National Audit Office

Ministry of Defence

Ministry of Defence's arrangement with Annington Property Limited

Technical appendix

JANUARY 2018

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The National Audit Office scrutinises public spending for Parliament and is independent of government. The Comptroller and Auditor General (C&AG), Sir Amyas Morse KCB, is an Officer of the House of Commons and leads the NAO. The C&AG certifies the accounts of all government departments and many other public sector bodies. He has statutory authority to examine and report to Parliament on whether departments and the bodies they fund, nationally and locally, have used their resources efficiently, effectively, and with economy. The C&AG does this through a range of outputs including value-for-money reports on matters of public interest; investigations to establish the underlying facts in circumstances where concerns have been raised by others or observed through our wider work; landscape reviews to aid transparency; and good-practice guides. Our work ensures that those responsible for the use of public money are held to account and helps government to improve public services, leading to audited savings of £734 million in 2016.

Technical appendix

Introduction

1 This appendix provides background information on the financial model and return calculations done for the January 2018 value-for-money report, *The Ministry of Defence's arrangement with Annington Property Limited* (2018 Report). It also contains details of the assumptions and limitations behind the work.

Objectives of the financial model

2 The objectives of the financial model are to:

- assess how the original assumptions of the sale have turned out in the hindsight of subsequent events; and
- model the actual cost to the taxpayer of the sale so far.

Background information to the financial model

3 We built a financial model to replicate what we understand to be the approach taken by the Ministry of Defence (the Department) in compiling the base case within its original Appraisal, which it used to make decisions about whether and how to sell the married quarters estate. In constructing our model we relied on the limited surviving supporting documentation, including our August 1997 report, *Ministry of Defence: The Sale of the Married Quarters Estate*[1] and the Parliamentary record of the subsequent hearing of the Committee of Public Accounts. We were not able to obtain the original financial model which provided the figures for the government's Investment Appraisal at the time of the sale in 1996, as we understand that the records have not been kept.

4 The outputs of our replica model are close to, but do not exactly match, the outputs produced in 1996. This is because we do not have the assumptions used for the exact cash flows, particularly around what was believed at the time to be the likely release of housing stock. As a result our replica model calculated a minimum sale price of £1,852 million, which is £113 million (6.5%) above the base case numbers in our 1997 report.

5 The original model uses a mixture of cash flow rents over the forecast period, and the present value of the properties at the end of the period, to stand for the opportunity cost of the value foregone. This is an unusual mixture of both cash flow and balance sheet items in a single financial model. However, we have used this basis for valuing the cost of the sale and leaseback in order to allow comparison to the original model. The estimated fair value of the properties in the Annington accounts also provides a proxy for the rent that will have to be paid for the properties, since we do not know the actual rents that will apply after the site-by-site rent reviews beginning in 2021. This should not be taken as an indication that we believe the valuation is an accurate assessment of future rents.

1 Comptroller and Auditor General, Ministry of Defence, *The Sale of the Married Quarters Estate, Session 1997-98*, HC 239, National Audit Office, August 1997.

Comparing the Investment Appraisal with actual performance

6 **Figure 1** compares the base case with the actual performance to date. The actual performance is displayed in two different ways. These are:

- on the social time preference rate (STPR) at the time (6% excluding inflation); and
- with the current STPR (3.5% excluding inflation).

At the time of the sale, the differential between the actual sale price and the base case for the in-house option was estimated at £113 million for the 25-year period (December 2016 prices). Comparing this to the actual performance to date, this differential has grown so far to £2.2 billion and £4.2 billion, depending on the discount rate used.

Figure 1
Comparison of the Department's business case with actual costs

Item (all in December 2016 prices)	Base case (1996) 25 years Original discount rate (6% real) (£m)	Actual (to date) First 21 years' costs only Original discount rate (6% real) (£m)	Actual (to date) First 21 years' costs only Current discount rate (3.5% real) (£m)
Present Value (in house)	**692**	**2,742**	**4,289**
Income from sale of surplus	348	713	941
Residual value of houses	326	2,010	3,329
Other	19	19	19
Present Value (operate lease)	**-1,789**	**-1,786**	**-2,249**
Rents paid by the Department	-1,834	-1,910	-2,411
Department's profit share	43	124	160
Other	1	1	1
Payments in two parts	**-39**	**-39**	**-39**
Minimum sale price	**2,520**	**4,568**	**6,578**
Actual sale price	2,408	2,408	2,408
Differential	**113**	**2,160**	**4,170**

Notes

1 The present value is derived by discounting future costs and revenues to their value at the time of the appraisal in 1996, then uplifting them for inflation to the end of 2016.

2 The discount rate in the model is set by HM Treasury, and changed from 6 per cent to 3.5 per cent in 2003.

Source: National Audit Office

7 The model only focuses on the material line items in the Investment Appraisal. These are 'Income from sale of surplus', 'Residual value of houses', 'Rents paid by the Ministry of Defence' and the 'Ministry of Defence profit share'. Other items (for example, cost of sales and the financing cost of the transaction) are minor and we have not attempted to replicate them due to the absence of supporting evidence. In our model we used the numbers shown in the 1997 NAO report.

8 We have only illustrated the actual costs to date, and have not applied forecasts for the whole period to 2021, unlike the Department's original 1996 base case. We decided not to do this because of the level of uncertainty. We could have used the Department's original assumptions for the remaining four years. However, this would have meant using a level of house price inflation below the discount rate, and, as a result, the further out it modelled the costs, the lower the present value of the transaction. This is somewhat counter-intuitive and the opposite effect to what has actually happened to date.

Assumptions

9 The assumptions are detailed in **Figure 2** overleaf. The 'actual' numbers are based on our calculations and are uplifted from 1996 by the GDP deflator as at December 2016. The base case numbers have been taken from our August 1997 report.

Annington and investor return calculations

10 The return calculations of Annington and its investors are based on Annington's annual accounts and debt prospectuses it has published over time (**Figure 3** on page 7). For simplicity purposes we have not adjusted for the actual date of the individual cash flows and assumed March as year-end. **Figures 4**, **5** and **6** on pages 8, 9 and 10 provide the annual breakdown of the cash flows and return calculations. Information is only displayed for the years when a cash-flow occurred. In order to realise these returns, Annington must be able to sell the properties at their valuation in the company accounts.

Figure 2
Summary of assumptions used in our report modelling

Assumption	Base case	Actual
Income from sale of surplus	Receipt from surplus sale = 75% of average house price x number of houses sold.	Same calculation as in base case.
Average house price	£23,038 in 1996 as per NAO August 1997 report *The Sale of the Married Quarters Estate* (NAO report). This is on 75% of the average receipt for past sales. Average price grows at the 'Property growth rate' (1%).	75% of the average house price based on the annual actual fair value of the portfolio calculated by Annington.
Number of houses sold	Straight-line interpolation from units sold in 1996 (55,055 units) to expected portfolio size in 2021 (30,752 units). Units put up for sale in any given year are assumed to be sold over a two-year period.	Same as base case.
Residual value of houses	Net present value (NPV) of the expected future fair value of the properties.	NPV of the actual average fair value of the properties as calculated by Annington, multiplied by the assumed number of houses in the portfolio in 2017 as per the base case projection.
Rents paid by the Department	Rent paid = number of units leased multiplied by the annual rental payment after adjustment. Open market rent in 1996 as per NAO report.	Actual total rent paid by the Department to Annington for actual period (sale to 2016-17).
Number of units leased	Straight-line interpolation between units sold in 1996 (55,055 units) and expected portfolio size in 2021 (30,752 units).	Actual number of units leased.
Rental payment	£4,797 per year average open market rent before adjustment in 1996 and applies a 58% adjustment (£2,015). Grows at rental growth rate (1%).	Actual rents paid.
Departmental profit share	As per NAO report.	Actual profit share paid by Annington to the Department.
Government discount rate (real)	The original base case used a discount rate of 6% excluding inflation.	Depending on case either 6% or 3.5% excluding inflation.
Inflation	2%.	Actual figures are on a nominal basis and include actual inflation.
Property growth rate	1% real.	Actual figures imply a 9.74% nominal Compound Annual Growth Rate.
Rental growth rate	1% real.	Actual figures imply a 4.48% nominal Compound Annual Growth Rate.

Note

1 The original model appeared to use the 'fair value' valuation of the estate under the contract to calculate the average house price. We have therefore used the fair value in our analysis. Using the vacant possession value would be a more appropriate reflection of the true underlying value of the portfolio if the Ministry of Defence returns the properties to Annington. This would increase the Department's loss to date.

2 National Audit Office report referred to: Comptroller and Auditor General, Ministry of Defence, *The Sale of the Married Quarters Estate*, Session 1997-98, HC 239, National Audit Office, August 1997.

Source: National Audit Office

Figure 3

Annington's return calculations (paragraph 2.18 in the 2018 Report)

Year end (Figures in £m)	Oct 1996	March 1998	March 1999	March 2000	March 2001	March 2002	March 2003	March 2004	March 2005	March 2006	March 2007	March 2008	March 2009	March 2010	March 2011	March 2012	March 2013	March 2014	March 2015	March 2016	March 2017 (Fair value)
Investment – equity	-289.0																				
Investment – debt	-1,373.0																				
Rental income		111.0	111.0	115.0	121.0	127.0	134.0	130.0	136.0	142.0	146.0	152.0	150.0	154.0	157.0	159.0	163.0	162.0	166.0	172.0	178.0
Net sales proceeds		6.5	10.0	12.9	30.6	36.9	79.4	47.4	23.0	34.3	30.7	11.8	3.7	17.4	13.3	13.7	17.0	22.2	23.3	35.6	13.8
Gross value of portfolio																					7,273.0
Project cash flows	-1,662.0	117.5	121.0	127.9	151.6	163.9	213.4	177.4	159.0	176.3	176.7	163.8	153.7	171.4	170.3	172.7	180.0	184.2	189.3	207.6	7,464.8
Unlevered Project IRR (Fair value)	**13.4%**																				

Source: National Audit Office

Figure 4

Return achieved by Nomura return (paragraph 2.19 and 2.20 in the 2018 Report)

Accounting year (Figures in £m)	1996-97	1997-98	1998-99	2002-03	2012-13
Investment – equity	-289		-10.5		
Investment – debt	-1,373				
Payout – warrants		152.2	48.7	327.6	
Pay-out – dividends/ payments in kind					550
Pay-out – refinanced shareholder loans		239			
Gross sales price					3,200
Outstanding debt					2,750
Net sales proceeds					450
Cash flow to equity	-289	391.2	38.2	327.6	1,000
Equity internal rate of return	56.4%				
Equity modified internal rate of return	18.8%				
Reinvestment rate	12.5%				

Source: National Audit Office analysis including data published by Annington

Returns achieved by Terra Firma and its co-investors (paragraph 2.21 in the 2018 Report)

11 Since 2012 number of investors including Terra Firma Special Opportunities Funds I and II L.P. have owned Annington. At the time of publication of the 2018 Report, Annington's latest available accounts was its March 2017 report. Annington has refinanced all its outstanding debt in its current financial year and Terra Firma and its co-investors have injected additional equity. We have reflected the new capital injection, but due to the absence of more up-to-date information being available at the time the report's contents were finalised, we assumed that the net book value of its portfolio remained unchanged from the figure in its 2016-17 accounts.

Figure 5
Returns achieved by Terra Firma and its co-investors

	2012-13	Terminal year (assume 2017-18)
Investment – equity (£m)	-450.0	-550.0
Investment – debt (£m)	-2,750.0	
Book value of portfolio (£m)		7,273.0
Book value of other properties (£m)	297.5	
Outstanding debt (£m)		2,906.7
Net book value of portfolio (£m)		4,663.8
Cash flow to equity (£m)	-450.0	4,113.8
Equity internal rate of return		55.7%
Equity modified internal rate of return		55.7%
Reinvestment rate		12.5%

Notes

1 Portfolio valued at 'fair value', that is, on the basis that the estate is currently occupied.

2 The rates of return are estimates, and may be subject to a number of factors, including the performance of the UK housing market, Annington's operational performance, and the financial structure of the investment.

Source: National Audit Office

Figure 6
Investor returns

We calculated investor rates of returns as follows:

Type of return	Explanation	Basis of calculation
Internal rate of return (IRR)	A metric used in capital budgeting measuring the profitability of potential investments.	$IRR = \sum_{t-1}^{t} \frac{C_t}{(1+r)^t} - C_o$ Where: C_t = Net cash inflow during the period t r = Discount rate t = Number of time periods C_o = Total initial investment cost
Modified internal rate of return (MIRR)	An IRR calculation where the cash flows are reinvested at a different rate than the project IRR.	$MIRR = \sqrt[n]{\frac{FV\ (Positive\ Cash\ Flows,\ cost\ of\ capital)}{PV\ (Initial\ Outlays,\ Financing\ Cost}} - 1$ Where: n = number of years FV = future value PV = present value

Source: National Audit Office

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