

Behavioral Assumptions and Management Ability: A Tentative Test*

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Abstract

The paper explores the consequences that relying on different behavioral assumptions in training managers may have on their future performance. We argue that training with an emphasis on the standard assumptions used in economics (rationality and self-interest) leads future managers to rely excessively on rational and explicit safeguarding, crowding out instinctive contractual heuristics and signaling a ‘bad’ type to potential partners. In contrast, human assumptions used in management theories, because of their diverse, implicit and even contradictory nature, do not conflict with the innate set of cooperative tools and may provide a good training ground for such tools. We present tentative confirmatory evidence by examining how the weight given to behavioral assumptions in the core courses of the top 100 business schools influences the average salaries of their MBA graduates. Controlling for the average quality of their students and some other schools’ characteristics, average salaries are significantly greater for those schools whose core MBA courses contain a higher proportion of management courses as opposed to courses based on economics or technical disciplines.

Keywords: evolutionary psychology, economics, management, contractual heuristics, rationality, self-interest.

JEL codes: A23, B41, D01, D87, M12, M51.

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1. Introduction

Economics has reached prominence within social sciences by using some of the methods of the physical sciences, such as a priori deduction and mathematical formalization. These methods have nevertheless led economists to assume that human beings are rational optimizers. Thus, while the status of economics as a genuine science has facilitated its application in intellectual problems that fell outside its original scope (Becker, 1976; Stigler and Becker, 1977; Lazear, 2000), its assumptions have long been subject to criticism for their lack of realism and the subsequent damage to the quality of predictions (Lester, 1946).

More recently, economics assumptions have been also questioned on a normative basis (Ghoshal and Moran, 1996; Ferraro et al., 2005). The main criticism is phrased in terms of a self-fulfilling prophecy, as exposure to self-interest assumptions trigger self-interested behavior. The argument is that behavioral assumptions in economics cause certain psychological biases that lead to opportunistic conduct. Confirming this conjecture in the lab, several authors have observed that students of economics display a greater selfishness (Carter and Iron, 1991) that inhibits cooperation (Frank et al., 1993, 1996), leads them to free ride (Marwell and Ames, 1981; Cadsby and Maynes, 1998) and even makes them more corruptible (Frank and Schulze, 2000). Although more selfish students could be self selecting into economics (Frank and Schulze, 2000; Frey and Meier, 2005), these results have been often interpreted as a symptom of how economics is subtly instilling in students how they should behave (Frank et al., 1993, 1996).

In the business arena, Ghoshal and Moran (1996) studied how economic assumptions could preclude cooperation within firms and hence condemn them as progressively uncompetitive. They argued that managers who presume their workers are distrustful will resort to hierarchical controls (fiat, monitoring, and piece rate pay) at the expense of alternative social controls. This should result in more compulsory compliance and work-to-rule over voluntary effort, as claimed by several authors in Organizational Behavior (Deci and Ryan, 1985; Pfeffer, 1994). Additionally, workers would also tend to reciprocate by developing more subtle forms of opportunistic conduct (Fehr and Falk, 2002; Vázquez, 2006), which would in turn make managers intensify supervision (Strickland, 1958). The process then becomes once again a self-fulfilling prophecy, since assuming self-interest and opportunism calls for managerial controls that stimulate the very same behavior they intend to prevent. In the end, “the cost of removing these controls will grow until it is no longer an option for the organization” (Ghoshal and Moran, 1996, 27).

Our paper complements these analyses on how assumptions in economics can diminish performance in two important ways:

First, we rely on recent findings in cognitive sciences that show the important role played in social interaction by what we name “contractual heuristics”: Innate decisional mechanisms which have been hardwired in our mind in order to interact with other human beings (see, for a summary, Arruñada, 2008). Our argument is that those trained in economics are indoctrinated into using calculative “hyperrationality” to make relational decisions, thus crowding out contractual heuristics. From this perspective, managerial training of an “inductive” type, by putting future managers in touch with real situations, does not crowd out contractual heuristics and may even provide a ground for effective learning. Inductive training would somehow provide a vicarious form of experience in which students learn to apply a contingent approach to

social interaction. This results in more successful transactions than when economic indoctrination leads them to always implement the same relational strategy (e.g., explicit safeguarding). Accordingly, we posit that managers will be more effective when they have been indoctrinated into ambiguous and even contradictory assumptions of human nature; a perspective that is more coherent with the existence of our contractual heuristics and is better represented in the diversity of management theories. By contrast, we argue that economics and even more technical disciplines, which use a uniform and rationalistic set of assumptions, risk inducing an analytical bias in future managers that does not improve and may even worsen their relational competences.

Second, we tentatively test this argument by showing with an econometric model how managers' salaries are affected on average by the relative importance that alternative behavioral assumptions had in their graduate education. As far as we know, this is the first empirical study to test the effect of alternative behavioral assumptions on performance. Notice that the particular controversy about whether opportunism is an appropriate assumption has mainly consisted of theoretical exchanges (Tsang, 2006), whereas most empirical work on the normative value of economics not only aimed at testing whether economic assumptions self-fulfill, but were also confined to experimental and case evidence (Frank and Schulze, 2000; Frank et al., 1993, 1996; Ferraro et al., 2005).

The paper is organized as follows: Section two presents the theoretical framework. We start by describing the role that cognitive science grants to our contractual heuristics with regard to human interaction. A brief account on how economics and management theories address rationality and cooperation follows. We use this background to build a testable hypothesis on the compatibility of both perspectives with the insights of cognitive science. This leads to the empirical part of the paper: Section three describes the data and presents the model, whereas section four discusses results and implications. Section five concludes.

2. Contractual heuristics in economics and management

2.1. The role of contractual heuristics in social exchange

Recent developments in cognitive sciences have dramatically improved our understanding of social exchanges by enlightening how we decide to cooperate and with whom. Experimental psychologists have proved that our minds are both very powerful and economical. Human beings err systematically in simple logical problems and assess probabilities poorly. This supports the view held by biologists stating that the human mind is economical, meaning it spends only those resources required to succeed in a given environment. If we did not evolve into scientists, able to comply perfectly with mathematical logic and the laws of probability theory, it was not because we lacked mental computing power but because it would have been wasteful. Our mind does not produce scientific solutions with general validity, but those solutions that are good enough to master the local environment. Cosmides and Tooby (1992) speak of an "ecological" rationality, which is economical not only because it is subject to constraints, but because it is well adapted to our ancestral environment. We can thus explain not

only why human rationality is bounded (Simon, 1957), but also why our brain is subject to continuous mental conflict (McLure et al. 2004): Our contradictory desires and beliefs are the result of evolutionary adaptation, since calculating the best tradeoff would have been inefficient in a context of scarce computational resources (Livnat and Pippenger, 2006).

The human mind is also very powerful, however, because it relies on instincts, modular decision systems which are better than mere calculative rationality on evolutionary recurrent tasks, such as recognizing objects, acquiring grammar or comprehending speech (Cosmides and Tooby, 1994) as conjectured by Simon (1962). The case of vision is revealing: The human mind displays an amazing capacity for computing, using several tricks or algorithms in parallel to perform the “inverse optics” needed to recognize forms. It is not a conscious process. In the same way, many other instinctive heuristics evolved to deal with evolutionarily recurrent stimuli in order to reduce the energy needed by our brains in a context of unreliable food supply. The nature of these heuristics can thus be considered to be efficiency driven, and in fact they are our “default mode”. Non-conscious processes in general constitute most of the electro-chemical activity in our brains (Camerer, Loewenstein and Prelec, 2005, 18).

The need for individuals to cooperate is also an evolutionary recurrent stimulus (just as recognizing or grabbing objects), and therefore involves instinctive solutions. Human interaction is normally prone to conflicts of interest because each cooperator may try to reap the benefits of cooperation without paying the corresponding share of the costs. It has thus been efficient for evolution to endow humans with innate contractual heuristics that help us discriminate partners by, for instance, signaling our commitment toward principled behavior or mimicking such signals. Cooperation also requires enforcement mechanisms, nevertheless, that rely to a greater or lesser extent on innate instincts. The simplest are linked to genetic relatedness, which grounds cooperation between relatives. The most complex are the instinctive systems that support cooperation between total strangers: Commitment strategies based on strong reciprocity (Fehr and Falk, 2002), the choice of partners upon instinctive heuristics designed to detect potential and real cheaters or generate empathic relations (Evans and Chang, 1998), a complex moral sense grounded on emotions that constantly extends its scope (Frank, 1988); a fondness of individuals for conformity with mainstream behavior in a group, as well as for discrimination against heterodox conduct or against those outside the group (Nicholson, 1997); the thirst for gossip (Dunbar, 1996); and a whole set of relational (mainly distributional) frameworks that may be triggered by certain environmental circumstances, like serious exogenous risk (Fiske, 1991; Tooby, Cosmides and Price, 2006). Summing up, our contractual heuristics allow us to distinguish “good” from “bad” trading partners before contracting, to detect cheaters afterwards and to commit ourselves emotionally to both behave honestly and retaliate against those who cheat us.

2.2. Rationality and cooperation in Economics and Management

Business schools transmit two main sets of paradigms to future managers on decision-making and human interaction. The first is based on economics, which entails a unique description of human nature by which all humans are of the same type: hyperrational and self-interested. The second paradigm is implicit in the management “jungle of theories,” and it conveys a plural and

sometimes contradictory nature of human beings. Although we do not aim to cover all the extant literature, we offer below a representative account of both perspectives.

Starting with economics, its most salient trait regarding human assumptions is its explicit, coherent and unified perspective on human nature. According to economics, individuals maximize their utility, guided by their preferences and tastes and restricted by the information available as well as by cognitive limitations. Decision-making is therefore considered a production process that is consequently subject to limited resources (Stigler, 1961). This instrumental or calculative rationality has been challenged by those authors for whom human beings “satisfy” and operate under conditions of “bounded rationality” (Simon, 1957; Williamson, 1975, 1985). Individuals would thus take decisions under the restrictions defined by their capacity to process information and by the complexity of the environment they live or work in. Although considering a wider set of costs complicates the analysis, there is little in mainstream economics against this idea.

Economics is also explicit and unambiguous about self-interest, which has generally been used together with an assumption of perfect information. Both assumptions define a framework within which individuals always keep their promises. However, when information is imperfect and unequally shared amongst participants, then the same assumption of self-interest leads to problems of non-fulfillment. This situation has been labeled “opportunism” after Williamson (1975), who defines it as “self-interest seeking with guile,” i.e., an extreme form of self-interest which leads the parties to go further than they would through a more innocent form of self-interested conduct (1985, 43-52 and 64-67). Other related concepts used in economics such as “asymmetric information,” “adverse selection” and “moral hazard”, however, could be interpreted as different manifestations of opportunism or, more exactly, of self-interested conduct in different contexts of limited and asymmetric information. The change with respect to the neoclassical model does not therefore refer to the assumed conduct or the decisional mechanism but to the structure of available information. On the other hand, Williamson also highlighted—in apparent contrast with conventional economics—that most people usually do what they say—or even more—without performing an ex ante cost and benefit analysis (1996, 49). He even acknowledged the relevance of “atmosphere” (1973), understood as reciprocity, dignity, trust, loyalty and other quasi-moral involvements. This acknowledgment is apparently aligned with Ghoshal and Moran’s critique (1996) on the negative effects that opportunism entails for managerial action. However, Williamson (1993a, 1993b) simultaneously observes no incoherence in emphasizing that contractual calculativeness is the sound strategy to design efficient governance structures in any type of transactions, and that its possible excesses could be solved through additional calculations. As he puts it, “once the excesses to which calculativeness is given are displayed and understood, the distortions can be anticipated and can thereafter be folded in at the design stage. A (more farsighted) calculative response to the (myopic) excesses of calculativeness thereby obtains” (Williamson, 1993b, 454).

In contrast with economics, the use of human assumptions by management theories is much more plural and implicit. There is a “jungle of theories” that hinders the identification of a single main perspective on rationality and cooperation. Managerial training within this jungle includes terms like “bureaucracy” and Taylorism, for instance, which instruct students on pyramidal authority, written rules, a clear description of job contents, specialization, impersonality or time and motion analysis. These and many other proposals conform the result of “rational optimizing thinking” when designing management structures and productive systems. There is consequently

an implicit message that indoctrinates students on the need to act rationally by adopting these practices. Simultaneously, however, other managerial theories like contingency or systems' theories (Pfeffer, 1982) tell the same students that our societies and organizations are not actually systems running towards a steady state in equilibrium. In contradiction with what they have just studied about Taylor or Weber, they learn that there is no optimum strategy or structure. They are furthermore taught that, in contrast with the implicit assumptions of Taylorism and Weberism, decision making is not mainly a "rational" process. Decision making could be actually subject to cognitive restrictions (Cyert and March, 1963) and is significantly driven by emotions (Argyris, 1957; Etzioni, 1988). Often such a diverse message on rationality is conveyed in the same management courses.

Similarly, the perspective on human interaction implicitly transmitted by management theories shows a high diversity that often leads to contradictory perspectives. Future managers learn from classics like Taylor, Fayol or Weber that piece rates, hierarchy and standardization are crucial not only to coordinate individuals but also to control their propensity to shirk. Conversely, they also learn from Human Relations Theory that individuals are influenced by social needs and not only by economic incentives, especially in advanced societies. The message is that piece rates and many of the bureaucratic features are "dehumanizing" (Etzioni, 1971), and therefore harm workers' motivation in terms of "disaffection" and "suspicion" (Dore, 1973). Treating workers productivity as if it was an engineering problem would therefore be a mistake. Humans could actually show a complex hierarchy of needs (Herzberg, 1968) that involve individual and collective motivations. The study of personality is thus very relevant (Hall and Lindzey, 1970) because human diversity makes generalizations difficult. And when it comes to foreseeing the opportunistic propensity of individuals, textbooks discussing intrinsic motivation (Ryan and Deci, 1985) and psychological contracts (Rousseau, 1989) warn future managers about the ambiguous consequences of their actions. The message, implicitly again, is that individuals are neither altruistic nor opportunistic; their propensity to shirk or to cooperate depends to a great extent on how they perceive they are being treated.

2.3. Hypothesis: managers are more successful than business analysts

The need to save the resources of our brains and adapt them to the environment has made us develop powerful heuristics to confront evolutionarily recurrent stimuli, not only in physical activities like grabbing an object or seeing it but in social interactions, when cooperating with others. Furthermore, in a context of scarce computational resources, it was efficient for our brain to maintain a certain level of internal mental conflict as our default mode (McLure et al. 2004). Making continuous optimizing calculations about the best tradeoffs would have been wasteful. Evolution has therefore made us live in a permanent quarrel with ourselves, leading us to different behaviors depending on the particular traits of the transaction we are carrying out, the characteristics of our partners, or the actual context in which we interact with others. In principle, we may lie, deceive or betray to further our long term interests. We are apt to easily fall into self-deception because in a world of walking lie detectors, believing your own lies is often adaptive. We even tend to unconsciously mimic basic feelings like anger, disgust, fear, joy, sadness or surprise to enhance our chances of cooperation with others. But at the same time and for the same reason, natural selection installed cooperation and generosity in our minds. Our

first ancestors who were friendly, charitable and generous “prospered not by their own calculation but because the feelings made it worth their neighbors’ while to cooperate with them” (Pinker; 1997, 406). We feel solidarity, sympathy, tolerance and trust toward not only our family, but also toward our “artificial relatives” whom we make by gathering information on who joins which groups or who resembles who. And when our potential partners are total strangers, we use other contractual heuristics based on guessing intentions.

Results from agent-based simulations and experiments are consistent with this view, as they repeatedly refute the existence of a unique human type who behaves in a more or less honorable manner when confronting cooperative dilemmas. Simulations have proved that populations often contain groups of individuals with different prevailing strategies of interaction (Dugatkin and Wilson, 1991; Aktipis, 2004). Several experiments have also confirmed that some individuals in a population may be normally principled, whereas many others tend to free ride and shirk. All of them may change their behavior, however, under certain circumstances, and in fact individuals do not cluster perfectly (Burton and Obel, 1988; Nagin et al., 2004; Kurzban and Houser, 2005). The typology of human nature is therefore more complex and ambiguous than Hobbesian or Rousseauian simplifications embrace, and the arsenal of cooperative tools in our minds is much more diverse and sophisticated than mere calculative rationality.

Cognitive sciences thus provide three interrelated reasons as to why training in economics can be bad for leadership posts.

First, economics indoctrinates future managers in a *single human nature* characterized by its proclivity towards opportunistic conduct. This means that our contractual heuristics, which have been evolutionarily developed to avoid cheaters and foster cooperation, are ignored by economics. Spreading the news of a single human nature therefore makes the selection of contractual heuristics superfluous for human interaction, when it is indeed our main resource to individualize each relational framework and take decisions accordingly.

Second, economics recommends agents to align their incentives through a *calculative and safeguard-optimizing* contractual process. In a world of instinctively rational individuals with a different capacity for commitment, however, this approach disregards the fact that our innate ability to screen cooperators ex ante may be more efficient than to perform an explicit safeguarding activity. More importantly, regardless of whether our screening heuristics succeed, carelessly intensifying our safeguarding efforts may still interfere with less rational, more emotional and definitely less conscious interaction mechanisms. Transaction costs increase and trade opportunities are jeopardized. This is what happens, for example, when calculative safeguard-building activates automatic cheater detection mechanisms or hinders the development of empathy relations. Parties who exhibit opportunistic assumptions thus risk being classified by potential partners as opportunistic, and may trigger non-cooperative first moves even in repeated games (Forges, 1992).

Finally, emphasis on rationality and optimization inclines future managers to believe that any course of action that does not violate any law or contract is valid and can therefore be freely implemented if profitable. In so doing, such managers tend to overlook relevant issues such as their partners’ desire for procedural and distributive justice (Cohen-Charash and Spector, 2001; McFarlin and Sweeney, 1992) which, despite being subject to cultural differences, also reflect hardwired instincts related to our conformity with mainstream ideologies, gregarious behavior, drive for status, loss aversion and many others (Pinker, 1997, Nicholson, 1997). The fact is that

people care deeply about being treated fairly, and even managers depend on the approval of many others to be successful. By stressing strategies and reforms in an absolute sense, economics disregards how our hardwired instincts make us perceive them. This deteriorates relational exchanges by making managers think that the goodness of a strategy is measured only by a narrow account of expected monetary gains that forgets about “social feasibility”. In more concrete terms, economic training inclines managers to explicitly apply cost and benefit analysis to issues that, for most people, should not be considered on such an economic basis or should not be *explicitly* considered on such a basis; issues which are inside an expanding and intuitively shared “moral circle” (Singer, 1981; Brown, 2000). The consequence tends to be a tendency for these analysts to inadvertently signal themselves as antisocial. They display their arguments without realizing that, on the eye of their observers, simply considering certain tradeoffs is immoral (Tetlock et al., 2000). In addition to the signaling issue, explicitness in assessing certain trade-offs generates hostility because it undercuts most people’s self-image and social identity as moral beings (Fiske and Tetlock, 1997), and when this apparently innocuous scientific exercise is performed by others with whom we might be interacting, it is often perceived as a direct attack on one’s central beliefs.

The economic message thus ignores the benefits of our instinctive rationality and collides with our innate contractual heuristics by provoking distrust among exchanging partners and confusion as to what good *ex ante* strategies are. The result is an increase in transaction costs that delays, deteriorates, or even frustrates economic exchanges. Alternatively, we put forward that the managerial jungle of theories, based on rather plural (sometimes even contradictory) comprehensive and implicit behavioral assumptions, is more coherent with what cognitive science shows about human behavior and therefore is more successful for managerial practice.

Using *plural assumptions* encourages managers to give a more considered weight to opportunism (based on case and individual-dependent assessments) and thus allows them to unconsciously treat each exchange as a unique transaction that may require unique decisions and strategies. Management theories thus allow our contractual heuristics to play a relevant role in social exchange. The use of plural behavioral assumptions in management courses is also reinforced by greater reliance on the case study method. Students have to discuss—rather than calculate—which conducts and decisions are more suitable in a particular situation, so they are confronted with the full array of human traits. They are forced to focus on facts, but do so while interpreting factual situations and real human characters according to their own instinctive judgment (Greenhalgh, 2007). Cases do not afford anything like a “solution,” and students know that the situations they will have to navigate in the future will be different and will require attention to the full sets of facts and characters. As summarized by Rubinstein (2006, c8) when criticizing the mathematical bias of economics, class discussion of case studies fosters more *comprehensive thinking* about real life problems and instills in students the need to balance conflicting interests.

By contrast, most economics teaching concentrates on a series of mechanic models in which human behavior is simplified under the assumptions of rationality and self-interest. Students of economics thus learn specific modeling mechanisms to reach an optimal “solution” to particular problems, instead of focusing on the methodology (identifying the relevant problem, choosing justifiable assumptions, developing testable implications, exercising caution when applying the analysis). In a survey about classroom experience in economics courses years after leaving school, Allgood et al. (2004) found that 40% of graduates in economics and most graduates in

business and other majors agreed that economics courses were more lecture-based and less discussion-based than other courses. Growing concern about the decrease in economics majors and in enrollments in economics has intensified the effort to make classes more entertaining by complementing the traditional “chalk and talk” methodology with economic “games” and experiments. Apparently, things have not changed much in the evolution of masters in economics, however, except for the larger numbers of admission requests and some other issues related to degree requirements or women’s participation (McCoy and Milkman, 2006). Understandably, it has been concluded that what the new strategies have achieved in teaching may be interpreted as a different mix of inputs within the existing production function (Knoedler and Underwood, 2003).

Furthermore, when it comes to normative proposals on how individuals should behave, the *implicit nature of management recommendations* fosters the use of our adaptive contractual heuristics. By not stressing a type of “correct” behavior, managers indoctrinated in managerial theories can use their contractual heuristics to assess what fairness entails in each particular transaction and act accordingly. On the contrary, the normative explicitness on human behavior inherent in economics makes the whole contractual process a matter of ex ante costs and benefits. This is the reason why instructing managers explicitly on self-interest and opportunism may be positively right but normatively wrong: It advises individuals to perform a sophisticated fine-tuning of hypocrisy that may lead to distrust. In the same way, instilling explicitly in managers such messages as “it pays to be honest”—as in some Business Ethics courses—might also be harmful: it would not only lead to naïve conducts and decisions but also encourage individuals to calculate the ex ante contractual costs and benefits of each exchange, therefore resulting again in intense safeguarding activity that may delay, modify or block the transaction.

From this perspective, whether management theories are right or wrong about human nature does not help much in assessing whether they serve for properly instructing future managers. What matters most is their effect on the ability of future managers to employ their adaptive contractual heuristics. False beliefs can be useful when they trigger adaptive behavior. For example, regardless of whether believing in God is a scientific, rigorous deduction, beliefs in a punishing god may constitute an effective way of enforcing a moral code without relying on external enforcement. Similarly, when interacting with people capable of identifying potential cheaters, self-deception may allow a cheater to pass undiscovered, and this may compensate for other costs imposed by self-deception. By the same token, de-emphasizing opportunism may therefore be adaptive *even if wrong* if it helps people to signal their cooperative nature and contract more often with cooperators. Expectations of cooperation can thus become self-fulfilling. This is specially so if the automatic mental heuristics for the detection of cheaters rely on implicit and complex models of human nature, as seems likely.

To sum up, management theories convey a less dogmatic, more open and more descriptive perspective on human nature than economics. They are therefore more coherent with what cognitive sciences tell us about individuals’ behavior, which is characterized by the presence of diverse, inconsistent and even contradictory instinctive heuristics for social interaction. The notion of individuals as rational optimizers is therefore a misleading parable for managers. We have developed an instinctive rationality that makes individuals unconsciously harness a different type of behavior for each situation; sometimes being honest, sometimes being opportunistic and sometimes even through self-deception. The plural, implicit and sometimes even apparently incongruent approach of management theories is thus better adapted to the

nature of the cognitive problem of cooperation; a problem characterized by the intrinsic contradiction between selfishness and altruism, trust and suspicion, teamwork and shirking. All these arguments lead us to propose the following hypothesis: *Managers indoctrinated in rationality and opportunism are less successful than managers whose training encourages the use of their innate contractual heuristics.*

3. Data and analysis

We test our hypothesis by examining how the market evaluates the influence of the alternative behavioral assumptions used in MBA programs on the professional success of their graduates. We measure professional success as the average weighted salary of each school, controlling for several other factors. Data on the presence of different behavioral assumptions in each MBA program has been compiled by reviewing how each of their core courses was described in the programs' websites during the month of February 2003. Particularly:

The performance of each MBA program was estimated through its graduates' average weighted salaries three years after graduation from the 2001, 2002 and 2003 Financial Times (FT) surveys. These figures were given in US dollars and measured as the average "salary today" adjusted for salary variation between industry sectors (*Salary*). Using salaries right after graduation should lessen the relevance of other alternative measures of success like non-monetary rewards.

Reliance on two different behavioral assumptions is measured through the relative weight of each assumption in the courses that form the mandatory core of each MBA curriculum. In particular, the *Economics* variable represents the percentage of core MBA courses that assume rational and self-interested agents, such as courses in Economics, Strategy and Finance (Rocha and Ghoshal, 2006, 586), while the *Management* variable is the percentage of core MBA courses grounded on more plural and often benign assumptions, under which human conduct sometimes reflects opportunism and sometimes responds to altruistic or at least group-beneficial motives, such as Human Resources Management and Organizational Behavior. We have separated *Ethics* courses from the management field because they recommend a more explicit and univocal strategy to confront exchange: "Being honest is profitable". As explained in the theoretical section, this could make the contractual process a matter of ex ante calculation of costs and benefits, as in economics. Results do not change, nonetheless, regardless of whether explicit ethics courses are or are not included with other management courses. Finally, technical courses that do not reveal a prominent behavioral assumption are taken as default. This is the case, for example, of Statistics, Data Analysis, Financial Accounting, Operations Management or Writing Skills. We take *Technical* courses as the default variable (the sum of *Economics*, *Management*, *Ethics* and *Technical* courses is 100).

Classification of the grouped courses was based on the course content, as described in the respective MBA web site and after reviewing the recommended literature of the course where appropriate. Whenever a course's description revealed that it presented or was based on economic theory, it was classified as *Economics*. Whenever a course's description emphasized behavior that could involve self-interest but also altruism, intrinsic motivation or emotions it was classified as *Management*. The variable *Ethics* measures the weight of Business Ethics or a

similar compulsory course in the MBA core. Whenever a course's description accentuated quantitative methods, regulations, technical skills or was an applied project, it was classified as *Technical*. Finally, if a course's description revealed the presence of more than one of the categories, it was broken up into the different categories according to the relative weight of the assumptions in the description of the subject matter. We also include the relative size of the MBA core through the variable *Core*, which measures the percentage of core courses in the total number of courses required for graduation.

To better identify the effect of the curriculum, the models control for several potential factors related to the inputs, process and environment of each school, trying to measure the influence of students' quality, the quality and quantity of the training provided by the MBA and the possible effect of local markets:

Students' quality is considered both in terms of their previous work experience and potential academic performance. Previous work experience of the students is measured through the number of months they had been working before entering the MBA (*Experience*). Their academic quality, on the other hand, is proxied through the average score obtained in the Graduate Management Admission Test (*GMAT*). Notice, however, that the use of this variable as provided by the FT could generate an endogeneity problem in our model. We expect higher *GMAT* scores to be associated with higher salaries, but we also expect that good students, those with the best *GMAT* scores, will tend to have gone to the best schools. Therefore, their average quality will also depend on the school's average expected salaries. This is why both variables are treated as endogenous. The second equation in our model seeks to obtain the predicted values of *GMAT* according to several explanatory variables. These predicted values of *GMAT* are the ones actually used in estimations (3) and (4) explaining average salaries.

The value added by the MBA is measured through several variables: the total cost of the MBA in tuition and living expenses, the duration of the program, the size of the students' body at each school, the homogeneity of students, and the quality of research. The annual budget recommended for attending the program (*Budget*) includes tuition fee and living expenses in US\$. Social interaction, often considered a value for this kind of program, both in itself and in terms of future professional networking, is proxied via the total number of full time MBAs in the school (*Enrollment*). The homogeneity of students (Table A.1) is measured by an index (*Homogeneity*), built as the first principal component of three variables measuring the dispersion of students with respect to their *GMAT* score (*Gmatdisp*), age (*Studentage~p*) and previous work experience (*Workexpdisp*). Each of these three variables was calculated by dividing the difference from the lower to the upper 80% bounds of the corresponding score by the average score for each school. The impact of *Research* is measured with an index obtained through principal component analysis (Table A.2) from three indicators given by the *FT* survey. These indicators are: The percentage of faculty with a doctorate (*Faculdoct*); a ranking based on the number of doctoral graduates from the last three academic years, with additional weighting for those graduates taking up a faculty position at one of the top 50 schools in the 2002 survey (*Doctorr*); and a ranking of research based on a rating of faculty publications in 40 international academic and practitioner journals, with points accrued to the school at which the author is currently employed and points adjusted by faculty size (*Researchrank*). *Research* is standardized to have mean zero and standard deviation one.

The effect of local markets is controlled by the schools' geographic area, which is considered through two dummies, *USA* and *Europe*. Both take value one if the school is located there, and zero otherwise. Finer geographical proxies do not modify our results.

Finally, three additional variables are used as instruments to tackle the endogeneity problem caused by GMAT: the quality of placement services, the gender position (Table A.3) and the internationalization of Business Schools (Table A.4). The performance of placement services is measured with the *Placement* variable, i.e., the percentage of 1999 alumni that gained employment with the help of career advice. Given that in the 2003 survey this data is presented as a rank, the variable is recoded as a reverse ranking to make higher numbers represent better quality. Gender position is measured through an index (*Feminine*) built as the first principal component of the percentages of female faculty (*Womenfacul*), female students (*Womenstud*) and female board members of each school (*Womenboard*). Similarly, the *International* index combines the percentages of foreign faculty (*Intlfaculty*), foreign students (*Intlstudent*) and foreign board members (*Intlboard*), as well as indexes of students' mobility (*Intlmobility*) and international exposure (*Intlexperr~k*), plus the working languages required (*Languages*).

Table 1 presents the main descriptive statistics of the variables and shows that the dataset combines data from two main sources: the *Financial Times* 2003 survey of the best MBA programs, mostly based on 2002 data,* and the profiles of each program in the *Business Week* database†. For a few observations, part of the data was collected from the programs' websites at the beginning of 2003. Table A.5 presents the correlations among the variables in our models.

Regarding the econometric analysis (Table 2), we have estimated two models with two specifications each. The first one is a simple OLS estimation of the average salary earned by the graduates of each MBA as a function of behavioral assumptions (*Economics* and *Management*), and the rest of the control variables. The second model, which renders similar results, tries to deal with the possible endogeneity caused by GMAT through a system of simultaneous equations estimated using three-stage least squares. Thus, we propose in the second equation that the average GMAT score depends on the school's average salary, the performance of its placement services, its research quality, student homogeneity and the position of the school in terms of gender and international background.

We posit a simultaneous and reciprocal influence between *GMAT* and *Salary*. The higher the average GMAT of each MBA program, the higher the potential of its students to achieve outstanding results after they graduate. Yet, since average salaries are made public through sources like FT, MBAs whose graduates are successful in terms of remuneration will also attract more and better students, among whom the Business Schools will choose the most qualified (those with a higher GMAT). We therefore argue that there is a matching of schools and students. This is the justification for the presence of *Salary* as the dependent variable in the first equation and as an independent variable in our second equation. Other variables included in this second equation have already been described: the performance of the placement services, student

* See "Financial Times MBA2003. The Top 100 Full-Time MBA Programmes," *Financial Times*, January 17, 2003 (<http://specials.ft.com/spdocs/FT3543AD2BD.pdf>, accessed February 15, 2003).

† See details at "B-Schools: MBA Rankings & Profiles," *Business Week Online*, (<http://www.businessweek.com/bschools/02/index.html>, accessed June, 7, 2003). The ranking was released on October 21, 2002 (Merritt, 2002).

homogeneity regarding GMAT, age and work experience, the performance of schools' research, gender position and internationalization of the faculty. All five indices used (*Research, Homogeneity, Placement, Feminine and International*) are standardized to have mean zero and standard deviation one.

4. Results and discussion

Results confirm our main argument because the greater the weight of Management courses the greater the average salary of the school. For 1% more weight of management in the MBA core, MBA graduates earn around 1,000 USD more. However, no significant relation appears between average salaries and the percentage of Economics and Ethics courses. Thus, the model supports the hypothesis that MBA graduates who have taken a higher percentage of management courses are better educated for business than their colleagues who have taken a higher proportion of subjects based on economic and technical assumptions, as well as explicit courses on ethics (no significant difference is noted between economics, ethics and technical courses).

We have checked that results do not significantly change with alternative measures of success taken from the FT survey, such as the extent to which alumni fulfilled their goals, the degree to which alumni recommend recruitment from each school, and several other measures that were calculated three years after graduation: the simple average of salaries, the percentage increase in salary, the rate of return for each dollar spent and the degree to which alumni have moved up the career ladder. Furthermore, even if our key independent variables (*Management, Economics, Ethics and Technical*) measure the weight of different behavioral assumptions in the core of the MBA, they may be proxying for the weight of such assumptions in the whole of the MBA program, to the extent that schools defined their cores partly as a function of the power of the different departments and disciplines, which will also influence their ability to recruit professors and offer elective courses.

Results with respect to the size of the MBA core are also interesting. Table 2 shows that the *Core* coefficient is significant and positive, which suggests that MBA programs with a higher proportion of core courses yield a better education for future managers. The mandatory content of the curricula is therefore consistent with the presence of conflicting interests between students and professors. Professors, who are interested in specialized and scientific courses, tend to impose cores that are too small, probably leading to incoherent learning, and too many courses that rely on allegedly more scientific, but managerially unproductive, behavioral assumptions. In the light of this result, recent switches to smaller cores by some top schools, such as Chicago and Stanford, may be misguided.

Other control variables yield the expected results. Both *GMAT* and *Experience* augment the success of the MBA program. To put it bluntly, smarter and more experienced students "teach" their classmates better. *Budget*, which measures the cost of the investment in each MBA, also shows a positively significant correlation with average salary, which proxies the gross return from the investment. *Enrollment*, on the other hand, suggests there is a positive relation between the average salary of the MBA program and its visibility in the labor market (through brand positioning, graduate associations, social interaction during the MBA and networking resources for the future). Finally, graduates from the USA and Europe also earn more than their

counterparts on Asian and Australian MBA programs. As shown in Table 2, graduates from the USA earn between 12,099 and 13,844 more dollars than Asian-Australian graduates. European graduates, in turn, earn between 9,339 and 11,322 more.

The estimation is less clear about three variables: *Homogeneity*, *Duration* and *Research*. Although the *Homogeneity* of MBAs in terms of GMAT, age and experience exerts a small influence on the education of future managers in the OLS model, its coefficient becomes insignificant in the 3SLS model. More interesting is the finding that both the duration of the MBA and the quality of research in each school show no significant coefficients in any specification. Within our framework, it could be argued that a lengthier education can enhance the analytical capacity of graduates but adds little to managerial and leadership abilities. The insignificant coefficients of *Research* are consistent with an interpretation that the market is asking MBA programs to generate the proper competences, capacities and abilities in their graduates, regardless of whether the information they receive is at the edge of scientific knowledge. However, asking MBA teachers to concentrate on teaching necessarily reduces the time they dedicate to their research projects, thus harming their scientific curriculum (Trieschmann et al., 2000).

Our interpretation, in line with our arguments above, is that because management theories are less dogmatic, more open, more descriptive and sometimes even inconsistent among the different branches, they are more coherent with what cognitive science shows is normal human behavior: diverse and contradictory. This interpretation is consistent with the previous finding that managers trained in business schools that rely more on the case study method also earn more money (Tracy and Waldfogel, 1997). The significant difference between the parameters of our *Management* and *Economics* variables is also consistent with the argument put forward by Ghoshal and Moran (1996, 39): By assuming the worst, managers indoctrinated in economics could be bringing out the worst in economic behavior.

Notice that emphasizing the role of heuristics in the education of managers does not necessarily mean that contractual safeguards are trivial in supporting exchange. It does mean that managers with training in organization theories not only appreciate the value of contractual safeguards but, more importantly, can discriminate in which relational frameworks they should apply them. It is not a question of being emotional for small stakes and rational for larger ones. We actually use contractual heuristics in both because the first challenge is precisely to know when to be calculative and when not. Thus, if important contracts were just a question of contractual safeguards, corporate deals would not rely on face-to-face interactions of key managers, as they do. This is the case of large mergers and acquisitions, for instance, which are triggered or frozen by personal intuitions and discussions among the top management, but supervised by dozens of specialized lawyers and economists to whom these top managers delegate most of the calculative and farsighted design of the contract. Contractual heuristics and contractual safeguards can therefore be complementary in many cases. Anyhow, no technological or contractual innovation has substituted the crucial relevance of personal interactions, where the complex mix of cooperation instincts and cheater detectors may ignite, intensify or break any contractual relation.

Also, our argument suggests that indoctrination in rationality and self-interest may be harmful in jobs requiring a full set of human abilities, but not in all jobs. A curriculum loaded with economics might make MBAs graduates more analytical, which can be an excellent skill in many technical positions where, even if personal interactions with others play a role,

performance hinges more on one's specific stock of quantitative tools and capacity to carry out objective calculations (as in, for instance, production planning, financial assessment, tax optimization, cost accounting, logistics or market research) than on one's personal interaction with others. This is how we could interpret what some papers (Black, Sanders and Lowell, 2003; Allgood et al., 2008) apparently suggest when pointing out that students who have taken more economics courses during their major earn more money (although the influence of self-selection, which they explicitly acknowledge, is unclear in their explanation). When dealing with MBAs, however, which are designed for leadership jobs, things work differently. The point is that, conversely to Oliver Williamson's view, the management of organizations is a much more complex process than dealing with organizational design in transaction cost economizing terms, which in fact represents a naive strategy for business performance and for managers' expectations to stay at their jobs. This is because business leaders do not only play a technical role (they are actually above technical jobs in terms of both hierarchy and salary). To perform their jobs, managers need to deal with personal relations and politics, requiring an extensive use of cheating and commitment heuristics. This is why courses based on plural and implicit human assumptions can help managers to deal with their workers, suppliers or clients. Management courses do not interfere with managers' contractual heuristics. On the contrary, they encourage their use to instinctively characterize each transaction and act accordingly. They do not indoctrinate individuals to presume their counterparts are guilty unless they prove to be innocent. Managers whose education has been based on management theories do not therefore tend to engage in paranoid safeguarding activity that intensifies distrust among potential economic partners. And finally, management courses do not propose ex ante calculation of optimum safeguards that would damage managers' relational capital by making them neglect the hardwired instincts of their partners. Their cost-benefit analyses can therefore include an instinctive assessment of the procedural and distributive justice of their actions, which is crucial to guarantee the feasibility of their strategies.

Summing up, economics does not necessarily have to change. It can actually offer a better education than management for many jobs. However, any attempt to widen the scope of economics education for leadership tasks requires adaptation of the economics principles to the particular traits of the transactions at stake. This may be a fruitful exercise if psychology and sociology insights are incorporated in economics reasoning, as in Cowen (2007) and Baron and Kreps (1998). Otherwise, the scientific preeminence of economics among the social sciences might lead to its being disseminated among a wider audience and for wider purposes than should actually be recommended.

Certainly, our results could also be consistent with some other explanations. In particular, they could reflect correlation without the hypothesized causation. For instance, it is possible that students self-select into business schools according to students' and schools' characteristics and that the observed differences in schools' average salaries are caused by unobserved students' characteristics (e.g., sociability) which are also driving their choice of school. In other words, more sociable students would choose schools with less economics in their curricula and will succeed professionally not because there they have less training in economics but because they started graduate school with better social skills. We find this explanation unsatisfactory, however, because according to survey evidence the choice of B-school is driven by other factors (e.g., Punj and Staelin 1978; Chapman, 1998; Olkin, 2004), but the doubt remains until more detailed econometric analyses are performed. Also, our results could also be consistent with a human capital explanation. Given that our wage data refers to starting salaries, the observed

difference could be a consequence of those managers with more economic training being hired for positions that in their first years compensate them relatively more in human capital. Testing this and many other explanations remains for future work. For the time being, the mere possibility of these explanations does not, however, refute our argument that economic training may be having negative effects on some management abilities.

5. Concluding remarks

Humans interact by applying a nuanced mixture of decisional mechanisms: innate heuristics, learned cultural practices and conscious rational thinking, and some mechanisms may collide and provoke conflict. Assuming that human behavior is decided by only one of these mechanisms may be a necessary simplification in many scientific endeavors. Believing such an assumption, however, can lead us to implement wrong relational strategies in social and economic exchanges. If it leads us to rely exclusively on building contractual safeguards ex-ante, this reliance will often trigger distrust in our partners, delaying, worsening or even precluding valuable transactions. Our results, showing that graduates from management-oriented MBAs earn about 1,000€ more a year for each 1% more weight of management courses in the program, are consistent with this view.

Managers, like most humans, are not highly reflective, strategic, rational, top-down planners (Mintzberg, 1973). Contractual heuristics play a significant and positive role in their daily interaction with their workers, suppliers and clients. They have been developed to confront evolutionarily recurrent stimuli, such as the need to cooperate, to make commitment strategies possible. When indoctrination leads managers to overemphasize their analytical competences and presume all their counterparts are not trustworthy, they risk engaging in an intense safeguarding activity that interferes with these less ‘rational’ and more ‘emotional’ interaction mechanisms. Conversely, MBA programs with a higher proportion of courses using management theories produce more successful managers because these courses present a less dogmatic and more descriptive approach to the contractual process. This approach helps future managers identify different relational frameworks, therefore stimulating a contingent—and therefore more successful—approach to economic and social exchanges.

It is worth emphasizing that an analytical education based on rationality and self-interest is not necessarily wrong. Blind emphasis on conscious, “rationalistic” safeguarding may be as damaging as full reliance on gut feelings for establishing one’s relationships. The point is that although calculative safeguarding may play an important role in specific transactions, economic agents need to consider its tricky interaction with automatic contractual heuristics. Thus, whereas economics may offer a good education for certain impersonal tasks, it may be harmful for individuals playing a leadership role. In our view, MBA programs with a higher proportion of courses using management theories produce better paid managers not because of the quality of these theories but because their courses present a less dogmatic and more descriptive approach to the contractual process. This helps future managers identify different relational frameworks, encouraging a contingent—and more successful—approach to economic and social exchanges. Management theories, which do not only handle concepts related to rationalistic opportunism but also involve others like trust, intrinsic motivation, ethical values or, more generally, emotions, do

not interfere with the adaptive nature of our contractual heuristics. They present a diverse and sometimes even contradictory nature of human behavior.

Our results may also have implications for contract theory, changing the nature of the contracting problem with respect to its common paradigm. If, as suggested by Stigler and Becker (1977), there were a single type of human beings prone to moral hazard or opportunism, the recipe would consist of designing incentive alignment mechanisms or, in Williamson's broader terms, "farsighted contracting". However, if there are actually several human types (and not humans with different reputations, as in Williamson, 1996, 13-14) or, if individuals are actually programmed to respond differently depending on the particular situation and partners they face, then the main challenge in contracting is not necessarily to protect parties against opportunism but to discriminate potential partners and contracting situations in order to display a different relational strategy in each transaction. General, indiscriminate, application of "incentive mechanism design" and "farsighted contracting" are coherent with a world of identical individuals. They are not consistent, however, with a world in which individuals are endowed with an arsenal of instinctively cooperative commitments and cheating detectors.

Finally, a by-product of our analysis is that it challenges the role of scientific knowledge and the relative importance of formal and informal education for all sorts of human interaction. It even holds an intriguing prospect for the relative value of social science and mere social knowledge. Specifically, it limits the application of rationality and self-interest assumptions to the normative area of individual decision making, including not only management but also contracting and policymaking. It may even explain why the application of economic analysis to these normative areas has been less clear, since success in such areas probably does not depend on an epistemological judgment but on adaptation. Hence, in the normative area, economics and all other theories that explicitly rely on rationality and self-interest may be weak even if they provide the greatest explanatory power—normative success requires functional adaptation and epistemological truth is not necessarily adaptive.

6. References

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Table 1. Descriptive Statistics of the top 100 MBA programs

<i>Variable</i>	<i>Source</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
<i>Salary</i>	FT	98	101386.4	27245.78	31184	176231
<i>Economics</i>	Built from MBA's Websites	98	35.40054	8.629844	16.66667	54.54546
<i>Management</i>	Built from MBA's Websites	98	14.626	5.771738	0	27.27273
<i>Ethics</i>	Built from MBA's Websites	98	.0189111	.030365	0	.0909091
<i>Core</i>	Built from MBA's Websites	98	60.13617	15.34357	27.27273	100
<i>GMAT</i>	BW and Websites	98	648.9388	35.80397	557	723
<i>Experience</i>	BW	98	62.71429	13.30917	25	98
<i>Budget</i>	BW	97	34696.64	13527.68	4000	60000
<i>Duration</i>	BW	98	18.17347	3.763705	10	24
<i>Enrollment</i>	BW	98	378.0918	326.8504	26	1805
<i>Homogeneity</i>	Index built from BW data	98	0	1	-3.012106	2.099959
<i>Research</i>	Index built from FT data	98	0	1	-3.020171	1.829468
<i>USA</i>	FT	98	.5816327	.4958273	0	1
<i>Europe</i>	FT	98	.244898	.4322376	0	1
<i>Placement</i>	FT	98	0	1	-1.705162	1.703757
<i>Feminine</i>	Index built from FT data	98	0	1	-2.155211	2.991765
<i>International</i>	Index built from FT data	98	0	1	-1.699146	3.03801
<i>Faculdoct</i>	FT	98	87.29592	18.70344	0	100
<i>Doctorrang</i>	FT	98	46.64286	27.32328	1	81
<i>Researchrang</i>	FT	98	49.44898	28.54012	1	95
<i>Gmatdisp</i>	Built from BW data	98	.1863082	.0531585	.0847458	.3442623
<i>studentage~p</i>	Built from BW data	98	.2780801	.1027466	.1071429	.7931035
<i>Workexpdisp</i>	Built from BW data	98	1.216132	.5233243	.3225806	3.84
<i>Womenfacul</i>	FT	98	20.66327	6.693502	0	36
<i>Womenstud</i>	FT	98	28.46939	7.401872	13	56
<i>Womenboard</i>	FT	98	14.61224	9.450503	0	50
<i>Intlfaculty</i>	FT	98	30.89796	19.46103	2	98
<i>Intlstudent</i>	FT	98	43.59184	21.21215	11	96
<i>Intlboard</i>	FT	98	19.64286	23.03617	0	95
<i>Intlmobility</i>	FT	98	48.96939	29.06851	1	100
<i>Intlexperr~k</i>	FT	98	49.70408	27.97171	1	98
<i>Languages</i>	FT	98	.1734694	.431385	0	2

Notes: FT: *Financial Times*' MBA ranking, 2003; BW: *Business Week*'s MBA Profiles, 2002.

Table 2. Relation between behavioral assumptions used in the core courses of the top 100 MBA programs and their graduates' average salary

Variables	Single equation model (OLS)		Systems of simultaneous equations (3SLS)	
	Dependent variable:		Salary equations	
	Salary		Salary	
	(1)	(2)	(3)	(4)
<i>Economics</i> (% of courses based on self-interest in the MBA core)	24.47 (162.75)		84.78 (152.80)	
<i>Management</i> (% of courses based on “plural” human assumptions in MBA core)	1,065.50 ^{***} (257.12)	1,050.05 ^{***} (237.35)	992.74 ^{***} (235.85)	995.04 ^{***g} (232.28)
<i>Ethics</i> (weight of a Business Ethics course in the MBA core, in %)	8,363.27 (44,289.79)		8,194.83 (39,412.43)	
<i>Core</i> (% of compulsory courses in total number of courses required for the MBA)	216.22 ^{**} (99.16)	216.04 ^{**} (92.25)	191.93 ^{**} (90.03)	167.71 ^{**} (84.88)
<i>GMAT</i> (average score of each school's students in the GMAT)	369.98 ^{***} (52.93)	369.39 ^{***} (50.67)	472.10 ^{***} (133.61)	253.20 ^{***} (72.76)
<i>Experience</i> (average work experience of the school's students, in months)	296.10 ^{**} (116.39)	294.42 ^{**} (114.21)	298.40 ^{***} (105.36)	247.10 ^{**} (101.06)
<i>Budget</i> (annual \$ expenditure during the MBA, including tuition and living costs)	0.64 ^{***} (0.12)	0.64 ^{***} (0.12)	0.60 ^{***} (0.11)	0.66 ^{***} (0.11)
<i>Duration</i> (normal time length of the MBA, in months)	143.20 (632.84)	136.40 (575.83)	200.97 (585.10)	
<i>Enrollment</i> (total number of MBA full time students)	19.05 ^{***} (5.70)	19.07 ^{***} (5.44)	18.61 ^{***} (7.12)	23.67 ^{***} (6.08)
<i>Homogeneity</i> (index of students homogeneity in GMAT, age and work experience)	-3,013.53 [*] (1,583.39)	-2,973.99 [*] (1,534.62)	-4,303.09 [*] (2,245.84)	
<i>Research</i> (performance index of the schools' research)	-231.66 (1,731.46)		-1,544.34 (1,831.15)	
<i>USA</i> (dummy variable = 1 for USA schools; 0 otherwise)	13,844.44 ^{***} (4,772.97)	13,656.88 ^{***} (4,392.97)	12,099.43 ^{***} (4,561.20)	12,490.74 ^{***} (3,774.75)
<i>Europe</i> (dummy variable = 1 for European schools; 0 otherwise)	11,191.96 ^{**} (4,870.32)	11,322.05 ^{**} (4,504.96)	10,306.72 ^{**} (4,406.37)	9,339.06 ^{**} (4,125.03)
Constant	-229,454.35 ^{***} (39,763.46)	-227,485.98 ^{***} (37,967.84)	-293,776.09 ^{***} (85,420.24)	-144,019.55 ^{***} (46,564.31)
R-squared	0.8350	0.8349	0.8234	0.8229
			GMAT equations	
			(3)	(4)
<i>Salary</i> (average weighted salaries of each school, three years after graduation, in US \$)			0.0002451 [*] (0.0001371)	0.0002484 [*] (0.0001352)
<i>Placement</i> (performance index of the schools' placement services)			11.67 ^{***} (3.11)	12.08 ^{***} (3.11)
<i>Homogeneity</i> (index of students homogeneity in GMAT, age and work experience)			10.06 ^{***} (2.45)	10.84 ^{***} (2.46)
<i>Research</i> (performance index of the schools' research)			7.69 ^{***} (2.81)	6.96 ^{***} (2.65)
<i>Feminine</i> (index measuring feminine presence in the school)			-3.45 (2.21)	
<i>International</i> (index measuring school's internationalization)			0.89 (2.37)	
Constant			624.00 ^{***} (14.10)	623.64 ^{***} (13.91)
R-squared			0.6334	0.6327
Observations	97	97	97	97

Notes: Standard errors in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.

7. Annex

Table A.1. Principal components analysis used to build the Homogeneity index

<i>Component</i>	<i>Eigenvalue</i>	<i>Difference</i>	<i>Proportion</i>	<i>Cumulative</i>
1	1.76587	0.99975	0.5886	0.5886
2	0.76613	0.29813	0.2554	0.8440
3	0.46800	.	0.1560	1.0000
<i>Eigenvectors:</i>				
<i>Variable</i>	<i>1</i>	<i>2</i>	<i>3</i>	
<i>Gmatdisp</i>	0.51138	0.80374	0.30411	
<i>studentage~p</i>	0.63774	-0.11775	-0.76120	
<i>Workexpdisp</i>	0.57600	-0.58321	0.57280	
<i>Scoring coefficients</i>				
<i>Variable</i>	<i>1</i>			
<i>Gmatdisp</i>	0.51138			
<i>studentage~p</i>	0.63774			
<i>Workexpdisp</i>	0.57600			

Table A2. Principal components analysis used to build the *Research* index

<i>Component</i>	<i>Eigenvalue</i>	<i>Difference</i>	<i>Proportion</i>	<i>Cumulative</i>
1	1.54898	0.68733	0.5163	0.5163
2	0.86165	0.27229	0.2872	0.8035
3	0.58936	.	0.1965	1.0000
<i>Eigenvectors:</i>				
<i>Variable</i>	<i>1</i>	<i>2</i>	<i>3</i>	
<i>Faculdoct</i>	-0.58299	0.55703	0.59147	
<i>Doctorrank</i>	0.48575	0.82251	-0.29584	
<i>Researchrank</i>	0.65129	-0.11484	0.75009	
<i>Scoring coefficients</i>				
<i>Variable</i>	<i>1</i>			
<i>Faculdoct</i>	-0.58299			
<i>Doctorrank</i>	0.48575			
<i>researchrank</i>	0.65129			

Table A3. Principal components analysis used to build the Feminine index

<i>Component</i>	<i>Eigenvalue</i>	<i>Difference</i>	<i>Proportion</i>	<i>Cumulative</i>
1	1.43268	0.44317	0.4776	0.4776
2	0.98951	0.41170	0.3298	0.8074
3	0.57781	.	0.1926	1.0000
<i>Eigenvectors:</i>				
<i>Variable</i>	<i>1</i>	<i>2</i>	<i>3</i>	
<i>Womenfacul</i>	0.66583	-0.32393	0.67211	
<i>Womenstud</i>	0.25157	0.94555	0.20651	
<i>Womenboard</i>	0.70241	-0.03158	-0.71107	
<i>Scoring coefficients</i>				
<i>Variable</i>	<i>1</i>			
<i>Womenfacul</i>	0.66583			
<i>Womenstud</i>	0.25157			
<i>Womenboard</i>	0.70241			

Table A4. Principal components analysis used to build the *Internationalization* index

<i>Component</i>	<i>Eigenvalue</i>	<i>Difference</i>	<i>Proportion</i>	<i>Cumulative</i>		
1	2.97799	2.05724	0.4963	0.4963		
2	0.92075	0.21422	0.1535	0.6498		
3	0.70652	0.07609	0.1178	0.7675		
4	0.63043	0.19332	0.1051	0.8726		
5	0.43711	0.10989	0.0729	0.9455		
6	0.32721	.	0.0545	1.0000		
<i>Eigenvectors:</i>						
<i>Variable</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
<i>Intlfaculty</i>	0.36063	0.48604	-0.59956	0.34175	-0.38227	0.10635
<i>intlstudent</i>	0.47198	0.22145	0.24096	-0.25833	0.31544	0.70986
<i>Intlboard</i>	0.45124	-0.06923	0.07919	0.54182	0.59431	-0.37222
<i>intlmobility</i>	-0.42727	-0.33467	-0.41510	0.38916	0.31777	0.52981
<i>Intlexperr~k</i>	-0.35413	0.45730	0.58073	0.53263	-0.14454	0.15373
<i>Languages</i>	0.36824	-0.62355	0.25813	0.29624	-0.52848	0.20471
<i>Scoring coefficients</i>						
<i>Variable</i>	<i>1</i>					
<i>Intlfaculty</i>	0.36063					
<i>intlstudent</i>	0.47198					
<i>Intlboard</i>	0.45124					
<i>intlmobility</i>	-0.42727					
<i>Intlexperr~k</i>	-0.35413					
<i>Languages</i>	0.36824					

Table A5. Correlations

	<i>Salary</i>	<i>Eco- nomics</i>	<i>Man- agement</i>	<i>Core</i>	<i>GMAT</i>	<i>Experi- ence</i>	<i>Budget</i>	<i>Dura- tion</i>	<i>Re- search</i>	<i>Enroll- ment</i>	<i>Homo- geneity</i>	<i>USA</i>	<i>Europe</i>	<i>Place- ment</i>	<i>Femi- nine</i>	<i>Inter- national</i>
<i>Salary</i>	1.0000															
<i>Economics</i>	0.1509	1.0000														
<i>Management</i>	0.2865	0.0671	1.0000													
<i>Core</i>	-0.0569	-0.1187	-0.0311	1.0000												
<i>GMAT</i>	0.7063	0.2121	-0.0627	-0.1452	1.0000											
<i>Experience</i>	0.0179	0.1485	0.2112	0.0712	-0.1739	1.0000										
<i>Budget</i>	0.6616	-0.0385	0.0249	-0.2596	0.5028	-0.2779	1.0000									
<i>Duration</i>	0.1366	-0.2230	-0.2922	-0.3875	0.3332	-0.5640	0.5800	1.0000								
<i>Research</i>	0.4242	0.0947	-0.1313	-0.2953	0.5190	-0.2071	0.4417	0.3721	1.0000							
<i>Enrollment</i>	0.7314	0.1748	0.1111	-0.0850	0.6185	-0.1526	0.5862	0.2321	0.5172	1.0000						
<i>Homogeneity</i>	0.3831	0.1529	0.0137	0.0702	0.5244	0.0673	0.3126	0.1420	0.2277	0.2743	1.0000					
<i>USA</i>	0.3865	-0.0935	-0.2215	-0.3974	0.4349	-0.4120	0.6406	0.7372	0.5974	0.4198	0.2858	1.0000				
<i>Europe</i>	-0.1283	-0.0130	0.3332	0.3049	-0.3746	0.4800	-0.4407	-0.7205	-0.5105	-0.3300	-0.0749	-0.6845	1.0000			
<i>Placement</i>	0.5738	-0.0519	-0.0403	-0.1037	0.6447	-0.3144	0.5396	0.3611	0.5232	0.5791	0.3213	0.5119	-0.3987	1.0000		
<i>Feminine</i>	-0.2574	0.0125	0.0845	0.0140	-0.2133	0.0953	-0.2324	-0.2916	-0.0157	-0.1575	-0.2139	-0.2182	0.1407	-0.1488	1.0000	
<i>International</i>	-0.1056	0.0409	0.2021	0.3072	-0.1803	0.3181	-0.3719	-0.6232	-0.3824	-0.1035	-0.0557	-0.7622	0.6770	-0.2684	0.0654	1.0000