CAN CLUSTERS THEORY HELP REALIZE CYPRUS'S DESIRE TO DEVELOP CENTRES OF EDUCATIONAL EXCELLENCE?

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Abstract – *This paper aims at exploring the various factors which could play a synergic role in the formation of a cluster system to support the development of higher education services as a competitive business endeavour. It proposes that Porter's cluster dynamics might be applied to education in Cyprus in order that it might grow a regionally competitive sector within the Region. This is a goal set out in the Government's Strategic Development Plan (1999-2003) and is brought into clearer focus with the accession of Cyprus to the EU in May 2004. Indicative evidence of clustering is presented based on the UK's Research Assessment Exercise and policy issues are discussed for the Cyprus Government.*

Introduction

*T*his paper considers the economic notion of clusters as proposed by Porter (1998) has relevance if higher education is the subject of the clustering rather than a contributor to an industrial cluster. We develop such an idea, tentatively, as a potential way of realising the economic and political goals of Cyprus to be a centre for higher education in its region (Strategic Development Plan 1999-2003). This development of the cluster concept is discussed within the wider context of clusters and their growth and sustainability but we acknowledge that we are only viewing education through one lens and ignoring, only for the purposes of this paper, discussion on higher education from a humanistic, liberal or existentialist perspective.

The paper discusses the potential to create compatible government initiatives to encourage educational clusters as identified by Porter's analysis. This creates supplemental problems of defining the nature of tertiary education, the notion of States' involvement in education and the role of private education. In the Cyprus context this is discussed against the heritage of Greek politicised higher education and the development of an educational region able to support the competitiveness of the European Union.

The paper has four sections. In the first, Cyprus's higher education history and current situation is considered. In the second we consider how the development of

a higher education cluster might be facilitated and the conditions for the flourishing of an educational cluster where education itself is the competitive value-added outcome of the cluster. The third section offers indicative statistical support for our proposition based on UK's Research Assessment Exercise (REA). The fourth section considers the wider implications of the paper with regard to the major elements and factors of a cluster relevant to Cypriot higher education system.

Until relatively recently Cyprus has had a tradition of educating its young people in higher institutions outside the country; predominantly in Greece and the UK. The Island now has a well-regarded State university (University of Cyprus) in the south and a number of private higher education colleges and universities throughout the Island. In the occupied North the growth in higher education provision has been through private institutions with considerable encouragement from the government of Turkey. However, things are changing for Cyprus. The country's accession into the EU is agreed and negotiations on UN sponsored settlement proposals are under consideration. Although these issues are of international importance we take a more myopic view of the changes and focus on how a unified Republic of Cyprus might be able to build a cluster of higher education excellence.

Cypriot higher education

Cypriots like, or at least attend, higher education.

The current structure of the higher education sector is summarized in the Government booklet, 'Higher Education in Cyprus'. The central role is given to the Department of Higher and Tertiary Education within the Ministry of Education and Culture. This Department covers registration, supervision and accreditation of all the private institutions and certain aspects of the University of Cyprus[1] and, in association with appropriate other ministries, the public institutions of non-university higher education. This structure, however, is radically changing in preparation for Cyprus's accession to the EU. The government has already approved two new universities – the University of Applied Sciences and Arts and an Open University – and accreditation criteria have been devised to turn some of the existing private institutions into universities. The Greek Cypriot desire for higher education seems to be as much driven by intrinsic desires for higher studies as well as an instrumentality of employability (Menon, 1997). This has led to a mismatch of graduate skills with labour needs, resulting in an over-supply of graduates.

In the South the demand for higher education has risen considerably over the last 20 years and at present over 60% of all secondary school leavers continue in post-secondary education (Department of Statistics and Research, 1999). This figure is based on a 130% increase in student numbers in tertiary education from 1970/

71 to 1998/99. The local market of secondary school students is static and numbers about 8,000 in the Republic. Although this demand is larger than the State can accommodate it has lead to the development of an effective private sector which, since the 1970s has had more students than the public sectors mainly vocational provision (Koyzis, 1989). This influenced special measures to be introduced in 1987 to accredit private institutions, which eventually ensured the recognition of higher education programmes, by the Government of Cyprus. The three major private colleges in Cyprus have each experienced increased numbers as the Government legitimized them by offering grants to students on their recognized programmes. This leaves the private colleges to fight for a market share in a biased market where support from the government confers status on an institution. In this paper, we will not be making the case for private versus public institutions in this paper but we follow Zumeta (1992) who, when referring to the USA, concludes that non-profit higher education 'is valuable to the nation.'

The Republic's policy toward foreign students entering their higher education institutions seems to be a peculiarity in that it makes entry difficult for students and also inhibits them working during their studies. Not withstanding the signing by Cyprus of the Bologna Declaration, its participation in the European Research Area and its emphasis on transferability, a coherent strategy to facilitate students attending Cypriot tertiary education is yet to emerge. This lack of governmental coherence runs contrary to the developments in France, UK, Germany and many other EU member states who have recognized the importance of competitive positioning of their national education systems. Haug & Tauch (2001) have noted, 'the issue of competitiveness is seen as an important priority for an amazingly high number of countries.'

In the North the infrastructure is similar to that in the Republic. Each has a predominant university; in the south is the University of Cyprus and in the North it is the Eastern Mediterranean University that is also the largest, accounting for nearly 50% of all students. The remaining six universities tend to specialise; all teach in English. The number of Turkish Cypriot students pursuing higher education has steadily increased since 1979. Then, only just over 100 Turkish Cypriots attended university in the North. The number today is over 9,000, and mirrors that in the Republic. In 2001/02 the percentage of Turkish Cypriot students studying in the North was about 36% of the total student population. Foreign students account for 7%, and the remaining 57% are Turkish. The total number of students studying in the North is nearly 26,000 and students from 33 countries attend the universities there. Overseas students come mostly from Turkey, and other Middle East countries. Most of the universities offer graduate studies leading to master and doctoral degrees.

As Koyzis (1997) indicates, European accession and the inevitable harmonizing within the European *aquis communitaire* will mean that the higher education sector

will have to examine these realities, which may result in repositioning the roles of the public and private providers. The prevailing argument is that higher education should be allowed to develop along the lines of free market pressures, which embraces the private as well as the public sector providers of higher education (although there appears to be opposition by some of those in significant positions of authority). This poses a dilemma for those private organizations that want to pursue university status, for they need the legitimacy of university status to compete both internally and internationally.

International competitiveness through clusters

Education has value. This might be intrinsic and/or in the more commercial models of education extrinsic accounted for in terms of human capital and takes the form of abilities and skills that lead to increased production and economic growth (Stiglitz, 1999). A formal higher education is becoming a perquisite for an increasing number of careers and occupations and because of this educational institutions are responding to a shift from a supply-driven to a demand-driven market. As Meyer suggests given a, 'dramatic increase in knowledge-rich companies, higher education institutions no longer enjoy the quasi-monopolistic position of the past' (2002, p.549). The extrinsic human capital link has become a justification for the expansion of higher education and produced an extensive literature that makes variously claims as to the strength of the link between higher education and productivity and higher wages (Blundell *et al.*, 2001; Kane & Rouse, 1995; Trostel *et al.*, 2001). A comprehensive higher education review is that of Chevalier *et al.* (2002). For our study we adopted the human capital model in our discussion of higher education for it provides the transfer medium to discuss clusters in education and clusters in industry. Our concern here is not the intrinsic value of higher education, which we support, but how institutions of higher education could better provide students in national, regional and global markets with a wage incremental definition of the worth of their education resulting from attendance at certain higher education institutions. The discourse used is that of the economists where human capital is the consequence and justification of state investment and capital accrued is reflected in the wages it can attract. We will assume this perfect relation in our discussion and the type of education it would encourage. However, we recognize that wages fail to reflect the full value of the capital accrued for it fails to reflect the full extent of the benefit which firms enjoy when the workers have a higher education degree (Chevalier *et al.*, 2002). This surplus value accrues to firms often for no financial cost or obligation and is, in our view, a scandal of state education that is avoided in private institutions.

The case for treating higher education as a business is evident as state systems embrace managerialism and performativity that have become the dominant educational business philosophy (Readings, 1996; Ortmann, 2001). This is currently illustrated in the case made by the UK Government in their recent White Paper *The Future of Higher Education* (2003). In particular, the emphasis is on research excellence leading to viable economic returns development through elite 6* research departments. It is also seen in the emerging models of corporate universities for instance (El-Tannir, 2002; Prince & Stewart, 2002), which might well be a form of such higher educational institutions as will be the private universities built on a derivation of the Humboldt model. More generally, we see higher education responding in ways close to Latchem & Hanna's (2001) suggestion that alongside the traditional universities growth will include institutions which are for-profit, adult-centered universities (e.g. *Phoenix*), distance-based universities (*Open*), corporate universities *(McDonalds)*, university/industry strategic alliances (*Cambridge*/*Microsoft*), competency–based universities (teacher training in the UK) and global multinational universities (*Universitas 21*).

Many authors from the early studies of Marshall to Porter have studied industrial clusters. Many of these studies provide ample testimony to the importance of regional and national concentrations of particular industries and the link between them, innovation and growth. The mechanisms that give rise to clusters have been elegantly discussed by Porter in his books and papers (e.g. 1990, 1998a, 1998b) where he has suggested a paradigm for national competitive advantage which differs from that grounded in the economic philosophies of Smith and Ricardo. Although his analytic work is not without its critics (O'Shaughnessy, 1996) its application is still having an impact (see Jasmuddin, 2001; Neven & Dröge, 2001). Neven & Dröge (2001) compared the Porter's Diamond with two competing paradigms of flexible specialization (Piore & Sable, 1984) and collective efficiency (Schmitz, 1995). They conclude specifically, because of the dynamic nature of the Porter model, that it is the more robust of the two models to explain not only industrialized nationals but also the dynamic of developing nations. We thus adopt it, if not uncritically, here.

Central to its application is the notion of clusters and their productivity. Porter himself claims his articulation of this phenomenon had immediate impact on academics and practitioners (Aisner, 2002). He goes further to claim that its flexibility is the crucial ingredient and that the proximity of clusters allows this flexibility without formal ownership or legal relationships. Moreover, they foster the more productive use of inputs that requires continuous innovation and it is here that the environment outside the innovative company is important. The impact of globalization seems to have little impact on the benefits of location clustering (Porter, 1998). Clusters are 'geographic concentrations of interconnected companies

and institutions in a particular field. Clusters encompass an array of linked industrial and other entities important to competition. These include, for example, suppliers of specialized inputs such as components, machinery and services, and the providers of specialized infrastructure' (1998, p.78). For our purposes we will concentrate on the three ways in which clusters affect competition: by increasing the productivity of companies based in the area; by driving the direction and pace of innovation which is liked to productivity growth; and by stimulating the formation of new businesses, which expands the strength of the cluster. There is further evidence of the importance of clusters in a regional context. In a recent article Bergman (2002) presents some tentative data that indicates that clusters might 'play key supplemental roles in weak regions, providing important services, scale-effects and synergy found lacking in the region'. However he cautions, 'the value of cluster supplement to firms may diminish as regions develop, advance and agglomerate naturally such that adherence to a cluster may inhibit firms from becoming valuable members of a complex and sustainable region' (Bergman, 2002, p.19).

To summarize, the Porter model consists of four core determinants of a nation's competitive advantage. These determinants are:

1. The factors conditions – specifically specialized factors of production such as skilled labour (and hence education), capital and infrastructure;
2. Demand conditions – sophisticated and demanding domestic market which fuels competitively robust organizations;
3. The presence and/or absence of supporting industries where the forces of competition encourage survival and sustainability through an organization's creative innovative approach to market demand; and,
4. The national character of the firm strategy, structure and rivalry – career opportunities, innovative pressures and flexibility of regulation and capital markets.

Statistical analysis of the UK's Research Assessment Exercise with partial emphasis on Business and Management Studies

Some form of clustering is already evident in universities. It is not uncommon for departments within universities to attract well-qualified research staff to work with others of similar status in their field. This might encourage growth in certain programmatic activities (research, doctoral programmes, university-corporate centres, and so on) but it is done within institutions that might be geographically distant. It is the students who have to travel to enjoy the benefits of such innovation. The introduction of league tables in the USA and the UK not only direct student

application but also highlight centres of excellence in particular universities. The centres of excellence and their competitiveness are encouraged by the State through the REA and this tends to lead to grouping within universities, intra-clustering, whilst the clustering effect of increased competitiveness through innovation is difficult to detect. If we look at the RAE for UK higher education announced in 2001 (the example is based on the selected 5*[2] departments which applies to 11 % (up from 6% in the previous study, 1996) of 2001 submissions in the 69 subject areas used in the REA by higher education institutions in the UK, (http://195.194.167.103/Result/all/all.xls). The results reveal high quality research in a large number of institutions: 61 institutions have one or more 5* rated departments, and 96 have a department rated 5. A total of 173 institutions took part in the 2001 RAE. However, the concentration of these grades is within relatively few universities, with the majority receiving less than 5.

They also reveal that over 20% of 5* academics are concentrated in London and nearly 45% in the Oxford, Cambridge London triangle. From the HCFCE[3] data only six universities secure 10 or more departments with the 5* ranking. These are Cambridge, Oxford, Imperial, UCL, Kings Colleges (London), Manchester and Bristol and Birmingham. Of these Bristol is geographically local to Bath and the University of West of England but their combined 5* rating does not reach that of Oxford or Cambridge. In Birmingham a number of universities are grouped around the city, with Warwick responding well but with little impact on the Aston and the modern universities of Coventry and Wolverhampton. In the North West the grouping of Manchester UMIST Salford and Metropolitan all of which can boost 5* departments, might indicate clusters in the same way as London.

For the purpose of our project we selected from the 1996 and 2001 Research Assessment Exercise only Business and Management Studies (Unit 43) where 70 English universities rankings were considered. These universities were separated into two groups, on the criterion of regional proximity, with group 1 consisting of 13 universities: the London School of Economics, the University of Greenwich, the University of North London, Kingston University, the South Bank University, Birkbeck College, the City University, the Imperial College, London Guildhall University, Brunel University, Kings College, the London Business School, East London University. The remaining 57 universities were placed in group 2 and were used as the control group. Details of the Data Processing are shown in Appendix A.

As far as the independent sample t-test is concerned the *p*-value was 0.047, therefore the null hypothesis was rejected in favour of the alternative at the 5% level of significance. That is, the two mean improvement scores are unequal. Looking at the sample statistics, we observe a mean improvement score of 0.6044 for the London group and 0.1003 for the control group. Also, the raw difference

for the London group is 1.08 and for the control group 0.61. Note that the Levene's test for the equality of variances was not significant at the 5% level (p-value = 0.158) therefore the t-test was performed under the assumption of equal variances, thus making the test more powerful.

The 13 universities in the London area form a cluster with respect to improvement in the assessment of business and management studies. This is evident from the result of the independent sample t-test above. That is, the sample mean improvement score for the London group is 0.6044, much higher than the sample mean improvement score for the remaining universities, which is 0.1003. Another major indication that the 13 London universities may form a cluster with respect to the RAE assessment is that the coefficient of variation of their sample improvement score is 117% much lower than the coefficient of variation in the control group (830%). The high coefficient of variation in the control group may be an indication that within these 57 universities there may be one or more regional clusters. We conclude, albeit tentatively, that a cluster effect has benefits all the universities within the geographic are of London. We do not offer a reason for this and would point to the need for more information in this area.

How might this be done?

To be energized, the 'cluster effect' requires the interaction of a number of factors and the facilitation from a series of relevant infrastructural support measurers.

Our proposal is that a cluster of higher education institutions designed to develop human capital in these terms would create competitive advantage for the institutions that were clustered at a speed faster than more traditional development based on servicing geographic populations. The flexibility to act in such a way and with such a restricted notion of higher education leads, we believe, to clustering of private rather than a state controlled system.[4]

We, propose, therefore, if cluster-like characteristics are to be deliberately constructed, quickly, they are most likely to be found amongst private and technologically–orientated institutions[5] that are freer to seize and deploy assets than mass public universities, which are often obliged to locate and expand in peripheral areas in order to service geographic areas.

We acknowledge that this is a controversial position for some European countries although centrically not for some of the new members (Poland and Czech Republic for instance) where private education has helped achieve economic and education goals. However we suggest that current EU guidelines are based on the preservation of what is good about State education in a monopolistic environment

but applied in a market environment. For instance the role of quality assurance is not left to the market but to the interventions of State bodies. The Council of Europe has made provision for private education under Recommendation No R (97) 1 where private higher education is defined as:

> 'Institutions set up entirely or largely outside the existing public system of higher education, regardless of the legal status or personality of their founders. It does not refer to established institutions of a partly private-law character which are in practice already integrated within the national higher education system from the point of view of recognition, funding and where appropriate evaluation.' (1997).

The European Council of Ministers offers guidance. They suggest that the procedure for the approval of private higher education institution should by guided by the following criteria:

1. The legal protection of terms such as university and academic titles;
2. Criteria for the recognition of private institutions of higher education and their qualifications;
3. Quality Assurance;
4. Authorization of foreign institutions and programmes;
5. Language to be used for qualifications; and
6. Exchange of relevant information.

The law of the specific country in which the institution is created of course governs all of these recommendations. So it is the specific law that Cyprus must address so as to encourage high quality private institutions. It must also attend to making the environment more receptive to private institutions and do this without lowering the reputation of qualified students from the Island. If it does so then by combining the beneficial effects predicted by Stiglitz to be gained from 'pluralism and competition, often associated with openness' (1999, p.16), innovation and the growth of knowledge will be encouraged and clustering might achieve the gaols of the government.

Given that the structural objection to private and corporate higher education can be resolved we believe the follow requirements for the case of the promotion of tertiary education services in Cyprus could be itemised as follows:

a) The operation of a demand-supply chain of services to the main competitors in the education business game.

Such services, which can be linked through a vertically integrated flow, could relate to: the availability of education equipment, of library services, the availability

of academic texts, of scientific and professional magazines, the access to an efficient system of telecommunications and of computerized information, to the supply of furniture and other campus equipment, to printing and photocopying services, to student leisure facilities, to housing for students and faculty, to good international travel links etc.

b) *The presence of a creative competition among the main tertiary education institutions that would energize the demand-supply chain and improve its efficiency and responsiveness.*

The catalytic effect of the competition could be enhanced by the presence of both public and private Colleges-Universities but, more so, by the presence of local and foreign sponsored private competitors whose survival and growth could be related to the existence of a cost-effective supply chain.

c) *The existence of a characteristic(s) economic/business/social activity which could act as a cradle for the uniqueness of the intended major education enterprise of the cluster system*

Teaching and research activities pursued by higher education institutions could acquire a special relevance by reference to the uniqueness of the specific economic/business/socio-political environment within which they operate. For example, Cyprus with its reliance on a flourishing tourist industry, its strong financial and accounting sectors and its geopolitical positioning in an area which is not only a good potential source of students, but which is also characterised by conflict and survival could utilise these attributes through the introduction of special courses for conflict resolution and peace studies. These are examples upon which Cyprus could build a niche and its higher education reputation. Although, as Porter point out, these attribute are not a necessary perquisite for successful clustering they could form the basis of competitiveness in the delivery of educational service to the region and beyond.

d) *The provision of state provided support services and monitory/quality control systems.*

Facilities such as tax incentives that would encourage a 'cooperate to compete' business mentality among the education providers, the granting of student visas (including summer-work permits), the granting of work permits to visiting and other faculty, the operation of funding schemes for scholarships, for research and for student loans etc. would be some of the expected support services by the state. Other state involvement could be the operation of an accreditation system and of appropriate quality controls as well as the sponsoring of national campaigns to promote the education services.

e) *The existence of a 'friendly' public opinion about the social benefits to be derived by these business activities.*

The consequential effects of a growth in educational service might be of public concern, particularly could be the increased number of students, both local and overseas, which could cause an appreciable impact on the housing supply / cost of rentals as well as on the social customs. There are issues upon which the local population might tend to take a negative view under certain circumstances. Other novel influences on the public might be the difficulty of accepting the practical manifestations of the academic freedom in the search for truth, especially when the society takes a parochial view of what is right and what is wrong. Public opinion-formers would have an important role to play in the successful promotion of schemes for the development of the education services sector.

Conclusions

Cyprus has a geo-political advantage, has good climatic conditions, has a high level of English competency but lacks a reputation for higher education and has no natural competences in the provision of higher educational disciplines (say in tourism), and limited state funds. If it is to achieve its goal of educational excellence (and the Kelly report of 2002 shows the economic advantages of doing so) it will have to look to its own infrastructure to support new, corporate, specialist universities focused on the region and find ways of recognizing them which retains the international concept of the term universities.

There have been a number of recent studies (Collins, 2001; Duguet & Greenan, 1997) which show that clustering of firms near to universities are amongst the key indicators of success for industrial innovation but we have found little written evidence where education is the purpose of the cluster of firms rather than a concentration in one. To be able to concentrate in the sense of the new 6*6 research centres as suggested in the UK's White Paper on higher education based upon previous organic growth is unlikely to be an option to grow educational excellence in Cyprus. It does not have the critical mass, resources or the history to do so. However, the analysis we have undertaken makes, we believe, an interesting argument for the case of educational clusters as a viable strategy for the pursuit of Cyprus's stated goal of developing, within its domain, centres of educational excellence. Although we only provide indicative arguments and these mainly grounded in the Cyprus, we believe there is sufficient equity in our argument to warrant further investigation and research.

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Notes

1. The character of the university is international rather than Greek for, as Persianis (1999) observes, a university after the Greek model would be almost redundant for Greek Cypriots who could easily attend universities in Greece.
2. 5* = Quality that equates to attainable levels of international excellence in more than half of the research activity submitted and attainable levels of national excellence in the remainder (REA definitions).
3. This is now held on the HERO website.
4. We recognise the implications of state policy on private college as suggested by Thompson & Zumeta (2001) and Zoghi (2003) and deal with them in the final section of the paper.
5. This insight was offered in a private correspondence with Professor Bergman.
6. As proposed in the UK government's White Paper *The Future of Higher Education* (2003).

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Appendix A

Data Processing

In the RAE the 70 universities were rated as 1, 2, 3a, 3b, 4, 5 and 5*. These scores were recoded from a low of 1 to a high of 7 for each year. Their score in 1996 was subtracted from their score in 2001 and the raw difference was observed. This raw difference along with their potential for improving their 1996 score was combined to compute the 'improvement score' for each university as shown in equation (1) below:

(1) Score of improvement = raw difference - (7 - score in 1996) ÷ 7.

Note that the division by 7 was necessary in order to standardize the effect of potential for improvement.

For example, if a university had a raw difference of -1, it was penalized by more negative decimal points if the score in 1996 was lower since the potential (room) for improvement was higher thus there was missed opportunity.

If the raw difference for a university was 0, then a university with a 1996 score of 1 received a score of for improvement, one with a 1996 score of 2 received a score of for improvement etc. That is the more the space for opportunity the higher the penalty. Finally a university with a 1996 score of 7 received a score of 0 for improvement, thus not being penalized at all for not improving, as there was no room to do so.

On the other hand, all universities that had a positive raw difference achieve a positive improvement score. For example, if a university had a raw difference of +1 with a 1996 score of 2 it was rewarded with an improvement score of, one with a 1996 score of 3 with, etc. Thus the higher the score in 1996, the lower the room for improvement hence the higher the reward.

Table I below presents the effect of equation (1) for computing the standardized improvement score inside each cell. Only the cases that appear in the data are mentioned.

TABLE 1: Standardized Improvement Score

Score in 1996	1	2	3	4	5	6	7
1	-0.857	0.143	1.143	2.143			
2	-1.714	-0.714	0.286	1.286	2.286		
3			-0.571	0.429	1.429		
4			-1.429	-0.429	0.571		
5					-0.286	0.714	
6					-1.143	-0.143	0.857
7						-1	0

Hypothesis testing was performed on the improvement score. Let be the population mean for the improvement score of the universities constituting the London group. Let be the population mean for the improvement score of the universities constituting the control group. Then we test versus. That is, under the null hypothesis, the mean improvement score of the two groups are equal, and unequal under the alternative. The independent samples t-test will be used at the 5% level of significance.

In order to use this test the data sets of the two groups should follow (approximately) the normal distribution. Indeed individual tests of normality for the data in the two groups showed that the assumption of normality was not rejected. Specifically, for cluster 1, since the sample size, the Shapiro-Wilk test was used. The p-value for this test was 0.527, therefore the assumption of normality was not rejected. In the control group, therefore the Kolmogorov-Smirnov test was used. The p-value for this test was > 0.2 hence the assumption of normality is not rejected at the 5% level of significance.