second-order problems (Aston 1987; Willman 1996), and one reason for this may be that many merger agreements tend to protect incumbent rights both to services to members on the one hand and to employment status for union officers on the other.

The on balance sheet performance of Unite is shown in Table 2, which uses Certification Office data. Since formation, membership has fallen by 34%, but subscription income *per member* has increased by 150% in nominal terms. Total income has increased by 63% and total expenditure by 74%. These figures are

consistent with cost disease pressures; expenditure rises require increased prices to a smaller number of members. There are substantial expenditure spikes during the period, particularly just after merger. For the period 2008-13, Unite had solvency <1, and this has affected the union's funds. Net worth declined to only 17% of its 2007 level by 2012, before recovering the following year. However, in 2013, the acid test ratio for the country's largest union stood at only 0.23, i.e. approximately 4 months of expenditure in reserve, and by no means all of this liquid. By the end of 2014, this figure had recovered to 0.94, i.e. approximately one year of expenditure in reserve. Because of changes to accounting standards, the later figures are not comparable.

Table 2 about here

That 66% of the original membership total would come to pay over 160% of the original income from members indicates robust willingness to pay for the union's services and by 2015 membership income was, unusually for a British union at the time, covering total expenditure. However, the expenditure spikes in Table 2 (which incidentally mirror those in the aggregate in Figure 2 above) led to a considerable depletion in union funds.

What might cause an expenditure spike for a union? Administrative expenditure dwarfs benefit expenditure and the largest expenditure items tend to be recurrent and relatively stable. Normally salaries and expenses of union staff are by far the largest item (about 48% for Unite at formation), followed by subsidies to branches (about 10% annually in Unite) then occupancy and office costs and property repairs. Unpredictable or non–recurrent items would normally relate to campaigns or disputes, involving legal and balloting costs, strike pay or additional conference expenses. On several measures, Unite has performed well in managing down fixed costs. Table 3 shows staff costs as a percentage of total revenue in the period since the merger. These have fallen by 9% in a decade, as the union has sought to integrate and consolidate its activities since the merger.

However, this effort has been mitigated by other labour –related costs that show greater volatility.

In this case, Unite was financially badly hit by liabilities arising from its responsibility as an *employer*, specifically relating to actuarial losses on the final salary pension schemes covering union officials and staff. Over the period covered by Table 3 and in particular just after the merger, large losses of this sort were set against expenditure. Across the entire period, such losses were over £175 million net, set against the nominal funds loss in Table 2 of approximately £120 million to 2014-5.

These liabilities are not unique to Unite, or indeed even to unions as a whole. Pension fund deficits on final salary schemes, and the accounting rules for dealing with them, cover all employing organisations with funded schemes. However, there are particular vulnerabilities for unions. First, for financially fragile organisations, the absolute amounts involved can be very high, as the Unite case shows. Second, most unions have provided generous schemes to their own staff, mirroring their concern for many years that employers with whom they bargain should provide generous pensions. The third point is a matter of timing. Although it is difficult to get accurate figures, most current unions expanded their employment of officials in the 1970's and early 1980s, a time of widespread adoption of final salary schemes in the UK. From a cohort perspective the resultant liabilities are likely to peak in the current decade and the next, as staff retire and the contribution base shrinks.

The AR21 returns allow us to examine this phenomenon for Unite in more detail. Each return from a union must contain an FRS17 disclosure (subsequently FRS102). FRS17 was the Accounting Standard governing disclosure of the financial status of UK pension schemes, both defined benefit and defined

contribution; increasingly, defined benefit schemes have proved difficult to fund. Each year, unions must disclose details of the assets and liabilities of their pension funds in the accounting period that the liabilities arise, and at the market price of the assets. Put simply, if the scheme's assets decrease, or the liabilities increase, this must show up as a charge in the income and expenditure statement for the union in the statutory return and the union may be required to indicate provisions for any shortfall in the scheme.

Unite at merger inherited five final salary pension schemes covering staff inherited from unions that had transferred members, assets and liabilities into the merged entity. Four of these schemes were in deficit at the merger. It also inherited some unfunded liabilities (i.e. commitments to pay pensions without any assets to back them).

Table 3 shows the data series. The overall pension liability increases rapidly between 2007 and 2009, as the value of the assets held by the five funds fell during the crash. They remained high while assets, particularly equities, recovered to 2013, indicating the increase in liabilities as the union sought to rationalise its employment base post-merger; many of these costs fell on the pension scheme. In 2012, the union consolidated its pension schemes from 5 to 2, presumably to generate administrative economies of scale, and Policy Conference that year passed a motion[7] requiring control over the level of severance payments to staff. Pension deficits then began to fall, but remained substantial in 2016.

Pensions are deferred pay, i.e. a staff cost. Total pension liabilities do not show up in the expenditure statement, but the calculation of actuarial liabilities does. In Unite, these are charges on the general fund which produce the expenditure spikes in Table 2 (and, incidentally, in the aggregate expenditure data of Figures 2 and 3), and contribute also to the falls in the year end value of funds.

[7] Policy Conference decisions, page 57. Unite website, initially accessed March 2016

The key points we would draw from this are as follows.

1. Unite shows several characteristics of an organisation subject to cost disease pressures, with real expenditure items difficult to control. As a result, Unite has put up prices. Table 2 shows income from members rising 63% in nominal terms while membership contracted by 34%. Given the fall in funds we described above, the union appears to have found the 'traditional' Roberts solution of covering revenue shortfalls with asset income not feasible.
2. Employment costs tend to turn into fixed costs for such organisations. In particular, the incidence of defined benefit pensions schemes and their liabilities, combined with mark to market accounting, as described above in FRS17, mean that union assets increasingly have to be used to fund pension fund deficits not regular items of current expenditure.
3. In the twenty-first century, this has caused unusual expenditure spikes for Unite which have been sufficiently large to affect the aggregate picture for UK unions. The cost disease model implies relentless creep of real costs, but here regulation of accounting standards has a more episodic effect.
4. Real revenue improvements are possible post-merger. Unite has managed nominal revenues up and employment costs down, but overall expenditure has proved difficult to control.

In summary, Baumol's cost disease approach explains Unite's financial performance in several respects. The union has coped almost heroically with the legacy effects of pension fund liabilities built up by its constituent elements mostly before its formation. Its staff cost percentage decrease is evidence of a successful post-merger integration process. But union prices to members have had to rise substantially as the expenditure base continues to rise while

membership falls. Although the change to accounting standards and mergers distort the series, its reserves have shrunk substantially.

5. Discussion

In this paper, we have presented an analysis of the resource position facing UK unions in order to discuss strategic issues and options. In section 2, we argued that these resource issues could best be understood by seeing unions as subject to endemic cost disease pressures. In section 3, we used existing literature to argue that there are structural flaws in the collective action model used by UK unions in the aggregate. This model has, since the period of Roberts' analysis, relied on taking a broadly constant proportion of real earnings as income from members, and providing private as well as public goods to encourage membership growth. However, private goods are representative based, rather than benefits based, and depend on the solution to the second order collective action problem of how to provide the expected returns to members. Since 2008, both the aggregate picture and the case study of Unite show growth in income from members in excess of wage growth[8]

Empirically, the cost problem is that, because expenditure routinely exceeds income from members and rises in real terms, other income must secure solvency by filling the gap. Other income has been from investments and assets and the most pervasive story of the entire period since 1950 has been the erosion of the asset base in relation to expenditure. The costs of collective action fall to an unquantifiable degree on union balance sheets on the one hand and on

[8] This is true even when Unite data are extracted from the aggregate picture.

members and their employees on the other. In theory, a union could exist entirely ‘on balance sheet’, in which case its costs would be substantial, or entirely ‘off balance sheet’, in which case employer subsidy and membership activity would support a very small union superstructure.

There are empirical examples in UK close to both conditions. In the 1980’s the Inland Revenue Staff Federation (IRSF) decided to base its collective action strategy almost entirely on paid officials because of the opportunity costs of union activism for members on high pay. It funded this strategy both by raising subscriptions and by special levies on members to fund disputes (Willman et al, 1993; 101-21). At the other extreme, the shop floor bargaining practices in engineering described in the research papers for the Donovan Commission in the 1960’s depict an industrial relations system operating almost without reference to a formal union structure. Throughout the 1970’s and 1980’s, the financial size of the main engineering union (then AUEW) was a fraction of the that of other unions with similar membership, since most of its activity was funded off balance sheet (Willman et al 1993; 154-70) So, there is substantial unobserved heterogeneity underneath the long run aggregate data but, in the aggregate, the current UK union business model can only work where union assets generate a continuous and sustainable revenue stream to subsidise collective action.

Section 3 also presented data that indicate union reserves are, in the second decade of the 21st century, so low that the risks associated with this model are high. Assets are historically low against real increases in expenditure, and cost pressures have turned into price increases. This has been a period of relatively low wage increases and may be anomalous, but from the Unite case, we can see the price elasticity of union membership being tested.

Unite has during its short life managed its labour costs down as a percentage of revenue. During much of the period since 2007, real wage growth has been low, affecting both union employee and union member earnings. However, these

efforts have been undermined by the legacy effects of pension liabilities and charges, which is to some extent exogenous; i.e. the pension liability impact is profoundly affected by the FRS17 reporting regulation requiring actuarial losses to be charged to expenditure. Unite was perhaps unfortunate in the timing; this set of regulations only became mandatory around the time of the merger. Without mark-to market accounting, the picture for Unite and for UK unions in the aggregate would be very different.

We would point to the interaction between endogenous and exogenous factors in union financial performance. By 'endogenous' we mean primarily the effectiveness of cost management strategies within unions; all experience cost disease pressures but some manage costs and revenues better than others. By 'exogenous' we refer to the factors over which the union has little or no control; for example the high tide of asset returns in the early 21st century benefitted most unions, and the crash reversed much of this gain. Government regulation of unions may impose substantial costs, and unions will find it difficult to raise real income levels above expenditure when members' wages are flat in real terms.

Endogenous and exogenous factors may interact, and not only for Unite. Many unions in the UK benefited in the same period from government funding under the 'Union Modernisation Fund' designed to improve 'organisational effectiveness' – often focused on costs – by introducing management techniques (Stuart et al. 2010). For example, several unions introduced 'balanced scorecard' performance measurement approaches[9]. However, other government actions, such as the passing of the 2016 Trade Union Act, tend to raise union costs. Many UK unions opposed the Act mainly as an interference with rights to strike and union democracy, but measures in the Act to regulate balloting frequency and majorities also have a substantial influence on costs. For example, in the period before the Act, Unite spent approximately £1 million annually on non-strike

[9] The first named author was involved in doing so under this scheme in a large retail union, the Union of Shop, Distributive and Allied Workers.

(i.e. election) ballots. In addition items discussed during the Act's passage both to remove deduction of members' subscription from salary and to regulate union facilities in the public sector would have a substantial impact on the aggregate cost picture.

6. Conclusion

The key argument of this paper is that UK unions are, in Baumol's terminology, a type of 'stagnant' sector service, characterised by high levels of labour input, low productivity growth and remorseless cost disease pressures. We conclude by looking through this lens at the options available to unions to improve their financial position.

In the other sectors characterised by such economic features, such as health, education and the performing arts, the solutions to organisational survival take at least two forms; first, convincing customers to devote a greater proportion of their total expenditure to the service in question and, second, securing state funding or private endowment to subsidise operational activities; they are not mutually exclusive. They may not seem at first sight relevant to unions, but we suggest that they are.

For UK unions, as we noted, addressing the first option means exploring the price elasticity of demand for union membership. Since Roberts' early analysis, UK unions have taken a very small (< 1.0%) fraction of UK average earnings as subscription income and, even within this narrow 1% band, there is no clear sign of increase. Currently (2017 data), the percentage is less than 0.5%. An argument has been made that inter-union competition has caused a race to the bottom in terms of union membership pricing, but as the number of unions

diminishes and membership concentration increases the competitive pressures between unions must diminish and the possibilities of price coordination increase. British unions may need to test out members' willingness to pay higher subscriptions (as a percentage of earnings) than has historically been the case. However, this raises the prospect of higher non-membership for employees and the development of forms of non-union voice by employers; both are rising in the UK (Bryson and Gomez, 2005; Willman et al, 2014).

The second option, securing state or private subsidy, may also seem less relevant for unions than it is, say, for performing arts. Nevertheless, the key insight here is that the behaviour of public actors (government, specifically legislators) and private ones (specifically unionised employers) are sources of subsidy for collective action. The content of employment and industrial relations legislation has a substantial impact not only on union rights but on union costs. Unions have always sought legislation to enhance union rights but perhaps have not focused as much on the second order collective action effects of legislation. On the other hand, the contribution of employers through provision (or concession) of union facilities has historically been very important to union viability in financial terms. The evidence available is that it has been in decline for some time, and that this has increased the second order problems on union balance sheets.

Further comparative research on union business models may take this story further. Unions in both USA and Germany, for example, pursue the first approach by taking a higher percentage of members' earnings as subscriptions. In France, revenue from members is less important compared to government payments to unions for certain activities. These considerations are important but go beyond the scope of this paper.

The third and most radical solution to the cost disease situation is to cease to be a stagnant sector service. To illustrate, consider Baumol's favourite example -

the cost of hearing a Mozart quartet. This may remain high to experience as live music. But the cost for most who listen in the twenty first century is asymptotic to zero when the music is streamed or downloaded. Digitised access to health and education have been held to offer similar cost disease solutions. In the sphere of collective action, there are examples of the use of digital technologies to reduce collective action costs in both UK and USA (Bryson et al 2010; Economist; 2018). In many cases, the most prominent in the UK being the Independent Workers' Union of Great Britain, these are associated with attempts at collective organisation in the gig economy.

The key point here is that these attempts often have different revenue sources (e.g. crowdfunding not subscription), different cost bases (apps not labour) and asset structures (almost none). They thus avoid the cost disease problems that currently affect UK unions. A key strategic issue, which must remain speculation for now, is whether existing unions could adapt through radical organisational change, or whether new entrant organisations will supplant them.

In summary, then, the cost disease framework implies strategic options for union financial revitalisation centred on the resolution of a century-old problem for UK unions. Roberts first identified that asset income was central to union survival. We have argued that this arose from the central cost disease problem. Currently, asset reserves are at a historical low. The cost disease problem will need urgently to be addressed and the strategic options are clear.

References

Aston, B. (1987) “Trade union mergers in Britain, 1950-82”, unpublished PhD thesis, London School of Economics.

Baumol, W.J. (2012) *The Cost Disease; Why Computers get Cheaper and Health Care Doesn’t,* New Haven, Yale University Press.

Baumol, W.J. and Bowen, W.G. (1966) *Performing Arts; The Economic Dilemma,* Cambridge, MIT Press

Bain, G.S (1970) *The Growth of White Collar Unionism,* Oxford University Press.

Blanchflower, D. and Bryson, A. (2004) “What effects do unions have on wages now?” *Journal of Labor Research,* 25, 3, p383-414.

Booth, A. (1984) “A public choice model of trade union behaviour and membership” *Economic Journal,* 94, 4, p883-96.

Booth, A. (1985) “The free rider problem and a social action theory of trade union membership” *Quarterly Journal of Economics,* 99, p253-61.

Bryson, A.,Gomez,R. and Willman, P.(2010) “Online Social Networking and Trade Union Membership” *Labor History* 51, 1. p41-53

Breda, A., Bryson, A. and Forth, J. (2016) “Competition and Productivity; The case of union locals” working paper, University College London.

Brown, W.B., Bryson, A., Forth, J. and Whitfield, K. (eds) (2009) *The Evolution of the Modern Workplace,* Cambridge, Cambridge University Press.

Bryson, A. and Gomez, R. (2005) “Why have workers stopped joining unions? Accounting for the rise in never membership in Britain” *British Journal of Industrial Relations,* 43, 1, p67-82

Bryson, Willman, Gomez, Kretschmer (2014)“The Comparative Advantage of Non-Union Voice in Britain, 1980-2004”, Industrial Relations, Vol 52 no.1 2013, p26-52.

Buchanan, R. (1981) “Union Concentration and the Largest Unions” *British Journal of Industrial Relations*, 19 2, pp232-7.

Certification Officer. *Annual Report of the Certification Officer.* London, HMSO, various years.

Economist (2018) *Briefing: Technology may help to revise organized labour* 15th November Issue.

Elster, J. (1989) *The Cement of Society.* Cambridge, Cambridge University Press.

Fiorito, J., P. Jarley, and J. T. Delaney (1995) "National Union Effectiveness in Organizing; Measures and Influences*." Industrial and Labor Relations Review* Vol. 48 No. 3 pp 613-635.

Flanagan, R. (2012) *The Perilous Life of Symphony Orchestras,* New Haven, Yale U.P.

Forth J. and Millward N. (2002) "Union effects on pay levels in Britain", *Labour Economics*, Vol. 9, No. 4: pp.547-562.

Freeman, R. and J. Medoff (1984); *What Do Unions Do?,* New York: Basic Books

Geroski, P. (2001) "Explaining the niche overlaps between organisational ecology and industrial economics" *Industrial and Corporate Change* 10, 2, p507-40

Gomez, R., A. Bryson and P. Willman (2010) "Voice Transformation: The Shift from Union to Non-Union Voice in Britain" in *Oxford Handbook of Participation in Organisations* , (ed) Wilkinson et al., Oxford University Press, 2010

Hannan, M. T. and Freeman, J. (1987) "The ecology of organisational founding; American labor unions 1836-1985 *American Journal of Sociology,* 92, 4, p910-43

Hirschman, A. (1970) *Exit, Voice and Loyalty.* Cambridge, Harvard University Press

Kahn-Freund, O (1972) *Labour and the Law,* Oxford, Blackwell.

Kelly, J. (1998) *Rethinking Industrial Relations,* London, Routledge.

Latta, G. (1972) "Trade Union Finances", *British Journal of Industrial Relations,* 10 2.

Millward, N., Bryson, A., and Forth, J. (2000) *All Change at Work,* Routledge, London.

Olson, M. (1965) *The Logic of Collective Action; Public Goods and the Theory of Groups,* Cambridge, Harvard University Press.

Pencavel, J. 1971. "The Demand for Union Services; An Exercise" *Industrial and Labor Relations Review,* 24, 2, pp180-190.

Roberts, B. C. 1956. *Trade Union Government and Administration* London: Bell and Sons.

Stuart, M., Lucio, M, Tomlinson, J. and Perret, R. (2010) *Union Modernisation Fund; Final Evaluation Report,* Employment Relations Research Series, WP 111 University of Leeds, CERIC.

Undy, R. (2008) *Trade Union Merger Strategies*, Oxford University Press

Webb, S. and Webb, B. (1907.) *The History of Trade Unionism.* London: Longman Green and Co.

Willman, P. (1996) "Merger propensity and merger outcomes among UK unions, 1986-95." *Industrial Relations Journal*, Vol. 27, No, 4 pp. 331-9

Willman, P. (2004) "Structuring unions; the administrative rationality of collective action." In John Kelly and Paul Willman, eds. *Union Organization and Activity.* London: Routledge, p. 73-89.

Willman, P. and A. Bryson (2009), "Accounting for Collective Action; Resource Acquisition and Mobilisation in UK Unions*", Advances in Industrial Relations*, 16, p23-50.

Willman, P., T. J. Morris and B. Aston. (1993) *Union Business; Trade Union Organization and Financial Reform in the Thatcher Years*. Cambridge: Cambridge University Press, 1993.

Table 1: The Distribution of Off-balance Sheet Support for Unions, 1984-2011

	1984	1990	1998	2004	2011
Any recognized unions	66	53	41	38	36
Where unions are recognized:					
Check-off	80	86	75	75	80
Managers require or strongly recommend union membership	58	42	22	..	..
Managers in favour of union membership	..	..	62	65	63
Any on-site union representatives	83	72	69	62	63
Index 1 (mean)	2.20	2.02	1.63	..	..
Index 2 (mean)	..	..	2.07	2.03	2.06

Bases: row 1: all establishments with 25 or more employees; row 2: those establishments with 25 or more employees that recognize at least one trade union.
Source: Workplace Employment Relations Survey (WERS) series.
Note: Figures are cell percentages, with means presented in the final rows. Each index is computed as the mean of the three binary (0,1) variables shown above it in the table, computed only among workplaces where unions are recognized. The question asking whether 'managers require or strongly recommend union membership' was discontinued after the 1998 WERS, following the introduction of a new question asking whether 'managers are in favour of union membership'.

Table 2: Unite Annual Returns, 2007/8-2016/17

Year	Members	Income from members (£000s)	Total income (£000s)	Total expenditure (£000s)	Year end funds (£000s)	Income from members, per member (£)	Solvency (income/ expenditure)	Acid test ratio (funds/ expenditure)
2007/8	1952226	102341	112499	100908	240580	52	1.11	2.38
2008/9	1635483	149053	151298	213319	175559	91	0.71	0.82
2009/10	1572995	146689	151834	226976	103417	93	0.67	0.46
2010/11	1515206	152489	163000	187758	78659	101	0.87	0.42
2011/12	1510026	143323	156880	174470	61069	95	0.90	0.35
2012/3	1424303	151302	164391	183516	41944	106	0.90	0.23
2013/4	1405071	151136	167216	131149	78011	108	1.28	0.59
2014/5	1405838	158633	172003	129945	122474	113	1.32	0.94
2015/6	1382126	163381	176652	132476	196644*	118	1.33	1.48
2016/7**	1282671	166620	183333	175367	205110	130	1.05	1.17
% change, 2007-2016	***-34%***	***+63%***	***+63%***	***+74%***	***-15%***	***+150%***		

Source; Certification Office Returns

Note: 1. Unite returns are for the years ending 31 December in the first mentioned year. All values are nominal.

*an accounting change inflates year end funds from 2015/6 for all reporting unions

**On 1/1/17 Unite absorbed a construction union, UCATT, with net assets of approximately £1.6 million, including substantial pension liabilities but enabling several property sales.

Table 3

Unite Labour Cost and Pension Data, 2007-17

Year	Staff costs* (% of revenue)	Actuarial Loss** (£000)	Liabilities*** (£000)
2007	52.9	(3,839)	18,583
2008	52.1	43,642	52,099
2009	55.0	90,573	137,325
2010	49.1	(7,099)	103,344
2011	45.9	21,669	121,288
2012^	44.6	27,809	144,010
2013	44.3	(11,284)	118,002
2014	43.8	(8,447)	92,214
2015	42.9	(6,539)	79,551
2016	39.8	33,096	104,915
2017	43.9		5,241

Source; Certification Office FRS17 Disclosures, AR21 return

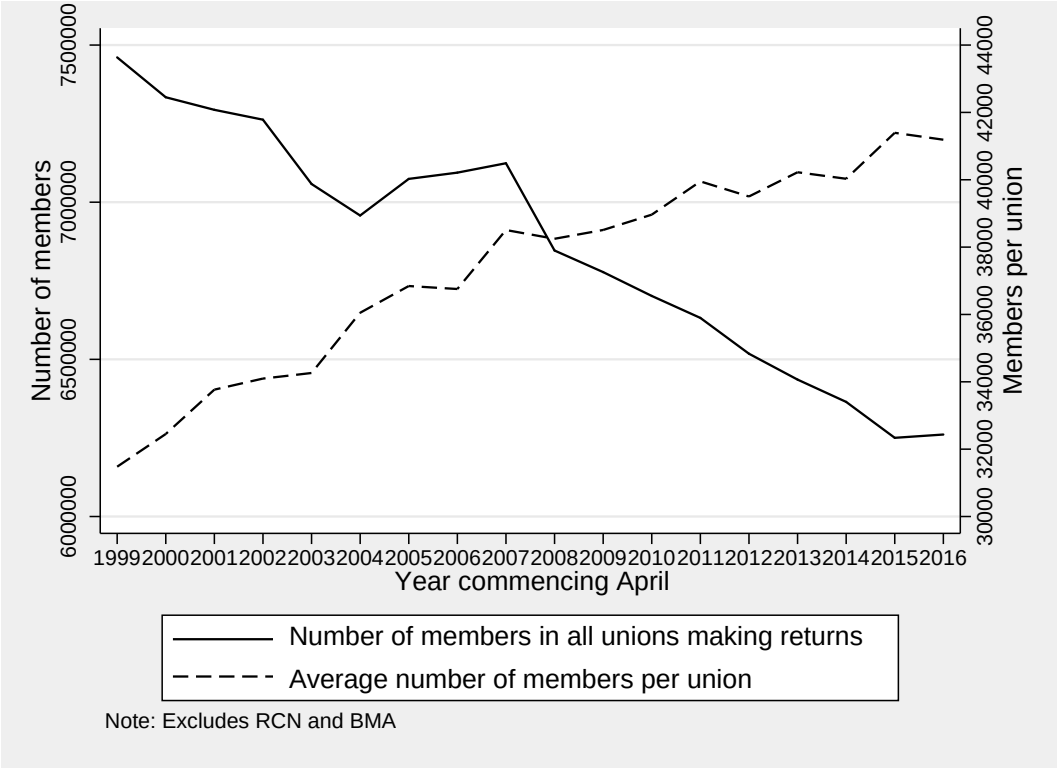
Notes; * Total remuneration / General fund total income from members.

** Registered to General Fund; no figures entered for 2017. Bracketed figures are gains

*** Scheme deficits plus unfunded obligations

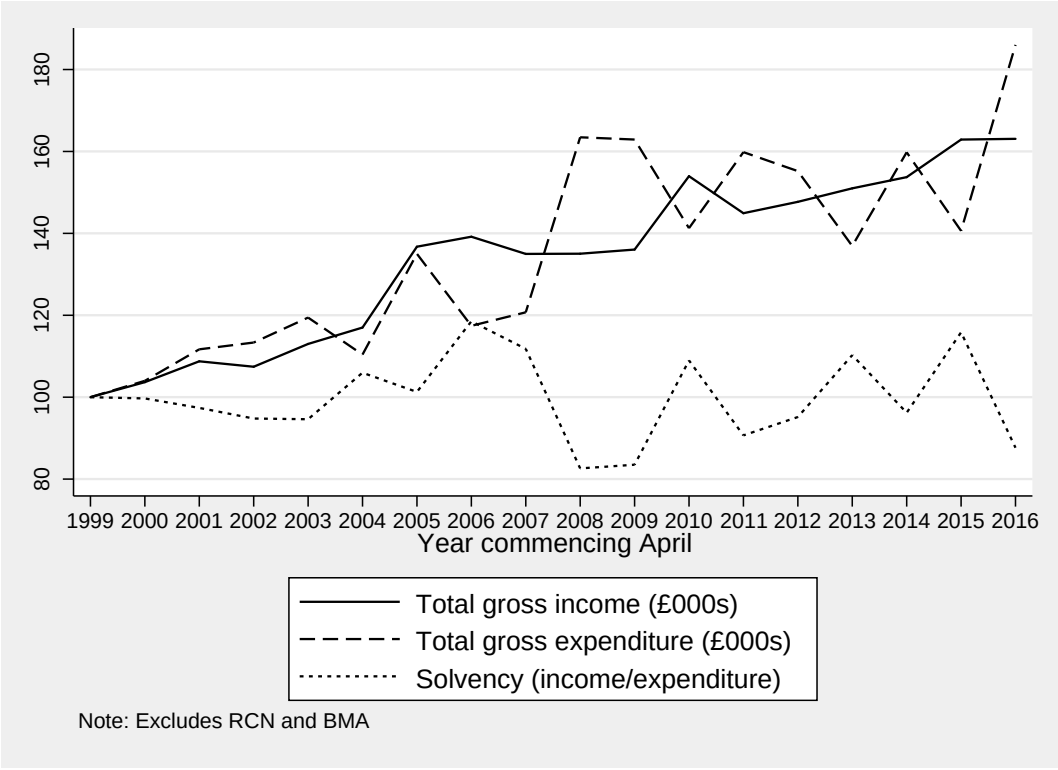
^Consolidation from 5 to 2 schemes

Figure 1: Numbers of members and average number of members per union, 1999/2000-2016/17



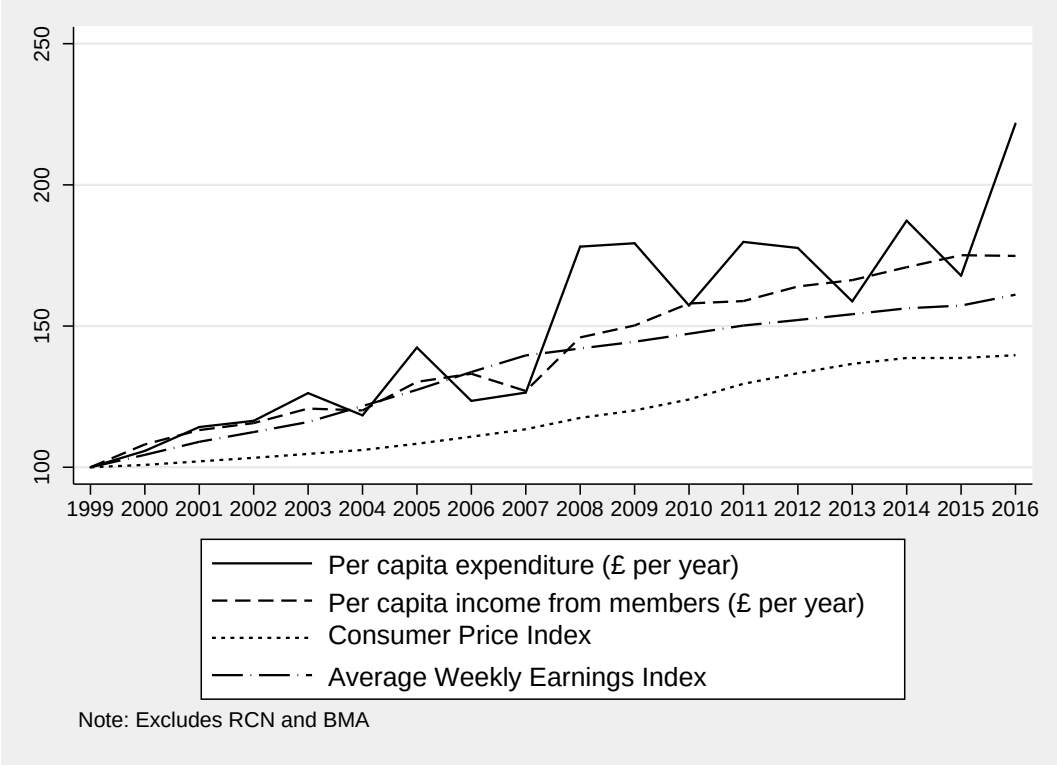
Source: Certification Officer Annual Reports

Figure 2: Nominal income, nominal expenditure and solvency, 1999/2000-2016/17 (indices 1999=100)



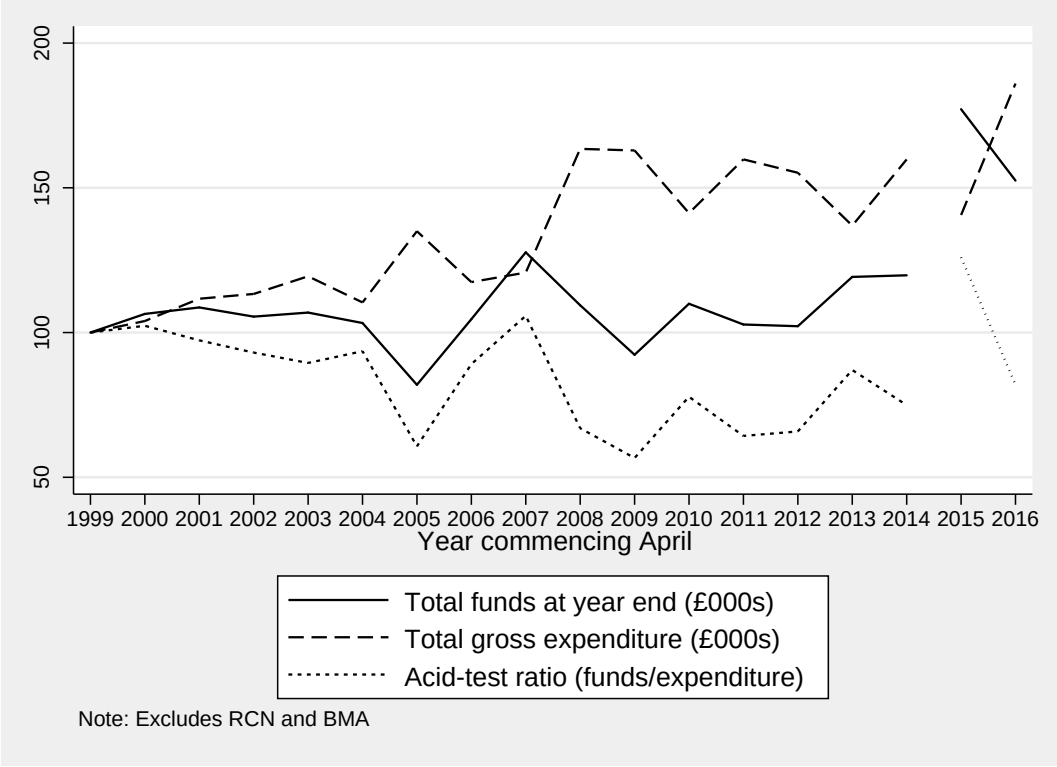
Source: Certification Officer Annual Reports

Figure 3: Expenditure, income, consumer prices and earnings, 1999-2016/17 (indices 1999=100)



Source: Certification Officer Annual Reports

Figure 4: Total funds, expenditure and acid-test ratio, 1999/2000-2016/17 (indices 1999=100)



Note: There is a discontinuity in the 'total funds' and 'acid-test ratio' series between 2014/15 and 2015/16 arising from a change to financial reporting standards (see footnote 5).

Source: Certification Officer Annual Reports