

## Barriers to entry and the self-regulating professions: evidence from the market for Italian accountants

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The exclusive privileges of corporations, statutes of apprenticeship, and all those laws which restrain, in particular employments, the competition to a smaller number than might otherwise go into them, . . . are a sort of enlarged monopolies, and may frequently, for ages together, and in a whole classes of employment, keep up the market prices of particular commodities above the natural price, and maintain both the wages of the labor and the profits of the stock employed about them somewhat above their natural rate.

Adam Smith, *The Wealth of Nations*, I:7

### 1. Introduction

The self-regulating profession displays a substantial discretion to restrict entry into the market; indeed, it is often successful in imposing additional requirements in terms of training programmes and human capital and plays an active role in the selection of perspective candidates. The rationale for that lies in the fact that active professionals should be better suited to establishing the educational profiles and to evaluate the quality of the applicant. Comparative evidence about legal, accountancy, and engineering professional services clearly indicates that this institutional arrangement is prevalent across countries; furthermore, legislation often allows the professions to operate in non-competitive regimes (OCDE 1995).

Starting from the seminal work by Friedman and Kuznets (1945), economists have raised the issue of whether these institutional barriers to entry were successful not only in preserving the average quality of the member, but also in raising the rate of return of the profession up to supernormal levels. In this case, self-regulation could limit competition within the industry and raise the concern of anti-trust authorities. Some studies have collected evidence that the American Medical Association restricted the supply of physicians by lobbying successfully to reduce the number of accredited medical schools (Curran 1993). In a related study, Becker (1986) has shown that

additional requirements tend to increase professional incomes and that states are more prone to being 'captured' the lower is voter participation in elections, and the higher is the level of education.

Some tests have been developed to establish also the welfare effects of admission policies; analysing in cross-section US states, Svorny (1987) has found a negative correlation between the number of physicians and the level of qualification imposed by regulation. Interpreting the former as a proxy for the equilibrium demand for professional services, a more restrictive regulation has reduced consumer surplus; indeed, consumers did not increase demand despite the higher qualification of operating professionals.

While the effects of input regulation have raised the attention of economists, quite surprisingly the economic literature about the impact on the competitiveness of the industry of admission rates is very limited. Professional boards generally display substantial control on the pass-to-fail ratio that may reveal a powerful instrument for manipulating the supply side of the market and generate undue economic rents. As Maurizi (1974) has shown, a large number of self-regulating professions failure rates appear to be correlated to prevailing economic conditions. Demand fluctuations indeed seem responsible for manipulative activity by the boards: admissions are restricted to respond to a decrease in activity or to prolong a period of high incomes.

The aim of the present paper is essentially twofold; first, we try to carry out a descriptive analysis of the Italian accountancy market. In this area the urge for quantification is compelling, since separate figures for the professional service market are not reported in national accounting statistics. Secondly, we build two different specifications of a dynamic panel data model for the demand for and supply of accountancy services, explicitly taking into account admission rates as crucial determinants for the equilibrium emerging in the market.

Two major stylized facts emerge from the descriptive analysis: first, the convergence in the last few years in incomes of the two professions operating with different licensing requirements, namely *Ragionieri* and *Commercialisti*; secondly, the existence of a substantial earning differential between the two professions despite the recent trends. We claim that the rate of entry, and in particular, the admission policy in the profession implemented each year by professional boards, provides some interesting insights to explain this evidence.

From an empirical analysis in a dynamic setting, we obtain the following results: first, lagged admission rates represent an important factor to explain professional incomes. In particular, we find a strong negative correlation between the two variables, confirming the view that institutional barriers to entry are successful in creating economic rents. Secondly, and maybe more importantly, admission rates are an endogenous variable and are deeply influenced by past levels of income.

Indeed, a negative correlation between admission rates and accountants' income might indicate that consumers are just paying higher prices for a more qualified service which is warranted by professionals with higher skills, namely those who survived the hard selection process. In this case, the anti-competitive effect of institutional barriers

to entry has to be weighted with the increase in consumer surplus due to the higher quality of the good exchanged.

Our findings provide some evidence that on average the admission policy by boards is more influenced by past market conditions than by the average quality of the candidate. Furthermore, despite our results being far from conclusive, we suspect that, where implemented, the quality-inducing policy via entry restriction has failed to restore efficiency to a market pervaded by information asymmetries.

The paper is organized as follows: Section 2 provides a descriptive analysis of the Italian market for accountancy services and characterizes the details of the institutional setting; Section 3 presents our specification for the market for accountants; Section 4 presents the empirical results of our panel data simultaneous equations estimation. Section 5 concludes.

## 2. The accounting profession in Italy

In this section we provide a brief analysis of the working of the market for accounting services over the period 1980–91. In Italy such services can be supplied by professionals from two official bodies (*Ragionieri* and *Commercialisti*). The main difference between the two concerns the length of the academic curriculum required to practise. In the period under observation, to become a *Commercialista*, after a four-year university degree in economics, one had to pass an examination controlled—to some extent—by representatives of the professional body. To enter the professional exam to become a *Ragioniere* one needed only three years of apprenticeship but no university degree.<sup>1</sup>

Once the professional examination is passed, the new professionals can enter the market without further constraints in terms of freedom of settlement which are not uncommon for other professions in Italy (e.g. public notaries). Moreover, excepting the above differences in terms of educational requirements, there are no constraints on either profession in dealing with specific groups of clients or in providing specific types of services. As a consequence, there are no functional differences in the market for the two professions such as those in England and Wales for solicitors and barristers.<sup>2</sup>

In this respect, the Italian market for accounting services represents a good setting in order to test the hypothesis according to which self-regulating professional bodies, which are given some discretion over the procedures to enter the market, use it more to establish and protect rents than to raise quality standards.

### 2.1. Trends in the two professions

The following analysis draws from two main data sets. The first is the Archivio delle Professioni built by INPS, the Italian state-owned company managing the compulsory pension schemes. The Archivio includes personal data and reported incomes of all Italian professionals from 1980 to 1991.<sup>3</sup> Over the period, the records for the two professions are between 20,000 and 37,000.

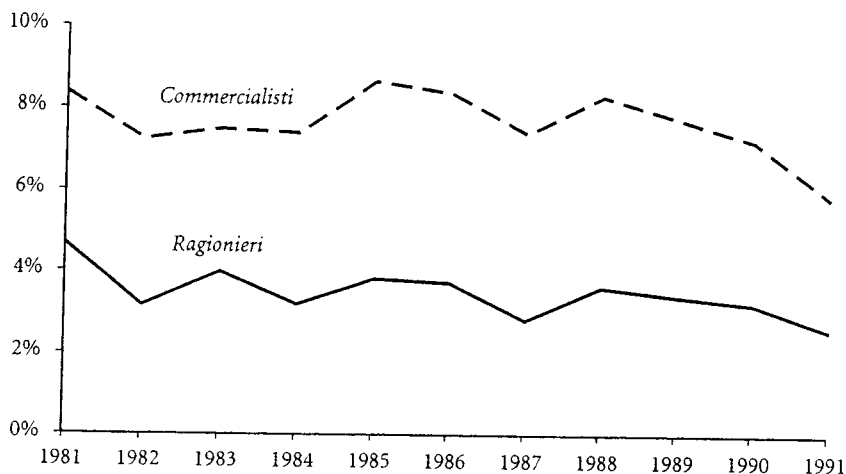


Figure 6.1. Rates of entry for *Commercialisti* and *Ragionieri*, 1980–1991

The second data set, ANCITEL, includes about 250 socio-economic variables at the city/town level (about 8,000 observations for each year). Such data are collected from several official sources such as ISTAT (the national agency for statistics), the Bank of Italy, the Ministry of Finance, other regulatory agencies, providers of public services such as telephone services, electricity, and so on. This second data set is used to better understand how the economic fundamentals of the market for accounting services are related with the economic environment in which they are provided.

The two professions under investigation are in the middle range of the Italian professions as for the number of registered members. To get a comparative idea, the largest profession is that of the medical doctors with some 300,000 registered members in 1991, followed by the engineers (about 100,000), and the lawyers (60,000). Much smaller professional bodies are the architects (9,000) and the public notaries (4,000).<sup>4</sup>

*Commercialisti* and *Ragionieri* started from a very similar membership in 1980 (approximately 10,000) with the *Commercialisti* slightly below the *Ragionieri*, but followed a different pattern of growth. By 1991, the *Ragionieri* reached about 15,000, while the *Commercialisti* went up to over 22,500. This difference is particularly remarkable if one recalls that the two professions supply the same type of services and that there is no further regulation on entry except the state examination where the professional bodies play a significant role. Moreover, among the rapidly growing service industries, the market for accountants would not appear to have experienced technological changes of such magnitude to justify such a rapid shift from one group of suppliers to the other.

For these reasons one is encouraged to look for institutional explanations of such a rapid growth in the proportion of accountants with a university education. There are two main factors which can explain such differences: First, on the supply side, Italy in

the late 1970s and early 1980s witnessed a large increase in the university population due to a dramatic increase in the supply of courses at the public universities characterized by very low fees. Therefore, to explain the relatively low proportion of accountants with a university degree at the beginning of the 1980s one can refer to a generally low share of the population with such a degree. Secondly, on the demand side, the average Italian firm size is much smaller than that prevailing in other developed countries and this, in its turn, had a negative influence on the demand for highly specialized accounting services (Barca and Visco 1992).

Taking into account these two institutional factors, however, one can only partially understand the differences in growth rates of the two professions (see Figure 6.1). While the reduction in the opportunity costs of a university degree can explain the higher growth rates of the number of *Commercialisti* through the 1980s, since university reform takes time to influence the market for professional services, it is less clear what the impact of the second factor is. Indeed, the Italian industrial structure has not experienced major changes in the average firm size during the period, so a structural shift in the demand for accounting services by firms is rather unlikely. As a very preliminary conclusion, one can explain the differences in the growth rates more in terms of supply rather than demand variables.

The drop in the rate of growth for the *Commercialisti* can be interpreted as the beginning of a period in which, after about 10 years in which the supply of accountants with a degree had grown to compensate the previous scarcity, the market adjusted to a lower equilibrium. Alternatively, the drop in growth rates can be seen as a signal of a greater control by the professional body over entry, perhaps justified by the growing competition in the market for accounting services. In comparison, the entry for the *Ragionieri* follows a much smoother pattern possibly for symmetric reasons: there had been no comparable shock on the supply side due to institutional reasons, and therefore there was less urge to take measures in order to restrict entry after a large inflow of new members.

## 2.2. Regional distribution of professionals

In this section we look at the regional distribution of the members of the two professions in order to see whether they are active in different markets although we have seen that there are no institutional differences in the services they are allowed to supply. This is because in Italy, the main areas (north, centre and south) have distinct economic features so that a different geographic distribution of the professionals may, to some extent, provide insights on their functional characteristics. To explore this idea, we assume that there are at least two components in the demand for accounting services. First a basic demand, expressed by individuals and small firms, and distributed uniformly across regions and, second, a demand for more sophisticated services expressed by larger firms or firms operating in international markets.

In Figure 6.2 the Italian regions are geographically ranked on the horizontal axis from north (left) to south (right). The more heavily industrialized northern regions

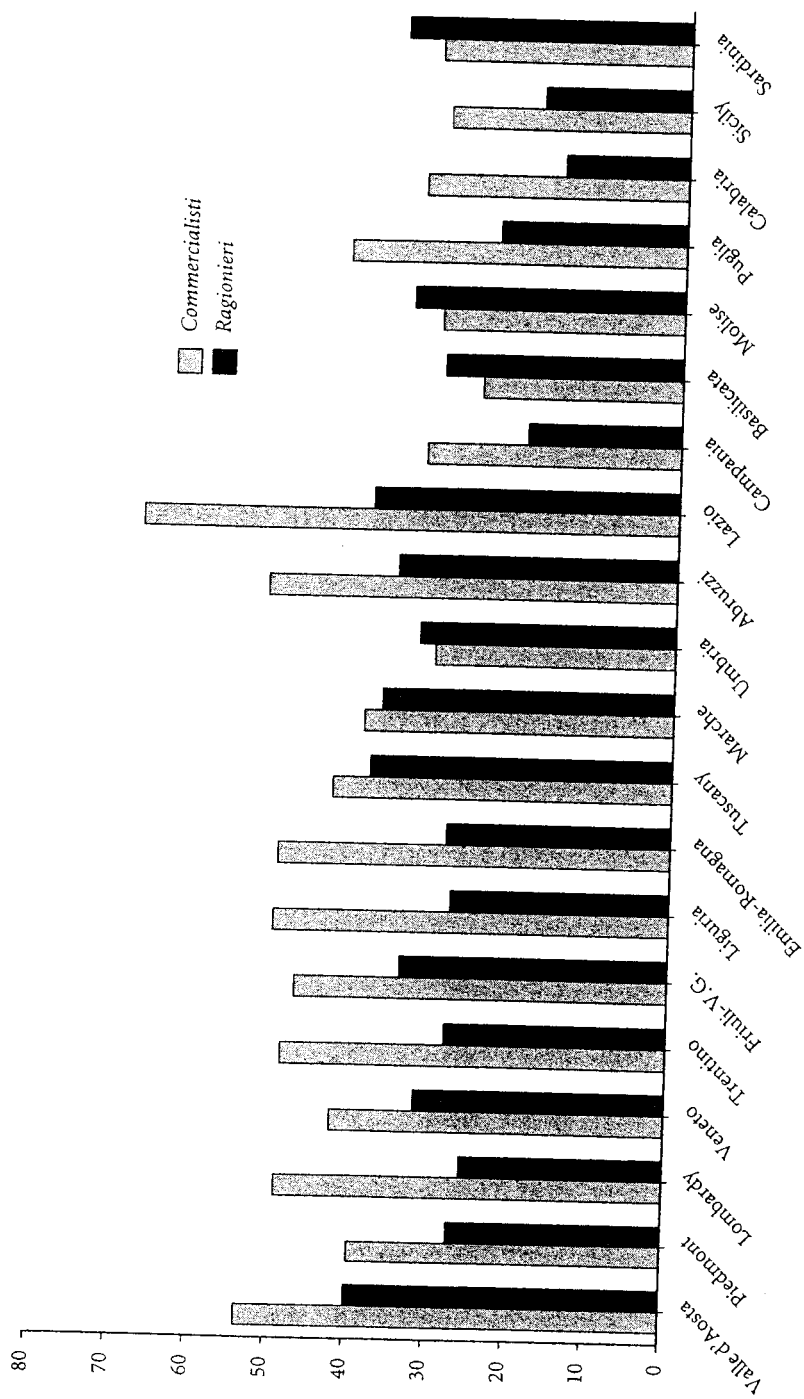


Figure 6.2. Density of Commercialisti and population ( $\times 10,000$ ) regional distribution, average values, 1980–1991

witness only a slightly higher density of *Ragionieri* than the southern ones. In this respect the highest density of *Ragionieri* is to be found in the regions of the centre which are characterized by a relatively large number of small firms.

A rather different picture emerges in the regional distribution of the *Commercialisti*. With the exception of Lazio—the region which includes Rome, and therefore the Ministries and the central bureaucracies—the more industrialized northern regions witness a much higher average density than the central, and especially the southern ones.

If one looks at the difference between the density of *Commercialisti* and of *Ragionieri* as a proxy for the size of the market for specialized accounting services, the data summarized in Figure 6.2 clearly support the idea that such a different market exists, and that is heavily concentrated in the northern regions.

### 2.3. The distribution of income

As we have seen, in the 1980s *Ragionieri* and *Commercialisti* exhibited quite different growth rates, with the *Commercialisti* increasing more rapidly than the *Ragionieri* and covering more specialized areas of the market. These two elements should have played some role in explaining the trend of the income levels for the two professions, shown in Figure 6.3, which are clearly symmetric to those of the membership. For the *Commercialisti*—whose number more than doubled in the period—the average income went up from 40 millions in 1980 to nearly 50 millions in 1991.<sup>5</sup> For the *Ragionieri*—whose membership grew less than 50 per cent over the same period—the average income went up from 23 millions to over 50 millions, overcoming in the last year that of the *Commercialisti*.

The comparative growth of the incomes for the *Ragionieri* is quite surprising even in comparison with other professions, and it can hardly be justified only in terms of the

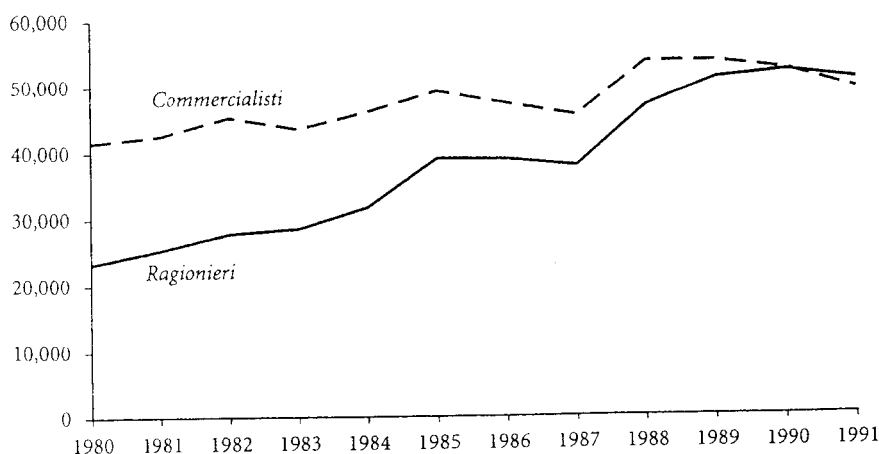


Figure 6.3. Average income for *Commercialisti* and *Ragionieri*, 1980–1991

particularly low rate of entry into the profession. Indeed, taking into account their lower level of human capital we assumed that the *Ragionieri* on average supply less sophisticated accounting services than the *Commercialisti* so that they might face problems in defending their incomes in a more competitive setting. As the opposite is the case, one is led to see these preliminary data as *prima facie* evidence that the degree of institutional control over entry is not irrelevant in explaining the profitability of the markets for professional services.

However, there is at least another institutional factor which must be considered in order to evaluate this inverse relation between rate of entry and rate of growth of income. In fact, the demand for basic accounting services is mainly expressed by small firms, which after 1983 have been subjected to a new fiscal regime that made it less profitable not to include the fees for the accounting services in the income report. On its turn this new incentive for small firms to ask for a regular fiscal receipt from the *Ragionieri* forced the latter to increase their reported income. Such change in the fiscal legislation would have little or no effect on larger firms who were given relatively strong incentives to report their accounting fees even before 1983.

The above hypothesis is at least partially supported by the data in Figure 6.3, since one of the sub-periods of more dramatic growth of the incomes of the *Ragionieri* occurs precisely in 1984 and 1985, that is right after the change of the fiscal regime. Moreover, that period is followed by two years of slightly declining incomes. However, a similar argument cannot be used to explain the upward trend observed in 1987. Therefore, at least for the late 1980s, a possible explanation for the differences in income trends of the two professional groups can be framed in terms of different admission policies.

#### 2.4. The regional distribution of incomes

Since the Italian market is clearly differentiated across geographical areas (see Figure 6.2) some relevant information may come from the analysis of the regional distribution of income. This is for two main reasons. First, the higher the average income is in a given region, the higher is the opportunity cost of entering the profession. Secondly, as we have seen, the degree of economic development seems to be related to the type and quality of professional services.<sup>6</sup>

During the period 1980–85, the income differential between *Commercialisti* and *Ragionieri* is still large on average and it is particularly wide in the more heavily industrialized northern regions. During the period 1986–91, such differences have virtually disappeared, and the catching up has taken place almost completely even in the northern regions. This seems to indicate that in the richest areas of the country, where most large firms operate, there has been a competitive edge to the profession characterized by a lower level of human capital. In this respect the convergence of incomes between *Ragionieri* and *Commercialisti* is not surprising only for the relatively short period in which it takes place, but also because it is more evident in those regions where one would have expected the opposite trend to prevail.



Owing to this lack of a convincing explanation for the above convergence, in the following sections we will try to identify other factors which cannot be observed at the regional level, but which might shed some more light on this effect at the city/town level. However, working on the results of the previous sections, at a less aggregated level, we will still take into account the rate of entry as one of the main candidates to explain the different trends in incomes.

## 2.5. Entry and the profitability of the local market

The plots in Figure 6.4 describe the relationship between the cumulative entry rate in local markets<sup>7</sup> and the average professional incomes in those markets. The local markets are sorted into four classes each including one quarter of the total markets from those with the lowest income level (1) to those with the highest (4). As one can see, for both professions, the analysis of the local markets confirms a rather neat inverse relationship between entry rate and income levels.

As for the *Commercialisti* the cumulative entry rate is 74 per cent for the lowest income class, and goes down to about 55 per cent for the highest income class. Moreover, while the median entry rate is well above the mean for the first three income classes, it becomes lower for the highest one. This indicates that by far the majority of local areas with the highest incomes is characterized by yearly entry rates below 48 per cent.

In Figure 6.4 one should also notice that the interquartile differential increases significantly going from the lower income class to the higher ones. This larger variance in the local markets with high incomes can be explained in terms of differences in the first part of the distribution of the entry rates. Indeed, in class 4 the first quartile is at a cumulative entry rate of 20 per cent, while in all other classes it is above 50 per cent. This means that the greatest proportion of local markets with very low entry rates is also characterized by high income levels.

A rather different picture emerges from Figure 6.4 looking at the income distribution for the *Ragionieri*. First of all, and not surprisingly, the rate of entry is on average lower than that for the *Commercialisti* in all income classes. In this respect, in classes 1 and 4 one half of the local markets has a zero entry rate, and in classes 2 and 3 one quarter respectively. However, the main difference with the *Commercialisti* is the lack of a clear negative relationship between incomes and average entry rates. This would point to a minor relevance of the entry conditions in determining the income levels in the local markets.

Summing up, the analysis of the entry-income relationship in the local markets partly supports the evidence at the regional and national level discussed in the previous sections. A negative relationship between the two variables is however less controversial for the *Commercialisti* whose incomes seem more heavily affected by the entry of new competitors. Recalling Figure 6.1, the convergence between income levels might be more due to the lack of control on entry on the part of the *Commercialisti* rather than a successful policy of entry restriction by the *Ragionieri*. Hence, the low rate of entry for the *Ragionieri* can alternatively be explained in terms of a reduction in the

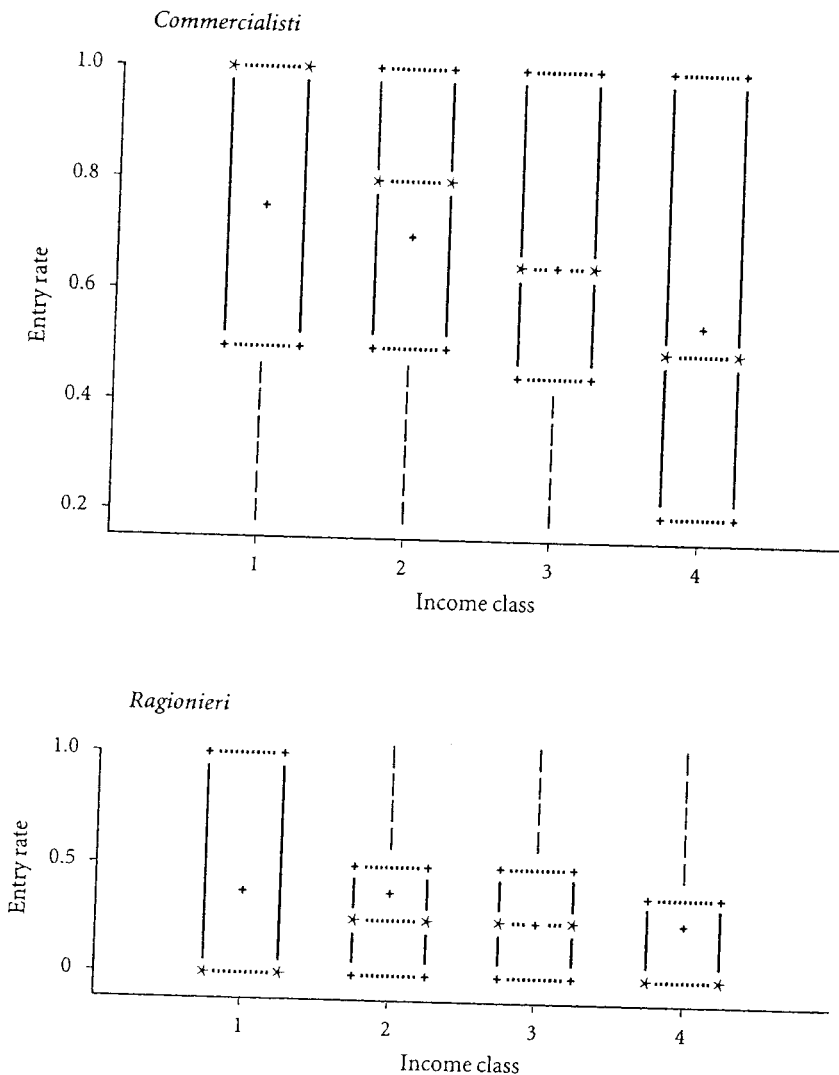


Figure 6.4. Cumulative entry rates and income in local markets, average values, 1980–1991

Notes: Some outliers have been removed from the plot to allow a relatively neat presentation. The distribution in the plot has not been otherwise modified. In Figures 6.4 and 6.5 there is a plot for each class of the variable described along the horizontal axis. Each box plot includes several elements describing the shape of the distribution of the variable described along the vertical axis:

- a central cross for the average value of the distribution;
- a lower dotted line with two crosses for the first quartile;
- an upper dotted line with two crosses for the third quartile;
- an internal dotted line with two stars for the median;
- vertical lines (|), zeroes (0), and asterisks (\*) for outliers further away from the average value.

number of candidates, preferring instead to invest more heavily in human capital anticipating a higher return and discounting a lower cost of higher education.

## 2.6. Age-earning profiles

The last section introduces the question of the expected profitability of the investment in higher education as a possible explanation for the different entry rates in the two professions. Hence, it becomes relevant to acquire more information about the differences in the earning profiles of the two professions.

In Figure 6.5 we show the distribution of incomes (along the vertical axis) in different classes of age. Such classes are built splitting the membership into four groups of

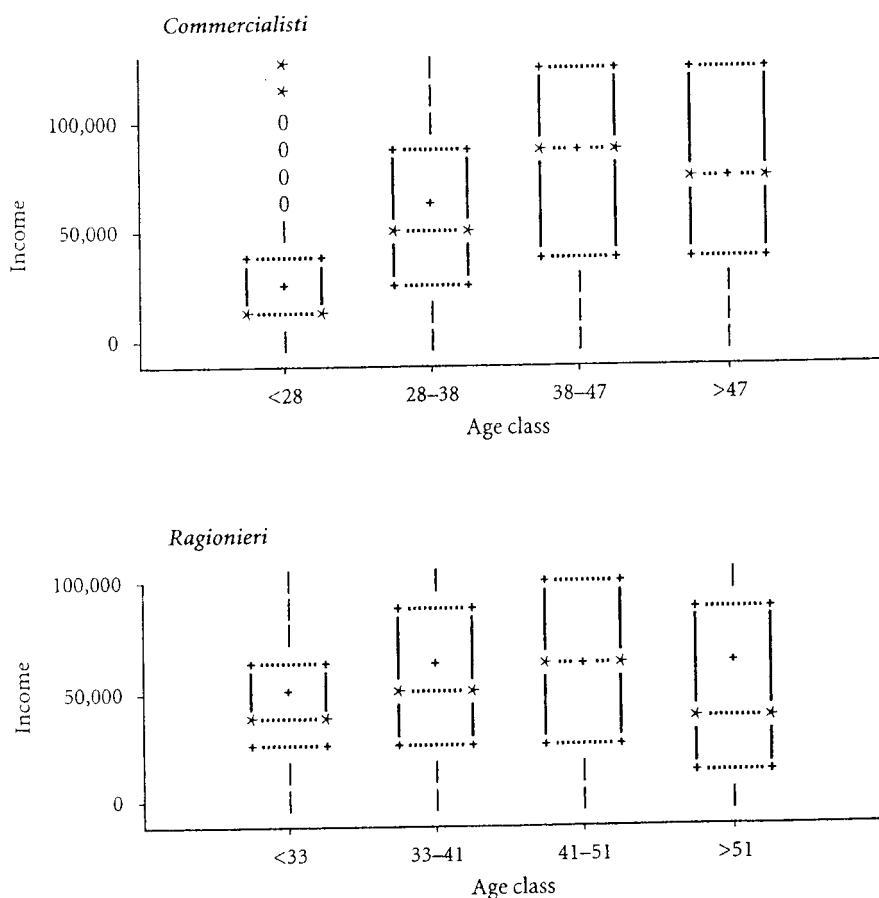


Figure 6.5. Age-earnings profiles, average values, 1980-1991

Notes: See notes to Figure 6.4.

equal membership, and attributing each member the age he had in 1986, the median year of the period. Accordingly, the first quartile of the age distribution for the *Commercialisti* is at 28, the median at 38, and the third quartile at 47, while the analogous values for the *Ragionieri* are 4 to 5 years higher with the first quartile at 33, the median at 41, and the third quartile at 51. The high entry rates of the *Commercialisti* have therefore a clear impact on the age structure of the membership.

In order to better understand how this different age structure influences the incomes at the local level, one can also observe in Figure 6.5 the income distributions for each class of age. For the *Commercialisti*, the average income in the first class is relatively low (about 25 millions), but it grows rapidly over 50 millions in the second, reaches the highest level in the third, and falls back to about 60 millions in the fourth.

To understand the differences between *Commercialisti* and *Ragionieri* one must keep in mind that for the latter the age classes are shifted forward by about five years. Taking this into account, one is not surprised to detect only relatively small differences in terms of average income comparing similar classes of age. However, if one looks at the dynamics of the income, one notices that there is a much steeper ascending trend for the *Commercialisti* than for the *Ragionieri* in terms of both means and medians.

This difference is coherent with the different level of human capital available to the members of the two professions. Indeed, the *Ragionieri* in class 1 (below age 33) already have considerable experience (they enter the market on average at 22), and therefore have had the opportunity to establish relatively strong relationships with their clients. On the other hand, the *Commercialisti* in class 1 (lower than 28) who enter the market on average at 26 have no time to establish the above relationships and therefore to reap the returns from the higher investment in human capital. When the *Commercialisti* reach approximately 35 years of age their average incomes are very similar to those of the *Ragionieri*, and when they reach 40 their advantage starts to widen.

Summing up, although the *Commercialisti* have a delayed entry due to the higher requirements in terms of human capital, the rate of return on such capital seem to be significant even in the first ten years of their professional life. It follows that the entry of new professionals in the market has a relevant negative effect on the average income of the competitors.

The variance of the income distribution differs significantly over the classes, so that the younger professionals witness an interquartile difference of less than 25 millions, while in the other classes the differential is over 50 millions. This reflects a process of specialization which takes place as the experience accumulates, and which explains why the variance for the *Ragionieri* in the first class is larger than for the *Commercialisti*. Moreover, the degree of asymmetry in the distribution is quite different across the classes with the first two with a much greater density of incomes towards the lower end of the distribution (the median is far below the average value). Only from the third class onwards do both professions assume a more symmetric distribution which signals that most members have reached a high degree of income stability.

In this section we have provided some comments on the evidence related to the earning profile in the two professions. Such evidence shows that while it takes about ten

years of professional activity for the *Commercialisti* to overcome the income levels of the *Ragionieri*, the former manage to reach relatively high income level in a short period after entry. This points to the fact that the entry of new professionals represents an immediate competitive threat for those already established.

In this respect, looking at the average incomes in the first eight years of professional life, for the *Commercialisti* one can notice a steady growth of the average value and a much steeper trend of the median.<sup>8</sup> This is due to the fact that in the first years of professional life few newcomers succeed in reaching relatively high levels of income while the vast majority experiences very low levels. Once the professionals get more established, due to the quasi normal distribution of talents and disutilities from work, the distribution of incomes tend to become more symmetric around the central values. Furthermore, as the mean–median differential gets smaller, the interquartile differential becomes larger possibly due to a progressive process of specialization and differentiation. Alongside this process, the first quartile grows at a much slower rate than the third quartile showing a consistent minority of new professionals who are left at the margin by the competitive process.

The new *Ragionieri* start from slightly higher income levels in the first three years of professional life and witness thereafter slower rates of growth. What makes the case of the *Ragionieri* particularly interesting is that the mean–median differential does not close up even after a relatively high number of years of professional life. This is mostly due to the very slow growth of the first quartile (a large group, characterized by very low income levels with respect to the mean of the professionals of equal experience) and points to the fact that this is a group of professionals who are working only part-time or are at the margin of the competitive process.

## 2.7. Admission rates for professional examinations

If the educational requirements are met, in order to enter the market for professional services a candidate must pass a state examination. Although the rules of such examinations vary across professions, on average the members of the adjudicating commission are representatives of the professional bodies (40 per cent), civil servants (40 per cent) and university professors (20 per cent). However, as many university professors, and sometimes even some civil servants are also, directly or indirectly, suppliers in the professional services market place, the professional bodies manage to keep a high degree of control over admission rates.

The evidence presented in the previous sections has focused on the link between entry rates and income levels as measured by the actual earnings reported by the new professionals. It is, however, clear that the rate of entry is determined by several economic and institutional factors, among which it is not at all easy, at this stage of the analysis, to single out the specific role played by the professional bodies in establishing higher barriers to entry.

In this respect, we were able to collect systematic data only for the *Commercialisti*, whose state examination is organized by the Faculty of Economics of the public

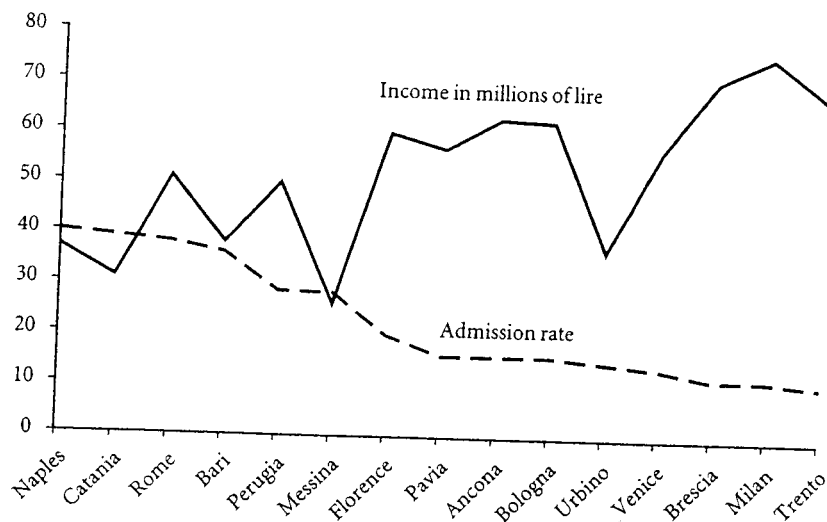


Figure 6.6. Average incomes and admission rates for *Commercialisti* in selected cities, 1984–1991

universities. The data refer to the period 1984–91 and to fifteen universities. Figure 6.6 shows the average admission rate for the professional examination of *Commercialisti* over the aforesaid period and the average income of the *Commercialisti* in the cities where the examinations take place every year.<sup>9</sup> In Figure 6.6 one observes a clear inverse relation between income levels and admission rates. The cities with lowest average incomes are those in which the admission rates are higher. Moreover, this relation becomes, on average, more clear-cut as the income levels rise, with only one exception.<sup>10</sup>

Looking at the trend in the admission rates between 1984 and 1991 one can see that the last year featuring relatively high admission rates is 1987. After that year, there is a clear decrease in the admission rates so that the average rate for the period 1984–87 is 29 per cent while the same average for the period 1988–91 is 24 per cent. We then conjecture that the professional boards are responding to the declining incomes by increasing the level of the institutional barriers to entry.

These data—although rather rough—make it difficult to accept *prima facie* the idea that such systematic differences in the admission rates over a relatively long period are purely the result of differences in evaluation procedures and/or in the performances of the candidates. This notwithstanding, the above evidence is difficult to interpret, because it is not clear in which direction one might establish a causal link between the two variables or whether there is a mutually reinforcing relationship. The higher income levels might be the result, among other factors, of a more restrictive entry policy to keep a high quality standard in the profession, and/or the admission rates could be seen as the result of a deliberate strategy of the professional bodies to keep those incomes high.

Even if we assume that there is a mutually reinforcing relation between admission rates and incomes, there are further interpretative problems. While it might be sensible

to assume that in areas where professional incomes are higher there are higher incentives to deter entry, it is not completely clear why professional bodies in low income areas should be less ready to defend their incomes by restricting entry. One possible interpretation is that the benefits from restricting access to the market are higher when the prospective candidates will swiftly reach a relatively high income level.<sup>11</sup>

The descriptive evidence shown so far repeatedly points to a strong negative relationship between rates of entry in the local markets and professional incomes. This is particularly true for that profession (the *Commercialisti*) for which one needs to invest more heavily in human capital and the earning profile rises rather rapidly after entry. Moreover, we have seen that the ability of the professional bodies to control entry might be a crucial variable in order to stabilize incomes at a higher level. On this basis, in the next sections, we will estimate a demand and supply model of the market for accounting services where we also treat the admission rates at the professional examinations as an endogenous variable.

### 3. The market for *Commercialisti*

We estimate two different econometric models for the market for *Commercialisti*; the first is a simultaneous equations model for the demand and supply in which admission rates in the profession are considered exogenous. The second specification explicitly takes into account the possible endogeneity of this variable in a three simultaneous equations system.

#### 3.1. A demand and supply model

The demand and supply equation for a professional service can take many forms; it is however customary in the literature to consider the number of professionals and their incomes as proxies for quantities and prices of professional services respectively (Pashigian 1977, Noether 1986, Kantor and Legros 1993). We therefore propose the following model:

$$y_{it} = \alpha_0 + \alpha_1 q_{it} + \sum_{j=0}^2 \alpha_{2+j} a_{i(t-j)} + \alpha'_5 X_{it} + \varepsilon_{it}, \quad (1)$$

$$y_{it} = \beta_0 + \beta_1 q_{it} + \sum_{j=0}^2 \beta_{2+j} a_{i(t-j)} + \beta'_5 Z_{it} + \eta_{it}. \quad (2)$$

Equation (1) represents the structural form of a semi-log inverse demand function, where  $y_{it}$  is the (natural) log of *Commercialisti* incomes,  $q_{it}$  the number of active *Commercialisti*,  $a_{it}$  the admission rates,  $X_{it}$  the vector of exogenous demand determinants, and  $\varepsilon_{it}$  the error term. Equation (2) describes the supply side of the market, where  $Z_{it}$  is the vector of exogenous supply determinants and  $\eta_{it}$  the error term;  $y_{it}$  and  $q_{it}$  are

therefore the only endogenous variables in this system. Subscripts refer to cross-sectional units observed at time  $t$ .

This specification deserves some comment. If accountancy services are a normal good, we would expect a downward sloping demand curve, but we do not have any *a priori* reason to conclude that it might not exhibit non-standard functional forms. The literature has stressed that in a market pervaded by information asymmetries prices convey information about quality; therefore demand functions might be upward sloping along some critical intervals (Stiglitz 1987).

The admission rates are a crucial variable to explain how institutional barriers to entry influence equilibrium quantities and prices in the market for accountants. Let us consider the supply side first; when candidates decide to train and to try the examination in a local market where boards are very restrictive in their selection, entrants know that this will require a career-specific investment. In particular, the high probability of failure, the extended period of study—given the several trials needed before success—will raise opportunity costs. Incumbent *Commercialisti* are therefore protected from competition so that incomes can rise to provide a fair return on an investment that is at least partly sunk. Under the assumption that restrictive Boards are benevolent institutions who strive to admit only highly skilled and educated candidates, and that after the examination there are no spill-overs among board jurisdictions, institutional barriers to entry may prove effective in providing quality and a premium to operating professionals at equilibrium.

As it has been stressed by Svorny (1987), for a given supply of *Commercialisti*, we should therefore find in the demand equation a positive relation between board restrictiveness and income. We believe that this argument can be more fully understood in a dynamic specification, so we have introduced two lagged values for admission rates.

The vector of exogenous determinants include socio-economic and anagraphic variables that are described in detail in Table 6.1. Instead, the vector of exogenous variables in the supply equation conveys information about the competitiveness of the local market in which professionals operate, namely entry, exit, and the standard deviation of incomes. An ongoing debate in the theoretical literature on professional services is trying to establish the effects of an increase or decrease in the number of competitors on fees. Obviously, the conclusions of competing explanations depend on the assumption about the prevailing regime within the industry. In monopolistically competitive regimes, the increasing monopoly model posits that when the number of professionals is larger, search costs increase; this makes consumers less sensitive to prices so that equilibrium professionals' fees increase too (Satterthwhite 1979). The target income theory claims that professionals may respond to an increase in competition by stimulating internally the demand for their services and then maintaining constant or even increasing levels of incomes (Evans 1974).<sup>12</sup> If instead some degree of intra-professional competition is displayed, entry will plausibly push downward incumbents' incomes.

In this respect, the standard deviation of incomes can be interpreted as a proxy for the prevailing market condition on the industry. If a market for a professional service



Table 6.1. Description of the variables

Balanced panel:

Cross-sectional units: 4228 towns/cities

Time period: 1984–91

Q <sup>a</sup>	<i>Commercialisti</i> operating at the town/city level
Y <sup>a</sup>	Reported <i>Commercialisti</i> incomes (natural log) (averages at the town/city level)
ADM <sup>b</sup>	Admission rate at the professional examination
BANK <sup>c</sup>	Bank offices over population (average in the time dimension)
POP <sup>c</sup>	Population at the town/city level (average in the time dimension)
PROD <sup>c</sup>	Industrial plants over population (average in the time dimension)
INCOME <sup>c</sup>	Per capita income at the town/city level (average in the time dimension)
CAREER <sup>a</sup>	Years after entry into the profession
AGE <sup>a</sup>	Years of age
AGE2 <sup>a</sup>	Squared years of age
STDY <sup>a</sup>	Standard deviation of incomes
ENTRY <sup>a</sup>	Per year percentage of new <i>Commercialisti</i> over the stock
EXIT <sup>a</sup>	Per year percentage of <i>Commercialisti</i> exiting the market over the stock
SEX <sup>a</sup>	Dummy variable taking value 1 for males and 0 for women
SOUTH <sup>a</sup>	Dummy variable taking value 1 for southern regions and 0 otherwise
1987	Year dummy

Sources: <sup>a</sup> Archivio INPS delle Professioni; <sup>b</sup> Università degli Studi; <sup>c</sup> ANCITEL.

is characterized by a low variation in incomes, the professionals in general sell an homogeneous good and, if similar technologies are adopted, one would expect price-taking behaviour. Vice versa, a high variance in incomes might be a signal of high product differentiation and of the presence of scattered monopolistic rents in the market. All this causes a substantial deviation from the ideal of a perfectly competitive regime.<sup>13</sup>

### 3.2. Endogenous barriers to entry

In the second model, we explicitly take into account the possible endogeneity of admission rates. In this specification, we therefore assume that boards, in establishing admission rates, do not only evaluate the average quality of the candidate, but also the prevailing market conditions. We propose the following three simultaneous equations model:

$$q_{it} = \alpha_0 + \alpha_1 y_{it} + \sum_{j=0}^2 \alpha_{2+j} a_{i(t-j)} + \alpha'_5 X_{it} + \varepsilon_{it}, \quad (3)$$

$$y_{it} = \beta_0 + \beta_1 q_{it} + \sum_{j=0}^2 \beta_{2+j} a_{i(t-j)} + \beta'_5 Z_{it} + \eta_{it}, \quad (4)$$

$$a_{it} = \gamma_0 + \sum_{j=0}^2 \gamma_{1+j} y_{i(t-j)} + \gamma'_4 W_{it} + \omega_{it}. \quad (5)$$

Essentially, equations (3) and (4) are the same demand and supply of the previous model except for the fact that we model a direct demand equation. Equation (5) provides our specification of the barriers to entry function; as customary in the industrial organization literature, barriers to entry are put in relation with the profitability of the market: where economic rents are present, one could argue that incumbents endeavour to preserve them.<sup>14</sup> Entry restrictions have a lasting effect on incumbents' income which is stronger if the profession operates in a monopoly regime and if boards can directly manipulate pass-to-fail ratios in response to market conditions. The vector  $W_{it}$  therefore includes the same exogenous variables about the competitiveness of the market that were present in the previous specification and other useful control dummies.

This model represents a logical step forward with respect to the simple demand and supply since it provides a more appropriate setting to evaluate the counterbalancing welfare effects of entry restrictions and to investigate the possible determinants of admission entry under an alternative behavioural assumption by the boards.

#### 4. Empirical results

Estimates of the first model are obtained by two-stage least squares. By the order condition, both equations are over-identified. We estimate therefore the reduced form of the supply equation and replace quantity with its predicted value in the demand equation. This allows us to obtain consistent estimates despite the correlation between endogenous variables and the error term.

We performed a plain ordinary least squares for unbalanced panel data in the first and second stage assuming constant slopes and intercepts. More sophisticated procedures that could be useful for testing the existence of individual or random effects could not be adopted since some variables are averages in the time dimension.

Table 6.2 contains the empirical results for the first model; our estimates confirm the existence of a downward sloping inverse demand curve in the market for *Commercialisti*; the contemporaneous and lagged values coefficient of admission rates are highly significant and negative; this indicates that institutional barriers to entry are indeed effective in raising accountants' income.

According to the theory we mentioned in Section 3.1, this indicates the existence of a substantial premium for the *Commercialista* operating in a regime where entry is limited by the boards. Supply being equal, consumers therefore seem willing to pay for the increase in the quality of the service.

Excluding per capita income and the number of banks operating in the cross-sectional area, socio-economic variables have the expected sign and are significant. As far as the anagraphic variables are concerned, seniority and male sex are positively correlated to income; using a quadratic expression for the variable age we capture the peculiarity of the age-earnings profile that we observed in the descriptive analysis in Section 2.6. Incomes are indeed increasing in age but at decreasing rates. The time dummy is not significant despite the observed upward trend in incomes in 1987. The

Table 6.2. Semi-log 2SLS estimates of accountants' income (t-values in parentheses)

	First stage equation	Second stage demand equation
Dependent variable:	Q	Y
CONSTANT	1.09338 (.259628)	9.36394** (178.070)
FITQ		-.408113** (-24.9610)
ADM	-.027008 (-.794723)	-.012433** (-15.9529)
ADM(-1)	-.856303E-02 (-.219600)	-.216172E-02** (-2.78711)
ADM(-2)	-.324451E-02 (-.104437)	-.325490E-02** (-5.31947)
BANK	.011888 (.130302)	.244692E-02 (1.35738)
PROD	.764622E-02** (18.2989)	.313313E-02** (25.0802)
POP	.649886E-04** (5.10614)	.265200E-04** (24.4024)
INCOME	-.213055E-05 (-.810252)	-.836044E-06** (-13.6495)
CAREER	.872897** (3.75720)	.411912** (29.8931)
AGE	-.191680** (-2.84835)	-.072768** (-20.6887)
SEX	-.498593 (-.266595)	.067862 (1.80330)
SOUTH	2.06695* (2.07253)	.217159** (5.38349)
STDY		-.296767 (-.833911)
ENTRY		1.73374 (.748770)
EXIT		-1.31815 (-.489219)
YEAR4		-.133349 (-.145918)
N	4228	4228
Adjusted R <sup>2</sup>	.808918	.522500

Key: \* statistically significant at the 5% level; \*\* statistically significant at the 1% level.

regional dummy instead is significant, but has the wrong sign. As a matter of fact, southern Italian accountants are characterized by far lower level of income with respect to their northern and central Italian colleagues.

As we stated in the introductory section, the boards display substantial discretion in the admission of new members to the profession. One can hypothesize that boards might take income levels into account to manipulate entry and therefore supply,

neglecting the average quality of the candidate as the primary variable during the selection. If admission rates were an endogenous variable, the estimates of the simple demand and supply model would be inconsistent.

In this direction, we have performed a Hausman (1978) test adopting the omitted variable interpretation; as Table 6.3 shows, we could reject the exogeneity of admission

Table 6.3. Hausman test for endogeneity of the admission rates (*t*-values in parentheses)

	First stage equation	Second stage demand equation
Dependent variable:	ADM	Y
CONSTANT	57.1968** (24.3452)	11.1354 (117.481)**
FITQ		-.168135** (-8.87088)
ADM		-.574993E-02** (-7.20050)
FITADM		-.054300** (-21.9680)
ADM(-1)		-.121690E-02 (-1.65335)
ADM(-2)		-.144871E-02 (-2.47448)*
BANK		.620272E-03 (.362785)
PROD		.128594E-02** (8.85782)
POP		.109492E-04** (8.75984)
INCOME		-.306058E-06** (-4.87040)
CAREER		.215127** (13.58847)
AGE		-.027113** (-6.90405)
SEX		.148490** (4.14331)
SOUTH		-.192954** (-4.53692)
YEAR4		-.950605E-02 (-5.56053)
STDY	-3.16514** (-13.6549)	
ENTRY	.638667 (.448497)	
EXIT	7.26263** (3.96456)	
N	4228	4228
Adjusted R <sup>2</sup>	.045343	.571474

Key: \* statistically significant at the 5% level; \*\* statistically significant at the 1% level.

rates at the 1 per cent significance level. We therefore turn to our second specification that explicitly takes into account the endogeneity of admission rates. Three-stage least squares estimates for the second model are reported in Table 6.4.<sup>15</sup>

In the demand equation, the equilibrium quantity of accountancy services are positively related to prices; this result contradicts the information of the previous model, where the demand function was downward sloping. If the services provided by *Commercialisti* are a search or credence good, consumers are not able to evaluate quality properly and tend to infer it from prevailing fees (Nelson 1970, Darby and Karni 1973). Therefore, where fees are higher, consumers tend to expand their demand since the information asymmetry is partially fulfilled. The supply equation is instead a conventional upward sloping function; as fees increase, a larger quantity of professional services will be supplied.

Now we turn to the main variable of interest of our analysis. Indeed, when treated as an endogenous variable in the system, admission rates result in a very interesting variable to explain the equilibrium quantities in the market for *Commercialisti*. First of all, we claim that the lagged values for the admission rates deserve closer attention; even if it is necessary to include contemporaneous values for that to be a proper simultaneous equation system, there are well-grounded economic reasons to discard the theory that admission rates could have an immediate impact on incomes and quantities. As far as incomes are concerned, it is not sensible to establish any economic effect between the rate of new admissions in one year and income in the same year; *Commercialisti* who have passed the examination cannot immediately generate any real effects on incumbents' incomes. The same argument applies for the quantity of accountancy services actually demanded. Once again, it is problematical that consumers perceive instantaneously any variation in the average quality of the professional. These effects are more tangible in the following years after some consumption activity has been carried out.

Given these *caveats*, we observe first of all a strong negative correlation between past admission rates and incomes in the supply equation; this indicates quite clearly that the institutional barrier to entry is successful in creating rents. On the same line of reasoning as the previous model, the rationale for this economic rent can be found in the higher human capital investment that is necessary to facilitate joining the profession in a local market where boards are quite selective. At this juncture, it is fundamental to establish whether the selection of candidates is not biased by other factors, namely the profitability of the local market or the competitiveness of the industry. A close inspection of the admission rates equation clarifies the fact that past incomes within the profession seem to be an important variable to explain the restrictiveness of the professional boards. The negative correlation we find between past incomes and admission rates indicates clearly that the profitability of the market at least partly explains the admission policy. Boards are indeed restrictive where incumbents enjoy economic rents; in addition, the sign on the standard deviation of incomes confirms the fact that less competitive markets exhibit lower admission rates in the market for *Commercialisti*.

It is however possible to find a rationale for this anti-competitive behaviour by the

Table 6.4. 3SLS estimates for the simultaneous equations model (t-values in parentheses)

*Demand equation*

Dependent variable: Q

Mean of dependent variable = 13.6414

Std. dev. of dependent var. = 48.717555

Sum of squared residuals = .178445E+08

Variance of residuals = 4220.55

Std. error of regression = 64.9658

R<sup>2</sup> = .242149

Parameter	Estimate	Error	t-statistic	P-value
ALPHA0	-241.774	49.4698	-4.88731	** [.000]
Y	-14.7089	6.67423	-2.20384	* [.028]
Y(-1)	24.2823	5.02220	4.83498	** [.000]
Y(-2)	17.1388	2.21827	7.72619	** [.000]
ADM	-6.02334	.874295	-6.88936	** [.000]
ADM(-1)	2.43034	.392997	6.18412	** [.000]
ADM(-2)	.958059	.162973	5.87863	** [.000]
POP	.816485E-04	.214303E-04	3.80996	** [.000]
INCOME	.164839E-04	.542170E-05	3.04036	** [.002]
PROD	.464306E-02	.757837E-03	6.12673	** [.000]
BANK	-.400079	.169252	-2.36380	* [.018]
SOUTH	69.9407	7.44177	9.39839	** [.000]

*Supply equation*

Dependent variable: Y

Mean of dependent variable = 10.6460

Std. dev. of dependent var. = .605971

Sum of squared residuals = 1804.67

Variance of residuals = .426837

Std. error of regression = .653328

R<sup>2</sup> = .177292

Parameter	Estimate	Error	t-statistic	P-value
BETA0	9.99688	.267852	37.3224	** [.000]
Q	.324292E-02	.228857E-03	14.1701	** [.000]
ADM	.042773	.013367	3.19992	** [.001]
ADM(-1)	-.016911	.589235E-02	-2.87005	** [.004]
ADM(-2)	-.997954E-02	.253180E-02	-3.94167	** [.000]
ENTRY	-.797864	.067773	-11.7725	** [.000]
EXIT	-.027319	.069472	-.393244	[.694]
STDY	.052238	.018807	2.77759	** [.005]
SOUTH	-1.01615	.096428	-10.5379	** [.000]
1987	.735596	.158539	4.63984	** [.000]

*Admission rates equation*

Dependent variable: ADM

Mean of dependent variable = 25.7264

Std. dev. of dependent var. = 15.1772

Sum of squared residuals = .122330E+07

Std. error of regression = 17.0098

Variance of residuals = 289.333

R<sup>2</sup> = .119708

Parameter	Estimate	Error	t-statistic	P-value
GAMMA0	183.726	17.2343	10.6605	** [.000]
Y	14.0539	3.13717	4.47979	** [.000]
Y(-1)	-21.3050	2.19443	-9.70867	** [.000]
Y(-2)	-4.44057	.842037	-5.27361	** [.000]
STDY	-3.64995	.501937	-7.27172	** [.000]
SOUTH	7.93829	1.35227	5.87033	** [.000]

boards; in fact the policy of creating and preserving rents may be functional to provide a relatively high return for those skilled *Commercialisti* who are the only ones admitted to the professional society. This argument does not seem too convincing; first, it is not at all clear that a policy of entry restriction should make consumers better off if their demand is upward sloping. Secondly, from our estimates the equilibrium consumption of services is lower in local markets where boards have been restrictive. The coefficient on lagged admission rates in the demand equation are in fact both significant and positive. One could therefore argue that the quality-inducing policy has not been successful in increasing consumers' willingness to pay for quality, as consumers are peculiarly inclined to infer quality by the prevailing fees.

Some other interesting results are apparent from our estimation; in the demand equation, with the exclusion of the number of banks, the vector of socio-economic variables is significant and has the appropriate sign. The regional dummies confirm some of the stylized facts that emerged from the descriptive analysis: in the southern regions, income levels are substantially lower and admission rates much higher. In the supply equation, more entrants reduce the profitability of the market, and this indicates that competition tends to dissipate rents. Finally, despite the relatively lower significance of the coefficient on standard deviation of incomes in the supply equation, we claim that a lower variability in incomes is associated with lower prices and higher admission rates. This result confirms that the competition operates in downsizing profits and that, where economic rents are not tangible, the boards are not concerned to restrict entry.

## 5. Conclusions

In this paper, we have provided a systematic study on the market for Italian accountants; this market deserves close attention since the same service is provided by two distinct professions (*Commercialisti* and *Ragionieri*) which differ in terms of input regulation. By law, only *Commercialisti* must have a university degree to be allowed to practise. The paper has shown the existence of a substantial earning differential over the professional life-cycle; we claim that this differential and the competitive threat exercised by new entrants and by the less-qualified *Ragionieri* lie at the basis of the admission policy administered by incumbent *Commercialisti* who are widely represented in the examining body.

Our empirical results indicate clearly that entry sensibly reduces the profitability of the market and that the institutional barrier to entry, namely the professional examination, is effective in preserving monopoly rents in the market. Furthermore, we have shown that the admission policy itself is endogenous and deeply influenced by market conditions. Indeed, the cross-sectional variance in admission rates all over the country can be only partially explained by differences in education or the professional ability of the candidates. Our analysis indicates that, once treated as an endogenous variable, admission rates are highly negatively correlated with past levels of income. As far as

Italian *Commercialisti* are concerned, this result casts some doubts on the view that professional boards are benevolent institutions who strive to preserve high quality standards of active professionals and posits the question whether it might represent a possible guideline for an intervention by anti-trust authorities.

This analysis can obviously be extended in many directions; first, it would be extremely interesting to collect data on admission rates for *Ragionieri*. A comparative analysis between the two segments of the market for accountants would allow any relation between the differences in admission policies and the profitability of the two professions to be put into context. In addition, it would be possible to estimate properly the degree of inter-professional competition and of substitutability between the services provided by *Commercialisti* and *Ragionieri*.

Finally, our estimates will probably be improved if we could have available a panel where all the variables were not averages in the time dimension; in this case we could test for fixed or random effects in the cross-section. Furthermore, it would be useful to carry out other diagnostics to test the robustness of our specification. We leave all this to further research.

## Notes

We would like to thank Roger Van den Bergh and Steve Magee for helpful comments and suggestions.

1. After the period under observation, the procedures for entering the market have been changed and made significantly more demanding. For the *Ragionieri*, to be admitted to the professional exam one now needs a three-year degree in economics, and a further three years of experience in a partnership with a registered *Ragioniere*. For the *Commercialisti* three years of apprenticeship are required in a partnership with a registered *Commercialisti*. In other words, for both professions the two requirements—university education and working experience—have now been made compulsory.
2. Although this is not the purpose of the present paper, the existence of two legally recognized professions in the market for accounting services, with different levels of human capital, might allow for a comparative analysis of the returns from the investment in higher education.
3. After 1991, the Archivio was dismantled because the data on the compulsory contribution to the National Health System, for which it was originally organized, passed under the administrative control of the Ministry of Finance.
4. The number of professionals in Figures 6.1 and 6.2 refer to those active in the market and paying a specific contribution to the health service. Such contribution is proportional to earned income.
5. Incomes are expressed in Lire 1992.
6. These data are available from the authors.
7. The cumulative entry rate is defined as the total number of new professionals who entered during the period over the stock of professionals at the beginning of the period. The local markets coincide with the administrative area of the town/city.
8. As a result, the income distribution, which starts off asymmetric with the average values



almost twice as large as the median, becomes progressively less skewed, so that in the eighth year of professional life the difference is less than 2 millions. These data are available from the authors.

9. Cities are ranked from the highest average admission rate (Naples) to the lowest (Trento).
10. Alternatively, one might say the admission rates are influenced by other factors directly or indirectly linked with the degree of economic development as there is a strengthening of the relationship as we move from the economically less-developed southern regions to the more advanced northern ones.
11. Such a cost might be approximated by the risk of being subjected to a disciplinary action or a civil suit on the part of one of the candidates, or the opportunity costs of refusing bribes.
12. For an empirical testing of increasing monopoly vs. target income theory see Pauly and Satterwhite (1981).
13. For an intriguing interpretation of the variability of fees in a market for experts in a Bertrand equilibrium, see Emons (1994).
14. As Stigler (1971) points out, regulations limiting entry are even preferred to direct subsidies, since these will be dissipated by competition in the market.
15. It may be useful to reiterate here that three-stage least squares involves the application of generalized least squares to the system under the assumption that error terms of each equation are correlated for identical cross-sectional units. Once the two-stage least squares parameters are obtained, the residuals of each equation are used to estimate cross-equation variance and covariances. In the third stage, generalized least squares parameter estimates are obtained (Pyndick and Rubinfeld 1981).

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