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Abstract

Britain's high-rise public housing era is widely seen as a serious social policy mistake. We show that the problems associated with this housing format were known to policy makers at an early stage, while tower blocks were also substantially more expensive, both from the perspective of central, and local, government. Conservatives governments championed high-rise mainly owing to the political advantages of urban containment. Major building contractors then used their close links with (central and local) policy-makers to aggressively lobby for high-rise `system building', as their expertise in this field enabled them to dominate the sector and exclude local competitors.

Key words: Housing, Construction, Government-industry Relations, Contracting, Corruption

Introduction

In common with many western industrialised nations, Britain embarked on a major programme of mass public housing from the 1950s, with tower blocks constituting a substantial and increasing proportion of new units. Central government established the `rules of the game' for the programme, and provided major financial subsidies, while local councils organised the actual development, through contracts with (overwhelmingly) private building contractors.[1] However, by the early 1970s tower blocks had fallen into disrepute and the volume of construction was declining sharply both in absolute terms and as a proportion of

all new public sector housing. This study explores the rise and decline of high-rise public housing in Britain, focusing on the interactions between the three main agencies involved in their development – central government, local government, and a small group of national contractors who received most of the building contracts.

Using hitherto unexploited archival sources, including Ministry of Housing and Local Government (MHLG) and Treasury records, we show that, contrary to some influential accounts, the key ministries involved with the programme were sceptical both about the potential for high-rise industrialised building to become more cost-effective than traditional low-rise housing, and the ability of this new building form to meet the needs of – particularly – families with children. These concerns were evident from the early days of the high-rise boom, while subsequent experience tended to reinforce them.

Tower blocks were initially justified within Whitehall as a means to prevent `overspill' from urban centres into suburbs or other greenfield areas, which threatened to erode Conservative support in key marginal constituencies. Corralling urban working-class households within urban boundaries took priority over `value for money' criteria for evaluating housing projects. This enabled other vested interests, especially large-scale building contractors, to lobby for tower blocks, built using industrialised methods, and thus gain an increasing share of public housing contracts - as expertise in high-rise system-building was limited to a relatively small number of large (typically national) firms.

Such lobbying increasingly involved the cultivation of close relationships with politicians and public officials, ranging from the provision of specialist advice to `gifts' and other incentives. By the late 1960s corruption in the awarding of tower block contracts had become ubiquitous, as illustrated in a series of high-profile corruption scandals which,

together with the introduction of stronger cost yardsticks by national government, and the Ronan Point disaster, brought tower blocks into disrepute.

This paper also addresses three major `myths' regarding the rationale for high-rise flats. The first - that high-rise offered a low-cost solution at a time of acute housing shortage - is largely a popular, rather than scholarly, myth, though some of the literature argues that policy-makers perceived the potential for major cost-savings, or even that such savings were achieved.[2] The second myth is that high-rise was an inevitable consequence of the town and country planning legislation of the 1940s, which allegedly prevented `overspill' development into rural areas.[3] We show that the creation of green belts and the blocking of urban boundary extensions was in fact a deliberate strategy of successive Conservative governments, to prevent overspill. Moreover, in most cases, target housing densities for the urban sites chosen could have been achieved using conventional housing or low-rise flats. The final myth is that local authorities were compelled to accept tower blocks on cost grounds, not because they were inherently more cost-effective, but because they carried much larger subsidies. We show that, even with the greater proportional subsidies per flat, high-rise was still a more expensive option for local authorities.

After briefly reviewing previous studies, the paper charts the evolution of British high-rise policy until the late 1960s, when the policy fell into disrepute. This is followed by an examination of the cost-effectiveness of high flats, using contemporary civil service analyses. We conclude that policy-makers' enthusiasm for high flats can only be convincingly explained in terms of Conservative Party political interests and the personal financial interests of local (and sometimes national) politicians and officials.

Explanations for the high-rise boom

The three main studies of Britain's high-rise era were published before most relevant MHLG and Treasury records became available and were largely based on interviews and published sources. The first, Patrick Dunleavy's 1981 monograph, *The Politics of Mass Housing in Britain,* argues that, - while there were strong pressures for the adoption of high-rise flats – advocated on architectural, technological, and industrial concentration grounds - there were also strong arguments against, including the high costs and unpopularity of this building form and the reduced amenity provided. He concludes that the sum of these pressures did not appear to justify the widespread adoption of high-rise solutions and explains this `rationality deficit' in terms of the strength of advocacy for urban containment by the suburban middle-class and rural upper-class, organised in the Conservative Party. Policy was then legitimised by being presented as a `technological shortcut to social change,' with public statements stressing the alleged productivity advantages of high-rise, `system-built' housing.[4]

Dunleavy's thesis was challenged by two subsequent studies. The first of these, Brian Finnimore's *Houses from the Factory*, argues that system-built high flats represented a genuine, but ill-judged, attempt to achieve `not only a revolution in building methods, but… better quality housing,' thus representing a failed welfare state initiative, rather than any triumph of Conservative politics.[5] A more extreme challenge to the Dunleavy thesis was advanced in Glendenning and Muthesius's *Tower Block,* which places responsibility for high rise flats on, `powerful local authorities [who] determinedly set about the task of keeping control of their own housing densities, by combining slum-clearance with a building policy at variance with Government-endorsed decentralism: the massed development of high flats on their own territory…'[6] These were also said to be responding to the town and Country planning legislation of the 1940s, which - in conjunction with a powerful `town planning establishment' - created a `land trap' for councils wishing to expand their urban boundaries.[7]

Glendenning and Muthesius identify the key actors in this process as `crusading' councillors, driven by a combination of determination to maximise numbers of new homes and considerations of `municipal power, independence, and prestige', while exonerating contractors, architects, and planners from any responsibility for promoting high flats or delivering a sub-standard product.[8] However, the evidence they offer, is – to put it midly – partial. They provide little discussion of other proposed explanations of local authorities' acceptance of high-rise (for example, *Tower Block* has almost no discussion of corruption in the awarding of building contracts); they reject claims that central government subsidies incentivised councils to build high (while simultaneously stating that building costs are excluded from their study); and they explicitly exclude the history of habitation, management, and maintenance of high flats, together with issues such as, `claims of structural inadequacy' as being outside their remit.[9]

The genesis of high-rise policy

Although tenement housing had been common in Scottish cities, and in much of Europe, there was almost no tradition of such housing in most parts of England and Wales, where the dominant urban dwelling form was the two-storey house. Similarly the vast majority of new inter-war homes, both for the public and private sector, were suburban semi-detached houses or short terraces.[10] Yet, despite the huge popularity of semi-detached housing, during the 1930s an influential section of Britain's architectural and planning elite became enamoured with modernist architecture, championed by Le Corbusier and the Bauhaus school, which found concrete expression in a number of high density mass public housing projects such as the Vienna workers' flats. These were seen as being superior to

suburban semis both on social grounds - fostering more cohesive communities - and aesthetic grounds, providing monumental buildings that would impact the urban skyline.[11]

During the 1940s such developments were strongly advocated by the architectural and planning professions, as a technocratic fix to the post-war housing problem - using industrialised techniques to undertake mass housing projects that were said to offer both cost and social benefits.[12] However, the Ministry of Works' initial optimism regarding the cost-effectiveness of mass-produced pre-fabricated housing soon proved ill-founded, with 15 of the 19 systems in production requiring (often substantial) subsidies to make them competitive with traditional techniques. The termination of subsidies in 1948, together with shortages of structural steel, led to a rapid return to conventional housing.[13] Meanwhile flats and maisonettes represented only around 10 percent of new local authority dwellings in England and Wales over 1946-50, with virtually no high-rise blocks being built.[14]

It was the Conservative governments of 1951-64 that launched Britain's mass housing era, the contribution of flats to new municipal homes rising to 22 percent during 1951-5, 35 percent over 1956-60, and 48 percent for 1961-5.[15] Meanwhile blocks of ten or more stories comprised 9 percent of new public sector housing during 1953-59 and reached an all-time peak of 28 percent during 1960-64. The shift towards high flats was partly justified by the need to prevent urban sprawl and conserve rural land – though as MHLG records show, the underlying aim was to preserve the political complexion of rural and suburban areas and avoid alienating their voters.

Inter-war overspill housing developments, such as the London County Council's `out-county' estates beyond the County's borders, or Manchester's Wythenshawe `satellite town' had faced substantial opposition from established local residents.[16] Several of the Attlee governments' `new towns' had also faced vehement local opposition, while there was

considerable antipathy in outer-London, rural Warwickshire, and Cheshire, to potential overspill developments from inner-London, Birmingham, and Manchester, which took on a party political edge given the divisions of these counties into Labour urban councils and Conservative county councils.[17]

While some accounts stress the importance of the Attlee governments' planning legislation as a key constraint on overspill development, only one green belt was formally proposed before 1952, for London. It was the following Conservative governments who effectively blocked overspill development, through three main measures: the creation of provincial green belts; Ministerial refusals to approve urban boundary extensions, and an informal suspension of the New Towns programme in England and Wales. The Conservatives' 1953 Housing White Paper emphasised the need to locate new housing, especially for slum clearance, within existing urban areas and support green belts around major cities.[18] In April 1955 the Housing Minister, Duncan Sandys, told the Commons, `I am convinced that, for the well-being of our people and for the preservation of the countryside, we have a clear duty to do all we can to prevent the further unrestricted sprawl of the great cities…I am accordingly asking all planning authorities concerned to [consider] proposals for the creation of clearly defined green belts.'[19] Many county councils seized on the 1955 Green Belts circular as a means to check expansion of their (often Labour-voting) cities, while successive Conservative governments typically rejected, or restricted, proposals for urban boundary extensions.[20] Government also blocked longer-distance overspill – via new town development – by failing to designate any further new towns in England and Wales during the 1950s.

This policy fostered dramatic growth in the proportion of new public sector housing comprised of flats, together with increased emphasis on industrialised building methods. Proponents claimed that this was a new technology, that offered astounding productivity

gains, by transforming building into relatively simple assembly operations for components pre-fabricated off-site in factories.[21] In fact these methods were long-established, but had been beset by the sort of problems they were to become synonymous with in the 1960s. Industrialised building, based on concrete prefabrication, dates from the 1860s and had been introduced to Britain by the turn of the century.[22] Various public housing contractors had employed these techniques in the aftermath of the First World War. However, most of the systems demonstrated structural problems such as cracking and dampness, usually necessitating expensive repairs within 10-15 years, problems which re-surfaced when Walter Gropius applied similar techniques at the Törten housing estate at Dessau from 1926.[23]

There were three British post-war government drives to encourage industrialised building; in 1946-48 (`prefab' houses), 1952-54, and in the early and mid-1960s. The first two were partly a reflection of scarcities in traditional building materials and crafts, while the third was more explicitly justified in terms of revolutionising building productivity – despite mounting evidence that industrialised building methods not only failed to offer major productivity advantages, but had higher costs per dwelling than conventional techniques.[24]

Urban councils were incentivised, via subsidies and pressure (such as threats to withhold the loan sanction for the necessary development funds) to build at high densities within their existing urban boundaries. A MHLG Housing Policy Committee document of July 1953 noted that to promote such development, increased subsidies for multi-storey flats should be considered.[25] However, there was not, as yet, any strong specific commitment to `high-rise' per se. In 1954 25 per cent of local authority homes were built by industrialised methods, though only about 20 per cent of new local authority houses in England and Wales were flats and of these only around a quarter were in blocks of five or more storeys.[26]

Despite their advocacy by influential architects, planners, central government, and some of Britain's largest contractors, there was well-informed contemporary opposition to both high flats and industrialised building. This included a group of, generally older, architects and planners led by F.J. Osborn, who still advocated the use of garden city-type suburban housing estates.[27] Some politicians also railed against the flats programme. In March 1953 Conservative M.P. Henry Brooke made a speech to the Royal Institution of Chartered Surveyors in which he noted that flats were not a suitable environment for families with children; houses were generally cheaper to build; and councils only chose flats on account of their higher subsidies.[28] Such arguments indeed weighed heavily with local authorities; in 1955, when the industrialised building drive was relaxed, the proportion of industrialised building fell sharply, reflecting both contractors' higher tender prices and the unpopularity of the new methods with councils and tenants.[29]

High flat development was boosted by the 1956 Housing Subsidies Act, which introduced a new per dwelling subsidy for flats, based on the number of storeys. Annual subsidies rose steeply up to the sixth storey and then increased by £1.75 per additional storey. Flats of six storeys would receive more than twice the subsidy for houses and fifteen-storey flats almost three times as much.[30] Another change introduced in 1956 was the discontinuation of the requirement that local authorities must make a rate fund contribution to the annual cost of housing, equivalent to half the government subsidy (implying that councils would bear at least a third of the costs of high-rise flats directly, together with any adverse impact on rent levels). This reduced the incentive for councils to keep costs down and - in conjunction with the new progressive subsidy for higher flats – substantially increased local authorities' incentives to build high.[31]

The early 1960s witnessed the start of a third industrialised building wave, championed by Sir Keith Joseph – heir to the Bovis property fortune – who had been

appointed Parliamentary Secretary to the MHLG following the 1959 election. In August 1962 he was promoted to Minister of Housing and Local Government and spoke enthusiastically at the October 1962 Conservative Party conference about the potential of `new building techniques' to speed up slum clearance and redevelopment.[32]

During this third phase high flats were often used even when target housing densities could have been met via conventional housing. This was typically justified on aesthetic grounds or the need to incorporate `mixed development'. However, Phil Jones found that this sometimes reflected a desire to award the contract to a large building contractor with whom the relevant council had forged a close relationship (as industrialised high-rise housing was much less vulnerable to competition from local builders than traditional housing).[33] Prefabrication methods were only found to be at all cost-competitive for high rise flats, which were in turn 35 – 85 per cent more expensive than low-rise dwellings.[34]

The third industrialised building wave witnessed greater use of `hard' industrialised building methods, using pre-cast concrete components manufactured off-site. These demanded a level of precision (both for their off-site prefabrication and on-site fitting) that was often beyond the competence of the unskilled labourers who were substituted for traditional building crafts. Poorly fabricated and/or fitted components contributed to the high maintenance costs of many 1960s tower blocks.[35] Growing use of pre-cast components was accompanied by an upsurge in `package deal' contracts – where contractors tendered not only for construction work, but for the professional services of architectural design and engineering consultancy traditionally undertaken by separate parties.[36] By 1964 some 46 per cent of all new public housing in England and Wales (excluding the London County Council and direct labour contracts) was undertaken under negotiated or package-deal contracts; a figure that rose to 55 per cent in 1966-8, before falling sharply to 28 per cent by 1970.[37]

Policy under Labour

Labour's October 1964 election victory was assisted by an ambitious commitment to achieve around 500,000 housing starts per annum by 1969, mainly through an expanded council housing programme. This responded to a major housing shortage, renewed concerns regarding homelessness, and malpractice - or even criminal behaviour - by private sector landlords (`Rachmanism').[38] In 1965 there was still an absolute housing shortage of around 670,000 (based on the excess of households over dwellings), while over the next ten years the number of households was expected to increase by around 150,000 per annum and the government was committed to slum clearance and the replacement of many older dwellings, deemed technically obsolete.[39]

Labour initially viewed industrialised methods as key to raising building productivity. To enable large forward orders for industrialised housing to be placed, local authorities were tasked with preparing four year programmes and grouping themselves into consortia. Bizarrely, this policy was advocated despite the fact that in 1965 industrialised techniques were still not price-competitive with traditional building methods.[40] Nor was there any great confidence among MHLG officials that they could prove more productive. A memorandum by Dame Eveleyn Sharp (the long-serving Permanent Secretary at MHLG) advocating their use, only went so far as arguing that, `with large scale production of a few selected systems, houses built by industrialised systems are likely to be competitive in costs and in design with those built by traditional methods.'[41] Nevertheless discussion of the new methods in political circles and in journals such as *The Economist* generally took their productivity advantages for granted.[42]

As Robert McCutcheon has noted, in Britain (and elsewhere) once a policy of industrialised building had been initiated, its evaluation was not based on the claims of huge productivity gains which had prompted its initial adoption, `but simply whether it is marginally competitive with traditional building', a process supported by continued assertion that this was a fundamentally `modern' technology as distinct from `inefficient and backward' traditional methods.[43] This fitted well with Labour's commitment to boosting productivity by unleashing the `white heat of this… [scientific] revolution.'[44] It was also in keeping with the widespread contemporary belief that industrial concentration would boost productivity growth. Indeed one of the principal impacts of industrialised building was to concentrate public sector house-building among a small group of major contractors. A survey found that four firms accounted for over 50 per cent of system building completions in 1966: Wimpey (No-Fines system, 12,085 completions); Laing (Easi-form, 2,763); Concrete Ltd (Bison, 2,733) and Wates (Wates High Rise, 1,980). Indeed Wimpey's No-Fines system alone accounted for eight per cent of the entire local authority housing market.[45] Meanwhile, in 1965 some 40 per cent of high flats approved for tender used industrialised systems, compared with only 17 per cent of low flats, giving contractors a substantial incentive to encourage councils to build high.[46]

System-built high flats were also claimed to offer important savings in scarce skilled building labour, by using pre-fabricated components produced by less skilled workers. However, on closer examination these arguments are shown to be deeply problematic. Contemporary estimates suggest that structural labour accounted for only 9 per cent of total building costs for traditional housing. Meanwhile proportionate labour costs were substantially greater for high-rise flats - one of the reasons why industrialised building focused on this format (because it could reduce labour costs for what was a particularly labour-intensive dwelling form).[47]

Once again central government pressurised local authorities to make greater use of system building. MHLG Circular 21/65 of April 1965 threatened to withhold loan sanction for municipal house-building for non-complying local authorities: `in deciding what programmes to approve the Minister will be influenced by the extent of the proposed use of industrialised methods.'[48] Labour's new Minister of Housing and Local Government, Richard Crossman, proved as strong an advocate for the new methods as his Conservative predecessor Keith Joseph. Crossman was notorious for his `hands-on' approach to managing policy; for example, he broke with Whitehall tradition by appointing Peter Lederer, a director of Costains, as a `special advisor' to help him formulate policy on industrialised building.[49]

However, the Labour government's enthusiasm for high-rise system building soon turned to disillusionment. The mid-1960s saw growing disquiet regarding the suitability and cost-effectiveness of system building, which, as one council representative noted, construction firms showed no enthusiasm for in their own private sector developments.[50] The New Town Development Corporations were also becoming sceptical, noting that some ambitious schemes showed heavy losses per dwelling and raised, `a good deal of uneasiness about whether they will in fact provide acceptable living conditions. No doubt they can be let now, in the London [new] towns at any rate, but will they let so readily in, say, ten years' time, when it is to be hoped the present acute shortage of housing will have been overcome?'[51] Examples were given of flats in Crawley, Bracknell, and Basildon, which did not let quickly and it was noted that tower blocks required, `an actual demand. They cannot be put up just for architectural reasons.'[52] Demand was said to be particularly weak for high-rise flats designed for families, though this had not inhibited London local authorities from developing large numbers of such flats, with rents heavily subsidised from the rates.[53]

As Figure 1 shows, high-rise developments peaked in 1966 (both in absolute terms and as a proportion of all public housing) and then fell steeply during the rest of Labour's

term in office. Indeed the Labour government had sought to cut back subsidies to high flats as early as 1965, though its Housing Subsidies Bill failed to reach the committee stage before the March 1966 general election, which delayed its passing into law until 1967.[54] As a June 1966 report for the Prime Minister noted, `the new subsidy system will encourage solutions which do not include too many tall blocks.'[55] While the Housing Subsidies Act of 1967 still provided additional flat rate subsidies for buildings of 4-6 storeys and over, the progressive subsidy for building higher than six stories was abolished. Furthermore, the Ministry's Housing Cost Yardsticks (introduced in 1963 as advisory guidelines on what prices and specifications MHLG would give loan sanction for) were made mandatory from 1967 and were strengthened.[56] This reflected the arguments of Alec Bellamy in the Ministry's Architects' division, who had called for this measure in order to prevent unnecessary development of high flats.[57]

[Figure 1 near here]

In conjunction with another 1967 decision, to make the more expensive Parker Morris housing space standards mandatory from 1969, these changes greatly reduced the financial viability of high-rise building, from both the local authorities', and the developers' perspectives.[58] Although their impact is conflated with the general cut in public housing expenditure in the aftermath of the November 1967 devaluation, which continued for the rest of Labour's time in office, the package of changes appears to have been decisive in making high flat development grossly uneconomic.[59] The number of flats of five or more stories, built using industrialised methods, fell from over 20,000 in 1967 to 5,500 in 1969 and only 752 in 1971.[60]

The cost-effectiveness of high flat development

As noted above, in contrast to popular perceptions that tower blocks were a cost-cutting measure, high flat development was more expensive than conventional housing (considerably so for very tall flats). According to a 1961 Alliance Building Society report, building costs per square foot averaged 40 shillings for houses, 45 shillings for maisonettes, 74 shillings for eight storey flats; and 83 shillings for 12 storey flats.[61] This is corroborated by unpublished official estimates. In 1958 high flats were estimated to cost over 50 per cent more than two storey houses, while also having much higher running and maintenance costs.[62] High flats were also more expensive than low ones: the average tender price for local authority flats in England and Wales during the 1964/65 financial year was £3,159 per flat for blocks of four or more storeys, compared to only £2,045 for blocks of three or fewer storeys.[63] Building in inner-urban areas did, of course, incur higher land costs, though for most tower-block developments the target densities could have been met using low-rise flats, or even conventional housing. Moreover, as Table 1 (below) shows, costs per dwelling rose substantially for higher flats, even when examined in terms of total costs to develop (inclusive of land).

Dunleavy estimated that if the money spent on municipal flats of five or more storeys had been spent on two-storey three bed houses, over 37 per cent more dwellings could have been built for the same cost, while the average dwelling size would have been over 30 per cent larger (though he acknowledges that the heavy weighting of London in the data exaggerates the cost saving).[64] However, the ultimate cost differential is much higher, as such estimates do not take into account the far greater maintenance costs of high flats built using industrialised methods and, critically, their much shorter lifespans.

High-density flats were sometimes justified in terms of preserving agricultural land.[65] However, there was no economic case for such arguments. Over the decade from 1955 British agricultural land contracted by only around one per cent, while net agricultural output

rose by more than 30 per cent. While farmland was typically worth £250 per acre (or £5,000-10,000 per acre with planning permission), the cost of `saving' an acre of land by building at higher densities was put at over £30,000.[66] Furthermore, under the 1947 Town and Country Planning Act, local authorities could acquire land at its `existing use value', using their powers of compulsory purchase, without any premium for potential development gain.

Moreoever, there is little evidence that government really attached great importance to preserving agricultural land. While land conservation arguments were sometimes employed by ministers and MHLG officials to justify high flat development to third parties, this was rarely mentioned in internal MHLG policy discussions, suggesting that it was more a legitimation device for policy than a core driver. The Treasury was even less keen on supporting agriculture. A 1955 Treasury working party rejected both the balance of payments and strategic arguments for supporting agriculture, while three years later, R.W.B. Clarke described agricultural subsidies as the `biggest government expenditure scandal'.[67]

Glendenning and Muthesius reject claims that local decisions to build high flats were driven primarily by the extra subsidies available. Nor do they accept that the 1956 subsidy change increased incentives to build high (while qualifying this with a statement that their study did not discuss building costs).[68] They further argue that there is no firm evidence that multi-storey building was consistently more profitable for contractors than low blocks of flats.[69] However, the MHLG and Treasury documents examined in this study contradict their claims. Even prior to the 1956 subsidy changes the MHLG's Principal Private Secretary, J.E. Beddoe, noted that the subsidy system encouraged local authorities to build flats even when housing densities did not require this. For example, Birmingham had built 180 flats in six-storey blocks, at a density of only 57 rooms per acre, that could have been met using conventional houses.[70] The more generous 1956 high flat subsidies were specifically designed to incentivise councils to build high. In response to criticism by the Parliamentary

Secretary regarding the high costs per room, and per square foot, of tower blocks at Sefton Park, Liverpool, Beddoe reminded him that using higher subsidies to encourage high flat development (which was inherently more expensive), was a specific aim of the new subsidy regime.[71]

While low density overspill developments were more cost-effective, this was not the key factor determining policy. As Beddoe noted, `The arguments for encouraging high flat building… rest largely on political and social grounds.'[72] He spelled these out in a separate memorandum as being: `to reduce overspill problems as much as we can. This is because the practical and financial problems associated with overspill are so intractable (to which I might add the political ones… all reception areas are ex-hypothesi Conservative seats, and usually marginal). The purpose was also to encourage high building for its own sake'.[73]

However, while the 1956 progressive height subsidy increased the proportion of total building costs paid by central government for higher flats, local authorities still had to pay more per dwelling for high flats than for low-rise developments. This is illustrated in a 1959 Treasury analysis, summarised in Table 1. The capitalised value of central government housing subsidies rose from 31 per cent of development costs for 4 storey blocks to 38 per cent for blocks of 6-8 stories and 43 per cent for blocks of more than 12 storeys. Yet, despite the higher proportionate subsidy, the capitalised value of the local authority contribution for flats of over five stories was significantly larger than for four storey blocks. Councils did not, therefore, face a cost imperative (or even a cost saving) to build high.

[Table 1 near here]

Information on the relative profitability of high flat development for contractors, compared to other forms of public sector housing, is more fragmentary. However, available evidence indicates that public sector flat development, particularly high flats, was unusually

lucrative. For example. a November 1954 Wimpey minute noted that their `no fines' building system provided them with a margin of 14 percent, which was exceptionally high for contracting work.[74] Moreover, the fact that the major contracting companies had the resources to generously finance networks of local and regional PR firms, that in turn provided lavish hospitality and other incentives to councillors and council officials, is itself an indication of the substantial margins available on high flat contracts.[75]

The cost premium for high flats is, of course, only half the story – it has to be weighed against the utility derived from them relative to lower-rise housing. Studies consistently pointed to inferior outcomes for tenants in tower blocks relative to conventional housing or low-rise flats.[76] Moreover, evidence for negative tenant impacts, especially for young children, was already available by the mid-1950s. For example, a MHLG memorandum of January 1954 noted that a recent Central Housing Advisory Committee report had found high flats to be unsuitable for children.[77] While policy-makers assumed that families with young children would be given flats on the lower floors, this proved impracticable – as the proportion of re-housed families with children exceeded their availability. Moreover, given the limited supply of housing it generally proved impractical to move tenants to lower floors when they came to have children.[78]

Subsequent studies generally corroborated these findings.[79] Pre-school children were shown to be particularly disadvantaged, as they lacked spaces for interaction with other children of their own age, with potentially permanent adverse impacts on their social development. Mothers typically prevented young children from playing on external balconies owing to safety fears, while outdoor play areas were difficult for parents to observe, were typically unsupervised, and were often perceived as being unsafe. This contrasted with the private gardens or enclosed areas adjoining conventional housing, where, `they can be left to play in safety with little or no supervision.'[80]

Studies also highlighted negative health impacts. Many adults (especially mothers) were found to have high incidences of stress, depression, and other psychological problems attributed to environmental factors associated with high-flat living.[81] Meanwhile children, in particular, were subject to unusually high incidences of respiratory infections, reflecting problems of dampness caused by poorly-fitted pre-fabricated building components, together with tower blocks' typically high heating costs and poor insulation (even by the standards of the time).[82]

Successive social surveys indicated that 80 – 98 per cent of working people would prefer a house to a flat (at equivalent rents).[83] Again, this information was available at an early stage. For example, in 1957 Birmingham's Housing Manager, John P Macey, told a Royal Institute of British Architects symposium on family life in high-density housing that 80 per cent of prospective tenants would rather live in a house than a flat. Evidence also consistently showed that most council tenants preferred to be allocated a traditional inter-war council house than a modern flat (sometimes overturning official council policy that the best tenants should be allocated to their new accommodation).[84]

Indeed, despite the housing shortage, by the early 1970s there were reports of some councils having difficulties finding tenants for new high-rise blocks.[85] Social problems and tenant dissatisfaction typically grew over the lifetime of each completed development, accentuated by the rapid physical deterioration of many tall blocks and consequent problems of dampness, cold, and poor accessibility (owing to lifts being frequently out of service), which in turn led to the flight of those tenants able to access better accommodation and their replacement by a growing proportion of `problem families' and associated problems of anti-social behaviour, vandalism, and crime.[86]

Explaining local authorities' acceptance of high flat development

The above analysis has shown that while central government heavily subsidised high flats, the subsidies were insufficient to make tower blocks cost-competitive with low-rise flats or houses, from a local authority perspective. This begs the question why there was so little political opposition to central government policy – with the new 1964 Labour government actually championing current policy during its first year in office?

While Conservative governments had prioritised blocking population overspill of urban (and often Labour voting) families into rural and suburban areas, urban councils also had a political incentive to keep their voters within their boundaries.[87] However, in most cases this could have been achieved without high-rise developments, given that inner-urban housing estates were typically at densities that did not require tower blocks. In order to understand the strong local government support for tower blocks, it is necessary to examine the close links between politicians and contractors (or their agents) that emerged particularly during the third industrialised building drive.

The push for industrialised building involved collaboration between central government, local government, and a relatively small group of national contractors, with whom they developed close, informal, relationships. Such relationships are analogous to those between governments and military equipment suppliers. In western market economies defence contractors devote considerable resources to cultivating close relationships with procurement agencies, to secure higher volumes of orders and higher prices for those contracts. Strategies aimed at achieving this include forging strong personal ties with senior military personnel and ministers; providing them with business services; and offering entertainment and gifts, together with lucrative directorships or consultancy positions.[88]

A number of senior Conservative ministers had strong links with building contractors. Keith Joseph was a former chairman of Bovis and his Minister of Public Buildings and Works, Geoffrey Rippon, was a director of Cubitts. Meanwhile several big contractors, including McAlpine and Taylor Woodrow, were major contributors to the Conservative Party and other right-wing bodies. Dame Evelyn Sharp was a close friend of the developer Neil Wates and was appointed as a director of Bovis on her retirement by Keith Joseph.[89] And in 1962 Albert Costain relinquished directorships of Costain-associated companies, when he was appointed Principal Private Secretary to Geoffrey Rippon. None of these arrangements may have broken any formal or unwritten rules of conduct, though the fact that *Construction News* carried an article on these and a string of other Tory Ministers and MPs who were directors of building-related firms under the title, `Do contractors need an MP on the board?', suggests that the trade considered they provided a competitive advantage.[90]

Such relationships created potential conflicts of interest. For example, in May 1963 Newcastle's Conservatives had demanded a public inquiry into potential corruption in the awarding of three blocks of municipal flats to the contractors Crudens, (involving the architect John Poulson and the local Labour politician T. Dan Smith). However, Smith also had strong links with Bovis and – according to Fitzwalter and Taylor - the possibility of damage to Bovis's reputation put the Minister, Sir Keith Joseph – who refused to pursue the matter – in a very embarrassing position.[91]

However it was principally the links between local politicians and major system-build contractors that were dramatically illuminated by the housing corruption trials of the 1970s (though a number of national politicians, including household names, were said to be `lucky' to have avoided prosecution). These mainly related to tower blocks developed during the 1960s building drive, where the major contractors used `hard sell' marketing techniques, promoted by `door to door salesmen'.[92] Councillors and council officials were offered

various inducements, including lavish business entertainment and expenses-paid trips (sometimes overseas) to see the contractors' systems in situ. These were increasingly organised by PR firms and consultancies, sometimes run by major local government figures such as T. Dan Smith (who pioneered this approach). Meanwhile the shift from open tendering to negotiated housing contracts opened the door to corruption, as a few key people– usually the council leader, the chairman of the housing committee, the local authority architect and the town clerk – enjoyed great discretionary power regarding which firms were awarded the contracts.[93]

Despite mounting evidence of pervasive malpractice, revealed by a series of high profile criminal trials, the 1974-9 Labour government persistently refused widespread calls for a general enquiry into local authority corruption in building contracts, or more specific enquiries regarding particular local authorities.[94] However, the ubiquity of bribery is reflected in the fact that one of the Trustees in Bankruptcy's concerns about John Poulson's tax returns was, `That whereas it was well known that architects got "kick backs" from contractors there was a noticeable absence of such receipts by Poulson...'[95] Indeed perhaps the most atypical characteristic of the two most notorious figures of the corruption scandal - John Poulson and T. Dan Smith (whose activities were fictionalised in the seminal BBC drama series *Our Friends in the North)*, was their practice of keeping extensive records, even after Poulson's bankruptcy, which considerably eased the police's job of pursuing charges that would otherwise have been difficult to prove.[96]

Those cases that did come to court revealed networks of PR companies working for building contractors (who – it was stressed during the trials – were not necessarily aware of their business practices). The PR agencies in turn either hired councillors and council officials, or offered them inducements.[97] For example, Maurice Byrne, a former mayor of Pontefract, informed Leeds Crown Court how, as public relations officer for the London-

based building firm Carlton Contractors (a subsidiary of the Trafalgar House Group), he gave `backhanders' of up to £1,000 to officials and councillors. Byrne, who pleaded guilty to ten charges of corruption, defended his behaviour by stating that backhanders were `the order of the day' in local authority contracting.[98]

Another case revealed how Birmingham Council's dominant contractor, Bryants, lavished hospitality, `Christmas gifts' and other presents, such as holiday accommodation, on councillors and officials in the West Midlands, with a list of recipients that contained some 2,000 names by 1968-9.[99] Birmingham's chief architect, Alan Maudsley, together with two colleagues, were arrested on various charges and, following their early guilty plea for conspiracy to corrupt, a further case led to Maurice Barwick (Bryants' former managing director), and two other ex-directors, pleading guilty on 28 counts of corruption.[100]

Yet it was the trials of John Poulson and his associates that captured the public spotlight. Poulson had pioneered the development of an integrated construction practice that combined the disciplines of the architect, engineer, and quantity surveyor, at a reduced fee. Police enquiries indicated that in the early-mid 1960s his organisation was highly regarded by hospital planners. However, as he expanded into other areas of public sector building he became increasingly reliant on what eventually became industrial-scale bribery.[101] This was organised by a string of PR firms, headed by leading figures in local politics, such as T. Dan Smith. The `Poulson scandal' began in early 1970 with two separate police investigations into corruption in local authority contracting in Wandsworth and Bradford.[102] This eventually led to 21 people being convicted on corruption charges, including prominent civil servants, local councillors, and council officials. In total 300 individuals had been short-listed for investigation (some avoiding prosecution by leaving the country).[103] The scandal also ended the careers of three MP's including Home Secretary Reginald Maudling. These escaped prosecution partly owing to a legal opinion that MPs were exempt from the corruption acts.

Moreover, in the 1970s prosecuting a former senior minister such as Maudling required a far higher evidence standard than that for ordinary mortals. As the Director of Public Prosecutions' legal counsel, John Cobb, told his colleagues, `Given the nature of the man,' he would only proceed if given, `a one hundred per cent, copper-bottomed guarantee of winning'.[104]

The end of the high flats era

Industrialised building methods peaked at 42 per cent of new public sector housing development in 1969, but then fell sharply to only 5 per cent by 1977.[105] In addition to the corruption scandals, the early 1970s also witnessed rising popular resistance to `comprehensive redevelopment' of inner-urban residential areas and growing perceptions of the negative environmental characteristics of tower blocks and high-density council estates. However, many local authorities had already lost confidence in high-flats, at least in part owing to the Ronan Point disaster. Ronan Point - a 22-storey block of flats owned by the London Borough of Newham – was constructed by Taylor Woodrow-Anglian Ltd, using the Larsen Nielsen system of large concrete panel construction. On May 16th 1968, two months after completion, a gas explosion in an 18th floor flat caused the `progressive collapse' of the whole southeast corner of the block, with 22 flats destroyed, four people killed, and 17 injured. At the subsequent tribunal Taylor Woodrow-Anglian claimed this was a major blast, with a force of 600 pounds per square inch. However, structural engineers appointed by the Treasury solicitor estimated that the flats had failed at an explosive pressure of only 3 pounds per square inch (an average domestic gas explosion). The enquiry's report found that a structural flaw inherent in the building system had made it vulnerable to progressive collapse, not only from explosions, but from fire or even high winds.[106]

The collapse of local authority confidence stemmed not directly from the Ronan Point failure, but from the fact that councils were left to foot much of the bill for remedial work necessary to strengthen similar blocks, together with lost rental income during the work and replacement costs for all gas appliances (deemed dangerous in such blocks even after strengthening). At least 1,893 blocks of flats, comprising 127,585 dwellings, were found to require strengthening, at a cost of around £30 million (£426 million in 2016 prices).[107]

June 1969 saw an ill-tempered meeting between the Minister of Housing and his officials, and representatives of local government associations. These pressed the government to meet the costs of remedial work, stressing that they had been `pressurized' into using system building - Circular 21/65 made this a quid pro quo for being granted generous housing allocations.[108] The Minister countered that, `Authorities had never been "pressurized" into using high system built flats' – though MHLG records contain repeated references to a policy of pressurising councils to do so.[109] Mr Ward of the MHLG also argued that government sponsorship of system building, `had been done in the interests of all housing authorities, with the object of getting more houses built with the resources available.'[110] This again appears disingenuous, given that industrialised techniques were recognised by MHLG as being more expensive than traditional methods.

An initial government offer to pay for 40 per cent of the strengthening work for blocks of over six storeys was later raised to 50 per cent.[111] However, the local authorities (some of which faced significant rent and rate rises to cover the remaining strengthening costs, plus lost rents and appliance replacements) remained deeply unhappy.[112] Attempts to secure any financial contribution from the contractors proved fruitless. The diffusion of responsibility for design between the contractors, design engineers, local authority engineers, and Building Regulations, made it very difficult to pin down financial liability. Ironically, in some cases (such as Taylor Woodrow Anglian's blocks at Newham) the contractors had to be

paid further substantial sums to strengthen their own developments - as they were the licensees of the specific building systems.[113] Much remedial work was said to have been carried out with a similarly cavalier approach to that of the original construction, eventually leading to further expensive maintenance work, or early demolition.[114]

By the 1980s changes to the skyline regarding tower blocks generally involved their demolition, rather than construction.[115] This was a far cry from what the government intended when it set the yardstick for industrialised building system approvals on the basis that they were `sound and suitable for a 60 year loan sanction,'[116] and contrasts sharply with the legacy of conventional semi-detached inter-war and post-war council houses, which have typically yielded long service lives with low depreciation and substantial rental value growth.

Conclusion

The above evidence shows that tower block development was not a policy `mistake', in that it achieved the aims of the Conservative governments that launched the policy – to corral urban working class families within their existing boundaries and prevent substantial overspill into surrounding areas that might erode Conservatives support (both through the inflow of Labour voters and the alienation of Conservative voters opposed to overspill into their `back yard'). Strong advocacy of high-rise housing projects by the architectural and planning professions had thus acted to `legitimise' a policy deemed expedient on party-political grounds. This also served to concentrate public housing contracts among a small number of national building firms, as – while many local builders could tender for conventional public housing – relatively few had expertise in large-scale industrialised building systems. The policy achieved these objectives, but at huge economic and social costs, particularly for the tenants of these blocks and their children.

Given Britain's pluralistic democratic system, it might have been expected that this policy would have been resisted by the Labour Party and (predominantly Labour) urban councils. However, there was remarkably little such opposition– so little that the new 1964 Labour government initially pressed for an intensification of high-rise system building. The above analysis partially corroborates Dunleavy's findings that political opposition was diffused by the presentation of high-rise system building as a technological short-cut to solving the housing problem, together with generous grant subsidies. However, we show that, contrary to the findings of previous studies, local councils still faced higher costs per dwelling for high-rise flats than for conventional housing or low-rise flats.

Urban councils accepted system-built tower blocks partly because this maintained their political constituencies in situ, but also, increasingly, because of the close relationships between those councillors and officials who controlled the local planning process and the small group of major contractors (or their agents) that dominated system building. As such, the tower block era was essentially the product of a national government pursuing its party-political interests and local (and, to some extent, national) politicians pursuing their personal financial interests. However, between 1965 and early 1970s this alignment of interests collapsed. The new Labour government had realised the poor cost-effectiveness of high-rise industrial building by the end of its first year in office and introduced legislation that would remove much of the extra subsidies for high flats. The aftermath of the Ronan Point disaster illustrated the financial vulnerability of councils that embraced high-rise housing solutions, while the corruption scandals of the early 1970s spotlighted the vulnerability of politicians and public servants to criminal investigation. Meanwhile a growing public backlash against comprehensive redevelopment of inner-urban areas, high flat construction, and modernist architecture, fatally weakened the legitimising influence of the architectural and planning professions.[117]

Britain's high-rise era had important long-term consequences for the residualisation and stigmatisation of council housing. From the early 1970s a growing number of councils faced difficulties finding tenants for high flats and increasingly resorted to moving in tenants from `sink' estates. This led to a growing association of tower blocks with `problem' tenants as (for example in Birmingham) certain blocks would only be accepted by those really desperate for accommodation.[118] Adverse tenant selection (and associated problems of vandalism, crime, and anti-social behaviour) were compounded by the rapid physical deterioration of many tower blocks. These included limited structural failures (of external panels and similar components); dampness; problems with lifts; and unreliable and/or costly utilities.[119]

Renovation to modern standards was often impracticable, owing to inherent design flaws, or poor specifications (such as only a single staircase for exit in the event of fire).[120] However, the main constraints were financial, given the scale of the potential maintenance bills facing many councils with substantial stocks of high flats. These increasingly opted for short-term `patching-up' solutions, such as the installation of cheap external cladding. Even the 2009 Lakanal House fire in Camberwell, London, which left six people dead, and an inquest verdict that highlighted botched renovations, failed to bring about recommended improvements which might have prevented the much more severe Grenfell Tower tragedy in June 2017, where at least 71 people lost their lives.

While tower blocks were a disaster from an economic and social perspective, they served (and, arguably, continues to serve) the agendas of those vested interests behind the policy. The Conservative governments' policy of fencing working-class populations within existing urban boundaries prevented any substantial dilution of Conservative majorities in suburban and rural areas vulnerable to over-spill; while both central and local government

politicians and officials could claim to be addressing the housing problem, while quietly reaping private financial rewards from contractors whose success was dependent on their support. Meanwhile the small group of contractors who dominated system-building used this episode to transform themselves into highly-profitable multinational companies and have since retained their dominant position in public-sector contracting.[121] Britain's tower-bock era thus serves as a salutary example of how co-operative alignments of political and corporate interests may lead to policies that have severe economic and social costs, not only during their implementation, but for later generations.

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[1] Yelling, "Incidence of Slum Clearance, 235; Urban, *Tower and Slab,* 14-15.

[2] Finnimore, *Houses from the Factory*, 79-103, argues that policy-makers saw this as a cost-reducing technology, while Rowlands, Musterd, and van Kempen, *Mass Housing in Europe*, 8-9; and Urban, *Tower and Slab*, 14, state that industrialised building reduced building costs by achieving scale economies.

[3] Glendinning and Muthesius, *Tower Block*, 157-9.

[4] Dunleavy, *Politics of Mass Housing*, 101-103.

[5] Finnimore, *Houses from the Factory*, 1-2.

[6] Glendinning and Muthesius, *Tower Block*, 155.

[7] Ibid, 157.

[8] Ibid, 156 & 173.

[9] Ibid*,* 180, 322, and 325.

[10] See Scott, *Making of the Modern British Home*, Chapters 2-4.

[11] Burnett, *Social History of Housing,* 247-8; Cooney, `High Flats,' 158-9.

[12] Rowlands, Musterd, and van Kempen, *Mass Housing in Europe*, 8.

[13] Finnimore, *Houses from the Factory*, 35-48.

[14] Holmans, *Housing Policy*, 114. Figures for ratios of flats to all municipal housing include new towns, but not housing associations or `pre-fabs'.

[15] Holmans, *Housing Policy*, 114.

[16] Scott, *Making of the Modern British Home*, 205-212.

[17] Shapely, "Council Wars," 104-112; Ward, *Peaceful Path*, 188-94; 241-5; Holmans, *Housing Policy*, 118.

[18] Cooney, "High flats," 163-4.

[19] Hansard, HC Deb 26 April 1955 vol 540, 44-5.

[20] Jones, "Rise and Fall,", 130; 133; Shapely, "Council Wars."

[21] McCutcheon, "Science, Technology, and the State," 355.

[22] Urban, *Tower and Slab*, 10.

[23] Scott, *Making of the Modern British Home,*. 39; Bauhaus Dessau: Bauhaus Buildings,Törten Estate by Walter Gropius Toww.bauhaus-dessau.de/toerten-estate-4.html (accessed 27th September 2017).

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[27] TNA, HLG 101/394, extract from "The Local Authority View on Subsidised Housing," *Municipal Journal*, 62, no. 3202 (2 July 1964).

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[30] Dunleavy, *Politics of Mass Housing*, 162-3.

[31] Ibid, 161-162.

[32] Jones, "Rise and Fall," 45.

[33] Ibid, 217; Dunleavy, *Politics of Mass Housing,* 115.

[34] McCutcheon, "Science, Technology, and the State," 362.

[35] Jones, "Rise and Fall," 124.

[36] Cooney, "High Flats," 168.

[37] Glendinning and Muthesius, *Tower Block*, 201.

[38] Davenport-Hines, "Rachman, Peter (1920?–1962)."

[39] TNA, EW24/30, "Housing," memorandum by Evelyn Sharp, 22 July 1965.

[40] TNA, EW24/30, "Industrial Housing Demand," memorandum by J.E. Beddoe, 24 June 1965.

[41] TNA, EW24/30, "Housing," memorandum by Evelyn Sharp, 22 July 1965.

[42] "Houses, Fast," *Economist*, 1039.

[43] McCutcheon, "Science, Technology, and the State," 364-5.

[44] Speech by Harold Wilson at Labour Party Annual Conference, 1 Oct. 1963, available at: http://nottspolitics.org/wp-content/uploads/2013/06/Labours-Plan-for-science.pdf

[45] Finnimore, *Houses from the Factory*, 93.

[46] TNA, PREM3/962, report prepared for the Prime Minister, Harold Wilson, signed R.H.S.C., 23 June 1966.

[47] Dunleavy, *Politics of Mass Housing,* 62.

[48] Cited in Finnimore, *Houses from the Factory*, 104.

[49] Jones, "Rise and Fall," 48.

[50] Finnimore, *Houses from the Factory*, 104-5.

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[52] Ibid.

[53] Ibid.

[54] Dunleavy, *Politics of Mass Housing,* 156-8.

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[56] Cooney, "High Flats," 170-171.

[57] Jones, "Rise and Fall," 51.

[58] Parker Morris standards were originally presented as guidelines in Ministry of Housing and Local Government, *Homes for Today and Tomorrow*.

[59] Dunleavy, *Politics of Mass Housing*, 38 & 121-3; Jones, "Rise and Fall," 51-53; Cooney, "High Flats," 171.

[60] Berry, *Housing*, 87.

[61] Alliance Building Society, *Housing Land Crisis*, 30.

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[64] Dunleavy, *Politics of Mass Housing*, 87-88.

[65] Shapely, "Council Wars," 104-6.

[66] Best, "Against High Density."

[67] Peden, *Treasury and British Public Policy*, 497-98.

[68] Glendinning and Muthesius, *Tower* Block, 174 & 180.

[69] Ibid, 207.

[70] TNA, HLG 101/394, J.E. Beddoe to F.S. Wilkinson, 19 January 1954.

[71] TNA, HLG 111/143, J.E. Beddoe to Parliamentary Secretary, MHLG, 26 March 1958.

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[74] Wellings, *British Housebuilders*, 63-64..

[75] Fitzwater and Taylor, *Web of Corruption*, 39-40, 69, 153, 268.

[76] For a review of studies conducted in the 1960s, see Darke and Darke, *Health and Environments*.

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[78] Maizels, *Two to Five in High* Flats, 1.

[79] See Darke and Darke, *Health and Environments*, 8-10.

[80] London Metropolitan Archives, GLC/DG/HG/11/055, LCC, "Play Facilities for Younger Children Living in High Flats," report by London County Council Architect and Director of Housing, 29th June 1961; further report, by the Architect, Director of Housing, and Education Officer, 27th June 1962; Maizels, *Two to Five in High Flats*, 23.

[81] For a review of early studies, see Darke and Darke, *Health and Environments*, 10-13.

[82] Jones, "Rise and Fall," 151-152.

[83] Cooney, "High Flats," 158.

[84] Jones, "Rise and Fall," 149-151.

[85] Ibid, 157.

[86] Ibid, 83.

[87] Urban councils varied in their enthusiasm for high-rise housing, with some major metropolitan councils, such as Manchester and Glasgow, initially following a policy based mainly on "overspill" suburban estates of conventional houses. Shapely, "Council Wars," 100.

[88] See, for example, Singleton, "Full Steam Ahead?" 983-4.

[89] Dunleavy, *Politics of Mass Housing,*. 20-21.

[90] TNA, AT39/7, copy of Laurie Flynn, `Do Contractors Need an MP on the Board?' *Construction News*, 16 April 1970.

[91] Fitzwater and Taylor, *Web of Corruption*, 102-5.

[92] "Houses, fast," *Economist*, 1039.

[93] Fitzwater and Taylor, *Web of Corruption*, 153.

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[100] Ibid, 294.

[101] TNA, J291/59, Metropolitan Police, Company Fraud Dept. report, 14 February 1974.

[102] Fitzwater and Taylor, *Web of Corruption*, 185.

[103] Ibid, 9.

[104] Fitzwater and Taylor, *Web of Corruption*, 250-252 (252 for quote).

[105] McCutcheon, "Science, technology, and the state," 360.

[106] TNA, HLG118/1147, "Ronan Point – General Background," undated note, c. November 1970; Dunleavy, *Politics of Mass Housing,* 244 & 247.

[107] TNA, HLG118/1302, "Ronan Point Grant," memorandum, July 1970, Appendix II; Dunleavy, *Politics of Mass Housing,* 177. 2016 prices calculated using https://www.measuringworth.com/ukcompare/relativevalue.php (accessed on 13th June 2017), deflated by retail price index.

[108] TNA, HLG118/1147, "Strengthening of High Rise Flats. Financial Implications," notes of a meeting by J. Marlow, 3 June 1969.

[109] Ibid. For records that make explicit reference to pressuring local authorities, see TNA, HLG118/866, "Ronan Point," Treasury memorandum 4 December 1968; TNA, EW 24/30, "Industrial Housing Demand," memorandum by J.E. Beddoe, 24 June 1965.

[110] TNA, HLG118/1147, "Strengthening of High Rise Flats. Financial Implications," notes of a meeting by J. Marlow, 3 June 1969.

[111] Most councils received a 49 per cent grant, the balance being set aside for a fund to further assist one or two relatively small authorities with modest rate resources.

[112] TNA, HLG118/1302, "Background Note. Grant for Strengthening High Blocks of Flats," November 1970.

[113] Dunleavy, *Politics of Mass Housing,* 249.

[114] Jones, "Rise and Fall," 171-2.

[115] Ibid, 60.

[116] Association of Metropolitan Authorities, *Inquiry into British Housing*, 17.

[117] Holmans, *Housing Policy in Britain*, 114-15; Dunleavy, *Politics of Mass Housing*, 353.

[118] Jones, "Rise and Fall," 157-8.

[119] Jones, "Rise and Fall," 45.

[120] Association of Metropolitan Authorities, *Inquiry into British Housing.*, 18.

[121] Powell, *British Building Industry*, 174-6.

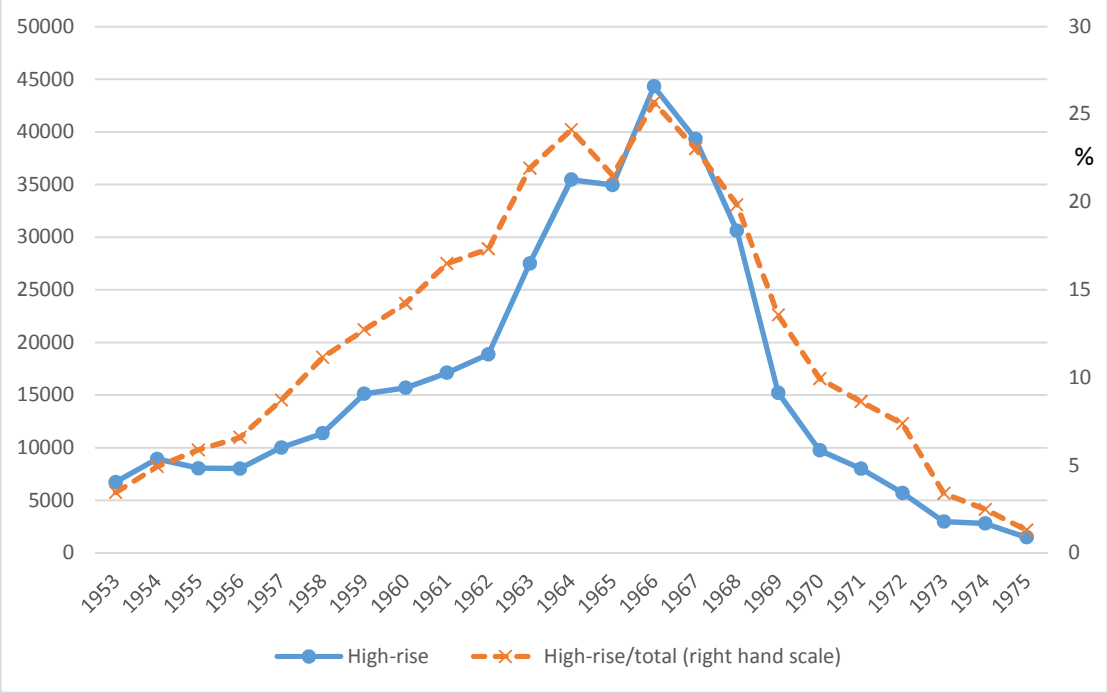
Table 1: Government housing subsidies per flat, for flats in blocks of four or more storeys, c. 1959

Height	Annual subsidy	Capitalised value	Total cost to develop	Capitalised value/total cost	Cost to local authority
Storeys	£	£	£	%	£
4	32	528	1,693	31	1,168
5	38	626	1,829	34	1,207
6-8	50-53.5	855*	2,258	38	1,400
9-11	55.25-58.75	940**	2,221	42	1,288
12 or more	60.5	1,000	2,308	43	1,316

Source: TNA, T 227/830, document on capitalised values of principal housing subsidies n.d., c. February 1960.

Notes: Subsidies are payable over 60 years; capitalised on the basis of the Public Works Loan Board interest rate (5.875 per cent). Total cost to develop based on data for 1st January 1958 to 30th June 1959. * For a seven storey flat. ** For a 10 storey flat.

Figure 1: High-rise flat tender approvals in England and Wales, number, and proportion of total local authority dwelling approvals, 1953 – 1975



Source: adapted from: Dunleavy, *Politics of Mass Housing*, 41.

Note: High-rise flats are defined as those of five or more storeys.