Planning Permissions
and the Optimal Capital Stock

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The Planning Permissions data series was originally intended to be an indicator of potential output flows from the building industry[1]. Whether it does in fact represent such an indicator is moot, since there appears to be little if any relationship between the number of permissions granted and the output of the construction industry. However, it could plausibly be argued that the data series provides a proximate measure of the desired level of capital stock in the economy, a theoretical construct usually denoted by K*. This paper investigates whether this is indeed the case.

The structure of the discussion is as follows. Section one will briefly describe the theoretical notion of K*. Section two will then analyze the nature and scope of the planning permissions data series, and its subdivisions. Section three considers the determinants of investment, and by extension, K*. Section four formulates the model used to investigate the above hypothesis, and presents the test results. Finally, section five looks at some implications which arise.

The desired capital stock K*

The theoretical construct K* is one which appears regularly in analysis textbooks to explain the determination of investment flows into an economy. K* represents the level of capital stock which, on aggregate, entrepreneurs wish to hold.

Any deviation of K* from the actual capital stock will cause entrepreneurs to wish to alter the capital stock which they hold, leading to investment or disinvestment within the economy. Hence the determinants of investment are seen to be the factors which impact on K*. It should be noted at this stage that the term "capital stock" refers to all kinds of productive capital items, not just to industrial and commercial buildings. This should be borne in mind throughout the discussion below.

Scope and nature of the planning permissions data series

The planning permissions data series is compiled on the basis of planning permissions granted by local authorities under the Local Government (Planning and Development) Act 1961. Only the kinds of development covered by the act are included in the data series, and so the activities of many state bodies and much of the activity in the agricultural sector are excluded.

It is important to be aware of the process by which the data is compiled. When a planning permission is granted, the details of the proposed development are forwarded to the C.S.O., from which they compile the data on the total number of permissions granted and, where relevant, the total proposed floorspace of the approved developments. However, no information on the cost of the developments is available from the local authorities, as such information is not required for planning applications. In an attempt to overcome this difficulty, the C.S.O. writes to the person or company to which the permission

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1 The Planning Permissions Data series is published as a quarterly bulletin by the C.S.O. and also in the annual Irish Statistical Bulletin.

has been granted requesting details of the cost of the proposed development. Since replies to these requests are received in only around 60% of cases, the figures given for the total cost of developments for which permissions have been granted represent no more than approximations.

The dubious reliability of these cost data means that we must look to the other two aggregations - total number of permissions granted and total floor space - for our potential measure of K*. Problems also arise, however, with the first of these. Taking the residential sector as an example, one permission might cover a single "once-off" house, or it might refer to an estate of three hundred houses. Similarly, in the industrial sector, the number of permissions granted is in no way weighted to account for the size of the approved developments. Consequent on these difficulties, the most suitable of the three aggregations to use is that of total floor area.

The data is presented by the C.S.O. under various "functional categories". The following planned floor area sub-totals are given: dwellings; commercial buildings; agricultural; government health and education; and others. Since the current discussion is concerned with private-sector investment for productive purposes, the focus of attention is limited to the "commercial buildings" and the "industrial buildings" categories. Although the "buildings for agriculture" category does represent private-sector investment, the fact that most construction in the agricultural sector is excluded from the terms of the 1961 Act suggests that its inclusion in the analysis would represent a distortion.

The most significant implication of this decision is that the thrust of the analysis has moved from the general, economy-wide notion of K*, to an examination of the combined "commercial buildings" and "industrial buildings" sub-totals as a proximate measure of k**, where k**

represents the optimal stock of industrial and commercial floor-space. Although it would appear that the above is a severe limitation, the benefits to be gained in accuracy make such a restriction desirable. Moreover, on a theoretical level, it can be argued that changes in K* will be reflected in changes in K**, thus supporting the assertion that the narrow range of data chosen will be indicative of trends in the private sector as a whole.

The determinants of investment

Since K* is not really a measurable quantity, the method of testing the initial hypothesis involves examining whether the determinants of the planning permissions variable are similar to those that the theory of investment tells us determine the level of K*. These factors which affect the level of investment (through their effect on K*) are well documented, and require no explanation here. Attention is usually focused on the real rate of interest, the level of business confidence, and changes in the level of national income.

While the theory of investment has always laid considerable stress on the real rate of interest as a determinant of K*, it is omitted from the current discussion. This is for several reasons. Firstly, it eliminates the considerable computational difficulties involved in establishing a reliable series of data on real rates of interest prevailing in the Irish economy for the years in question. Secondly, it allows attention to be devoted to changes in levels of national income and business confidence, variables which arguably are more likely in the long run to affect the type of investment decisions currently under consideration.

Having decided to ignore interest rate changes, the next problem which arises is that of choosing a variable to use as a proximate measure of business confidence. Here, the number of bankruptcies in Ireland during the years in question is used[2]. The

data refers to the number of bankruptcies processed by the Irish courts for the years in question and so does not reflect the total number of business failures during the period concerned (this would require, *inter alia,* data on the number of receivers and liquidators appointed). One might, nevertheless, reasonably expect a negative relationship to exist between the number of bankruptcies in any year and the level of business confidence, and by extension, between the number of bankruptcies and $K**$[3].

The final influence on the desired capital stock that is held to be significant is changes in the level of national income. The theoretical argument is that increases in national income cause firms to revise upwards their desired level of capital stock in order to meet anticipated rises in demand for their products. Long-run data on national income is available from the Department of Finance[4]. Several measures are obtainable, but in the current context, attention is focussed on Gross Domestic Product at Constant (1985) Factor Cost by sector. Since the scope of enquiry has already been limited to examination of decisions made in the commercial and industrial sectors, data on the industrial sector alone is used.

The model and tests

The immediate difficulty which arises is one of specification. The nature of the

influence which the factors outlined above exert on $K**$ must be formulated. For the purposes of this paper, the following test was chosen.

Four specific independent variables were delimited, and observations of these for n years were obtained. The n years in question are those for which data was available, 1970-1987[5]. The first of these variables, X1, is the percentage change in G.D.P. that occurred in the year prior to observation more formally:

$$X1_t = (G_{t-1} - G_{t-2}) / G_{t-2}$$

where Gn represents G.D.P. in the industrial sector in year n, and X1n is the observation generated by this calculation for the year n. The second independent variable, X2, is simply X1 lagged by one period, or specifically:

$$X2_t = (G_{t-2} - G_{t-3}) / G_{t-3}.$$

X3 is defined as X2 lagged by one period. Finally, X4 denotes the number of bankruptcies in a year.

Simple linear regressions of Y (the total floor area of approved developments in the commercial and industrial sector) on each of these independent variables were carried out. The results of these regressions are presented in Table I. The conclusions to which these results give rise are discussed in the fifth and final section.

The test results - comments and conclusions

The test results are initially quite

2 This data is published regularly in *The Irish Statistical Bulletin.*

3 It has been suggested that a rise in the number of business failures is a sign of increasing confidence in the economy. This sort of analysis is, however, best applied to the type of situation which existed in the U.S. in the early 1980s where small firms were making a major contribution to increases in employment. As stated above, the bankruptcies figures used here are more likely to be negatively related to the level of business confidence, although it would be difficult to control for changes in attitudes to bankruptcy.

4 Department of Finance Research Paper 1/90. Department of Finance Databank of Economic Time Series: Long Run National Accounts. By Hurley, D. G. and Donohoe, B.

5 The planning permissions data series was first published in 1970 and the latest figures available are for 1989. The G.D.P. data in the Department of Finance Research paper cover the years 1964-1987, and the particular edition of the Irish Statistical Bulletin I used gave bankruptcy figures from 1971 onwards. Therefore the regressions executed were for observations on all five variables for the years 1971-1987 inclusive.

18 observations		13 error degrees of freedom			
Sum of squares total		3263427.78	R-squared		.46544
Sum of squares errors		1744514.12	F(4,13)		2.82971
Sum of errors		0	Prob>F		.06868
Regression Variance		134193.39	Rbar-squared		.30095
D-W statistic		.71962	Corr(Y, Yhat)^2		.46544
Variable	*Estimate*	*Std error*	*t-statistic*	*Prob value*	
Constant	1190.4	350.24	3.399	.00475	
X1	2956.77	2594.71	1.1395	.27504	
X2	2652.31	2359.64	1.2403	.28133	
X3	3531.62	2283.63	1.54649	.14598	
X4	-11.56	6.8156	-1.69606	.11367	

Table I

disappointing. An examination of the t-statistics demonstrates that the null hypothesis Ho: B=0 would be accepted in either a one-tailed or a two-tailed test at the 5% significance level for all the X variables. Moreover, examination of the F-statistic suggests that the regression is overall not very significant at the 5% level. Thus the standard tests yield negative results.

Some encouragement may be taken, however, when the tests are repeated at a 10% significance level. The F-test results in the rejection of the above stated null-hypothesis, and one-tailed t-tests suggest statistically significant effects for the X3 and X4 variables.

Of particular interest are the results for X4. Analysis of the simple regression of Y on X4, and the multiple regression results indicate that by far the largest proportion of the R-squared in the multiple regression can be attributed to this particular independent variable. Moreover, the t-statistic in the simple regression was significantly large.

Conclusion

The conclusion, then, is that, while the regression results presented here are initially far from convincing, they suggest that further investigation of the original hypothesis is warranted. Considerable respecification of the model is obviously required. A revised model might include a different functional form, as well a more inclusive set of independent variables.