Regional Differences in Intelligence and per capita Incomes in Portugal

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Regional differences in IQ and per capita income are presented for five regions of Portugal showing that both are highest in Central Lisbon.

Key Words: IQ; Income; Portugal; Regions.

Several studies have reported that average IQs differ in different geographical regions of a country, and that these different IQs are positively related to per capita incomes. Typically, although not invariably, the capital city has the highest average IQ and the highest per capita income. The objective of this paper is to examine whether this is the case in Portugal.

Previous studies reporting regional differences in average IQ and per capita income have been published for the British Isles, France, the United States and Italy. The first of these studies was concerned with IQ differences in 13 regions of the British Isles in the mid-twentieth century (Lynn, 1979). It found that IQ was highest (102.1) in London and South-East England, and lowest in Scotland (97.3), Northern Ireland (96.7), and the Republic of Ireland (96.0). These regional IQs were positively correlated with per capita income at r = .73. They were also positively correlated with intellectual achievement indexed by fellowship of the Royal Society (r = .94), and negatively with infant mortality (r = -.78) (Lynn, 1979). It has been shown

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subsequently that these regional differences in IQ are strongly associated negatively with differences in stature (Boldsen & Mascie-Taylor, 1985).

Similar results have been found in France, where regional differences in intelligence were reported for the mid-1950s by Montmollin (1958). IQs were obtained from 257, 000 18 year old male conscripts into the armed forces, and mean IQs were given for the 90 French departments. The highest IQs were obtained by conscripts from the Paris region and the lowest by conscripts from Corsica. As in the British Isles, it was shown that these departmental IQs were moderately well positively correlated with average per capita income (r = .61), with intellectual achievement indexed by membership of the Institut de France (r = .26), and negatively with infant mortality (r = -.30) (Lynn, 1980).

An association between regional IQ and per capita income has also been reported in the United States. It has long been known that in the United States the populations of the northern states have higher average IQs than those of the South-East (Kaufman et al, 1988). This has been confirmed by McDaniel (2006) who has calculated the IQs of the populations of the American states and found that these are highest in the north-eastern states of Massachusetts (104.3), New Hampshire (104.2) and Vermont (103.8), and lowest in the southern states of Mississippi (94.2) and Alabama (95.7), and in California (95.5). The McDaniel (2006) average state IQs are positively correlated with gross state product per capita (a measure of per capita income) at r = 0.28. Finally, the same positive relationship between regional IQs and per capita income has been reported for Italy, where average IQs for 12 Italian regions range from 103 the most northerly region of Friuli-Venezia to 89 in the most southerly region of Sicily, and there was a correlation of r = .94 between these regional IQs and per capita income (Lynn, 2010). There was also a strong negative correlation of r = -.86 between regional IQs and rates of infant mortality.

The explanation for the association between regional IQs and per capita income is that individuals with higher IQ tend on average to earn higher incomes. Regions are aggregates of individuals, so this association is also present at the population level. The classical study of the contribution of intelligence to income was made by Jencks (1972) who estimated a correlation of $r = .31$ (corrected for attenuation to .35) between IQ and income for a white male non-farm American sample aged 25-65. He concluded that this is a causal relationship such that IQ differences make a significant contribution to differences in incomes. He also concluded that IQ has a heritability of about 50 per cent, and therefore that genetic factors contribute to income differences.

Jencks' conclusions have been confirmed by a number of subsequent studies in the United States (e.g. Bishop, 1989; Brown & Reynolds, 1975; Crouse, 1979; Herrnstein & Murray, 1994; Murray, 1997, 2002; Zagorosky, 2007; Zax & Rees, 2002), and also in Sweden (Zetterberg, 2004). An analysis of eight studies of the relation between intelligence and income concluded that the correlation is $r = .27$ (Ng et al, 2005). In a recent meta-analysis of 85 data sets drawn from the United States, the United Kingdom, Norway, Australia, New Zealand, Estonia, Netherlands and Sweden, Strenze (2007) concluded that in all studies the correlation between intelligence and income is .20, in the best studies the correlation is .23, and in 35-78 year olds the correlation weighted by sample size is .25. This meta-analysis did not include a recent study of a national sample in Britain in which a correlation of .37 between IQ obtained in children at the age of 8 years and the same individuals' income at age 43 was found for men, and for women the correlation was nearly as high at .32 (Irwing & Lynn, 2006).

The positive correlation between IQ in childhood and income in middle age suggests that IQ is causal to subsequent income. This has been confirmed by studies of

sibling pairs that have shown that siblings with higher IQs have higher earnings than their lower IQ brothers and sisters (Bound et al, 1986; Rowe et al, 1999; Murray, 2002). The use of sibling pairs controls for possible family and neighborhood effects that might affect both IQ and income. The likely explanation for the positive correlation between IQ and income is that those with higher IQs work more efficiently (Schmidt & Hunter, 1998) and can supply goods and services with greater value than those with lower IQs, and consequently can command higher incomes.

Method & Results

The BPR (Bateria de Provas de Raciocinio) is a Portuguese intelligence test in four sections measuring figural-abstract reasoning, verbal reasoning, numerical ability and practical ability (consisting mainly of items on mechanical aptitudes). It is scaled to give a mean IQ of 100 and standard deviation of 15. The test was administered in 2007 to a sample of school students in grades 5 through 12 drawn from representative schools throughout Portugal. Results of the age groups have been averaged to give IQs for five regions. These are the North, North Central, Lisbon-Central, Lisbon-Suburb, and South. North is north of the 41° line and comprises the following districts: Porto; Vila Real; Braganca; Braga; Viana do Castelo. North-Central is located north of Lisbon up to the 41° line and comprises the following districts: Aveiro, Miseu, Guarda, Coimbra, Castelo Branco, about 3/4 of the district of Leiria and about 1/3 of the district of Santarém. South consists of Algarve and Alentejo. Algarve is the southernmost region and Alentejo consists of the districts of Portalegre, Evora, Beja and parts of Setùbal and Santarém. Results for Lisbon are given for the central district and the suburbs.

Table 1 gives the numbers in the samples for the five regions, the mean IQs, the Standard deviations, and the per capita incomes in 2008, expressed as percentages of the average for the 27 countries in the European Community.

Thus, for example, the average incomes in the two Lisbon regions were 105 per cent of the European Community average.

Table 1. Means and standard deviations (Sd) for regional IQs and per capita income in Portugal.

Regions	N	IQ	Sd	Income
North	1957	99.9	14.8	61
North Central	851	98.2	14.3	65
Lisbon-Central	483	106.5	13.6	105
Lisbon–Suburb	1044	99.1	14.6	105
South	494	98.4	13.1	75

Discussion

There are three points of interest in the results. First, IQ is highest in Central Lisbon, where it is approximately 7.5 points higher than in the other four regions, where the average IQ is approximately 99. This difference is similar to that in the British Isles, where the average IQ in London and the South-East was found to be 8.1 IQ points higher than in Ireland, which had the lowest IQ. A similar result has been reported for France by Montmollin (1958), where the highest IQ was found in Paris. In the case of the British Isles and France, it was proposed that the explanation for the capital cities to have the highest IQs is that over the course of many generations there has been some tendency for higher IQ individuals to migrate from the country to the capital cities (Lynn, 1979, 1980). These higher IQ

individuals founded families who inherited their higher IQs and transmitted them to succeeding generations. The effect of this was to raise the average IQ in the capitals, and at the same time reduce the average IQ in the provinces. There is considerable evidence from various sources that migrants tend to have higher average IQs than non-migrants, probably because it requires a reasonably high IQ to migrate. For example, Maxwell (1969) reported that 17 per cent of a representative sample born in Scotland emigrated and these had an average IQ of 108. It is probable that in Portugal the high IQ in Central Lisbon is also a result of some tendency for higher-IQ individuals to have migrated from the country to the capital city over the course of many generations.

Second, as noted in the introduction, in the British Isles, France, the United States and Italy there are positive associations between regional IQs and per capita income. This is to some extent present in Portugal where the IQ and per capita income in Central Lisbon are both considerably higher than in the three provincial regions. However, there is an anomaly in Portugal in so far as in suburban Lisbon the per capita income is as high as in Central Lisbon, but the average IQ is the same as in the three provincial regions. We believe a possible explanation for this is that the average IQ of school students in suburban Lisbon has been reduced by the large number of mixed race immigrants from Brazil and other Latin American countries who have settled in suburban Lisbon in recent decades. The average IQ of mixed race mestizos and mulattos in Brazil has been given as 81 (Fernandes, 2001). The high average earnings are for adults aged between approximately 16 and 65, with an average age of around 45 and among whom there are many fewer immigrants.

Third, there is another anomaly in so far as per capita income in the south is higher than in the north and the north central regions, although the IQ is fractionally

although not significantly lower. This is attributable to the economic development in the south during recent decades consisting of the building of holiday villas, apartments, hotels and restaurants which has generated well paid employment, as compared with the north and the north central regions. This economic development has been largely along the south coast in the Algarve, where the per capita income is higher at 79 percent of the EEC average, than in Alentejo, the northerly part of the southern region, where it is 71 percent of the EEC average.

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