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Recruitment, Retention, Wastage, and Retirement: Career Patterns in the Officer Corps of the British Armed Services 1970–82

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for

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A policymaking tool has been fashioned for those concerned with officer recruitment and promotion policy. The tool is basically a transition matrix with elements that consist of the probabilities in any one year that, (a) a civilian will join the officer corps, or (b) a captain will be promoted to major, or (c) a major will exit the service for civilian life, and so forth. The size of the matrix at its fullest is determined by the number of discrete ranks plus the civilian status--say eleven. The number of elements within it would be 121 (11 x 11), although the value of many of these will be zero, corresponding to the near impossibility in normal times of promotion through more than one rank at a time.

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Final Report

Recruitment, Retention, Wastage and Retirement : Career Patterns in the Officer Corps of the British Armed Services 1970-82*

Previous reports outlined a new methodology whereby the snapshot probabilities of a person occupying a particular rank in the armed services making a transition to another rank or to civilian life could be related to the steady state distribution of ranks that should eventuate if these 'transition' probabilities remained unchanged.

This report is a first attempt at fashioning the concept into a tool for policy makers.

The Model

For reasons of simplicity the officer corps is divided into three rank groupings or bands (army equivalents) civilian status making up a fourth category.

We can write down the probabilities that in any given time period - say one year - an officer or intending officer will change or retain his rank band or category, in the form of a matrix.

	Civilian	2nd Lt-Major	Lt.Col. Brigadier	Major Gen. and above
Civilian	.99	.01	0	0
2nd Lt.-Major	.1	.84	.06	0
Lt. Col.-Brigadier	.3	0	.68	.02
Maj.Gen. and above	.6	0	0	.4

The 'transition probabilities' have been carefully chosen to produce an overall rank structure close to that obtaining in the combined British armed services. In other words when multiplied by itself an infinite number of times the matrix transforms to one of four identical rows : .9306, .058, .011, .0004. The last three figures in the row corresponding to the relative tri-service populations

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of the rank banding in question. The 'transition probability' chosen for civilian to 2nd Lt-Major category is computationally convenient but, is of course much higher than is actually the case. However this does not affect the relative size of the three transformed matrix elements referring to population of the rank bandings.

The above transition matrix implies for instance that in any one year an officer with a rank in the 2nd Lt.-to-Major band has a six percent chance of promotion to the Lt.Col-to-Brigadier rank band, a ten percent chance of leaving the services, and an 84 percent chance of remaining within his existing rank band. A more detailed analysis would split the rank bands into the individual traditional rankings, producing an eleven by eleven matrix rather than the four by four given. However the added complexity of this procedure would for present purposes give comparatively meagre returns, and is not therefore proposed.

The operational usefulness of the transition matrix even standing alone is not to be despised. For one thing in a 'steady state' condition of a fixed size corps of officers the total number of civilians entering the corps must balance the total number of officer departures, and the extreme left hand column of transition probabilities must reflect this fact. The 'zeros' in the matrix reflect the vanishingly small probabilities of demotion but they also reflect the absence of entry from outside except at the lowest rank band. Even so it is possible to imagine, for instance, outside (if not civilian) entry at higher rank bands as a theoretical option if one branch of the armed services had a shrinking officer requirement whilst others had an increasing requirement.

Economic Man

The elements of the transition matrix are constrained in other ways besides. For instance each row must add up to unity. In addition, if an officer is assumed to make choices about leaving or staying with the services according to the relative economic attractiveness of the two options[1], then row elements must be interconnected in other ways. The probability of an officer leaving, Po, from within the 2nd Lt-Major rank band can be written as:

$$Po = K \frac{S.P. + (1 - u) \times C.S.}{Pm \times S.M. + Pb \times S.B.}$$

1. This broad assumption by itself is not too unreasonable. What is not always true in practice is the implicit assumption that an officer always has a free choice unhampered by any contractual arranagement. In practice between $\frac{1}{3}$ and $\frac{1}{2}$ of exits are 'premature' at the officer's own request.

Where Pm and S.M. are the probability of remaining in the 2nd Lt-Major band and the average salary of that rank band, respectively, and Pb and S.B. are the probability of being promoted to the Lt.Col-Brigadier rank band and the average salary of that band, respectively. And S.P. is the service pension (for the average retiree at 2nd Lt-Major rank), u the relevant civilian unemployment rate, and C.S. the relevant average civilian salary level.

If we now suppose that for exogenous reasons (a fall in civilian unemployment or an increase in civilian salaries) the value of Po were to rise, and if we further suppose that military salaries were not adjusted to compensate, we now have the tools to allow us to predict the effect on rank structure.

To use the original transition matrix, if Po went from .1 to .125 then either Pm would have to fall to .815 or Pb to .035 (or some combination of the two). Leaving to one side the last possibility, a fall in Pm to .815 would produce a long run rank distribution of .051: .010: .0003. A fall in Pb to .035, .058 : .006 : .0002. The latter would mean one general for every 320 other officers, for former one general for every 200.

This line of reasoning can be taken a little further. If we supposed that Po historically has a tendency to rise (because, say, of a failure to match civilian salaries and a reluctance to trim service pensions) the consequence will be upward drift in rank distribution, since a fall in Pb is unlikely to be engineered because of its effect on morale. Nothing is for nothing, however, and a top heavy officer corps will have a larger overall salary bill than a corps of the same size containing a smaller proportion of general officers. Savings might then be looked for through shaving the salary diffentials between ranks, which in turn will actually act to increase Po (slightly), completing the circle.

Conclusion

A policy making tool has been fashioned around the concept of the 'transition' matrix which can be applied to a range of questions concerning the structure and remuneration of the officer corps of a modern defence establishment.

A semi-qualitative demonstration of the tool in use was performed to illustrate the conditions under which rank structures can grow top heavy as an indirect result of 'premature' retirements from middle ranks.

September 1985
Lancaster.

Ian Bellany

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5 REM PROGRAM PRODUCING N'TH POWER OF TRANSITION MATRIX AS N TENDS TO INFINITY
6 REM MAX SIZE OF MATRIX 15*15-CAN BE ALTERED AT LINE 30
7 REM PROGRAM LANGUAGE CBM BASIC

READY.

5 REM PROGRAM PRODUCING N'TH POWER OF TRANSITION MATRIX AS N TENDS TO INFINITY
6 REM MAX SIZE OF MATRIX 15*15-CAN BE ALTERED AT LINE 30
7 REM PROGRAM LANGUAGE CBM BASIC
20 PRINT"J":  REM CLEAR SCREEN
30 DIMA(15,15),B(15,15)
40 PRINT"DIMENSION OF MATRIX";
50 INPUT R
60 PRINT"MATRIX ELEMENTS ";
70 FORJ=1TOR
80 PRINT"ROW";J
90 FOR I=1TOR
100 PRINT"VALUE COLUMN";I;
110 INPUT A(J,I)
115 IFJ<>ITHENA(J,I)=A(J,I)+1
120 NEXTI
130 B(J,J)=1
140 NEXTJ
150 FOR J=1TOR
160 FORI=JTOR
170 IFA(I,J)<>0THEN210
180 NEXTI
190 PRINT"SINGULAR MATRIX"
200 GOTO 500
210 FORK=1TOR
220 S=A(J,K)
230 A(J,K)=A(I,K)
240 A(I,K)=S
250 S=B(J,K)
260 B(J,K)=B(I,K)
270 B(I,K)=S
280 NEXTK
290 T=1/A(J,J)
300 FOR K=1TOR
310 A(J,K)=T*A(J,K)
320 B(J,K)=T*B(J,K)
330 NEXTK
340 FOR L=1TOR
350 IFL=JTHEN410
360 T=-A(L,J)
370 FOR K=1TOR
380 A(L,K)=A(L,K)+T*A(J,K)
390 B(L,K)=B(L,K)+T*B(J,K)
400 NEXTK
410 NEXTL
420 NEXTJ
430 PRINT
494 FORJ=1TOR
495 FORI=1TOR-1
496 C(1,J)=B(1,J)
497 C(I+1,J)=C(I,J)+B(I+1,J):NEXT
498 PRINTINT(C(R,J)*1000+.5)/1000;
499 NEXT
500 END
510 REM ADAPTED FROM LON POOLE @ MARY BORCHERS "SOME COMMON BASIC PROGRAMS"
520 REM OSBORNE/MCGRAW-HILL,1979,PP114-115

READY.
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