

Visions of the past: wish you had been there

Roy Thurik

Erasmus School of Economics and Montpellier Business School

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1. Some introduction

It is the kind of request that simultaneously thrills and induces panic: colleagues – nay, friends – approaching you, claiming that you are “one of the indisputable pioneers leading scholarship and thinking in entrepreneurship,” then, in the next breath, ask you to write something that “clearly articulate what were your most important ideas about entrepreneurship, what led you to develop those ideas into the literature, and what has been the impact of those ideas.”

A 35-year long career in entrepreneurship research has led to many ideas: some well matured, others hardly ripened; some well cited, others completely overlooked; some hopelessly off the mark, others getting right to the heart of the matter; and some the result of hours spent alone in my office, others more a result of an evening pondering the world with wine and friends.

With these marching orders, my first inclination was to plunder my own website in order to list the published scholarly contributions that I have (co-)authored over the years. My spreadsheet is nearly 200 rows long. Starting with a 1984 publication in *Journal of Retailing* about part-time labor in various shop types, it ended with a 2016 publication in *Applied Psychology* about ADHD and entrepreneurial orientation.

At first glance, I was startled: these contributions appear to be completely unrelated – the only common thread that came to mind when I first reviewed the list was one Roy Thurik: “me, myself, and I”. Yet, there had to be more – my research had evolved. Would it be possible to identify chapters in my professional life? Playing with the spreadsheet, I tried to make it as perfect as possible: uniformity in the referencing system typically has a calming effect on me. But it did not in this case, so I resorted to doing what any one of the “indisputable pioneers leading scholarship and thinking in entrepreneurship” - would do: I started typing.

Thus the panic turned into a sense of reward: the forced introspection allowed me to realize that my professional life has bled into my personal life, with colleagues becoming friends. Looking at each row brought back memories as I found the research that stands out, as well as uncovered long forgotten papers and projects. As the rows scrolled by, memories

built, and I quickly arrived at a major conclusion: I have been very lucky in choosing fields, colleagues, work environments, networks and employers.

But would I now want to have done things differently? Maybe I should have tried to write fewer texts of a higher caliber. But developing a field often goes together with multiple attempts. Working with young PhDs – which I like tremendously – requires guiding them through the swampy morass that is peer review. Thus, aiming at lower ranked journals may be helpful. Also, there was often so much data available, waiting to be analyzed, and since journals attach no value to “internal replication,” I would have quickly have abandoned the higher caliber strategy.

2. Some more introduction

With the advantage of having “lived” a scientific career, I can see that there are three principle approaches, each with its own pros and cons: (1) one can fill in gaps in an existing field; (2) one can extend an existing field by introducing new concepts and/or connecting it to another one; or (3) one can try to discover new fields. With the benefit of hindsight, it is clear that my career business model is to try and discover new fields, but then move on after the really clever people take it over.

I hope that I contributed to retail economics and small business economics, to connecting entrepreneurship and macroeconomics, to economic behavior and biology (such as genes and hormones) and to using neurocognitive mechanisms (such as hyperactivity, addictive behaviors, hypomania) and psychopathological symptoms (such as motivational drive, preference for reward, inhibitory control) for economic behavior. Using neurocognitive mechanisms and psychopathological symptoms for economic behavior is more a promise than a reality. Still, I can already point to decent progress. In the connection between entrepreneurship and the macro economy, I feel that I did not do a good enough job. I could never convince my macroeconomics colleagues that entrepreneurship was a serious contribution to their models. A manuscript that I count as being one of the best I ever contributed to has been rejected numerous times, is still not published and – consequently – is not part of my Excel exercise. It is about adding an entrepreneurship measure to several families of existing models explaining total factor productivity (TFP) for countries over time. Maybe here lies yet another reason why a high caliber strategy is not always compatible with the quest for a new field. After reading multiple rejection letters, I got the feeling that referees never quite appreciated the novelty of our introduction of entrepreneurship into the existing models. They were more concerned about whether the latest models and techniques of their macroeconomics world were applied.

The same thing happened when I was involved in a series of papers connecting attention-deficit/hyperactivity (ADHD) and entrepreneurial behavior [192, 200]. Referees of the top journal were overly concerned about the definition and treatment of our concepts of entrepreneurship behavior – which is known material – but barely commented upon the newness of ADHD as a factor linked to entrepreneurial behavior. The frustration of a lifetime happened with our papers on genes and entrepreneurship [138, 146, 149, 160, 179, 184] which I tried to bind together in my “gentreprenomics” paper [195]. Indeed, we never found the entrepreneurial gene, but the scholarly management/entrepreneurship community pretended to be blind to the newness of our approach. Ultimately we moved to management and entrepreneurship journals not ranked among the highest to publish our results. This is a clear example of having to abandon the high caliber strategy.

So, I started typing and – *Accio!* – my life’s professional chapters appeared as if summoned by Harry Potter waving his wand. The many rows naturally reduced to several distinct chapters. *Ex post* self-documentation is inherently intriguing; hopefully not just for me, but also for my old and new colleagues. With the benefit having written and rereading the text that follows, I noticed that streaming through the inevitable self-congratulatory element, the loose ends are often stressed more than the solid contributions. I cannot wait for my colleagues to comment here. For the general reader, I am not so sure that the text brings much. Or maybe it brings a general lesson: work hard, be nice, be generous, and also be sure to stay lucky and healthy. Another lesson? I never put much value on contributing to finding and describing a central paradigm in the field of small business economics or that of entrepreneurship economics. I rarely tried to contribute to the endless and fruitless battles over the definition of entrepreneurship [74, 147]. Generations of students were startled when I announced that I would not begin my entrepreneurship course with a long deliberation of its definition. Instead I concentrated on its causes and consequences, always leaving its definition somewhat open. It is much more fun and effective to look at small business and entrepreneurship as phenomena having a meaning in other fields of scientific discovery, such as industrial organization, macroeconomics, epidemiology and psychiatry, and to trying to find out what that meaning is for them. By venturing out to other fields, my work seems to be hopelessly spread out. Still, it is fascinating and motivating to stick one’s nose in someone else’s field – in my case bringing my entrepreneurship construct to the table and seeing how they respond to it.

Below I will often use “I,” but for the reasons described above I have very few single authored products or solitary initiatives. So, the “I” represents some form of “we”, but since I am the only constant within this “we” over the last 35 years, is easiest to use “I.”

3. In the beginning there was productivity and pricing

How could I resist? I had just finished my studies of econometrics at Erasmus University Rotterdam (EUR), which was – and still is - a separate curriculum, with no clue how to apply my newly acquired knowledge. And then my professor of statistics, Johan Koerts, offered me a job at an independent research institute for small- and medium-sized businesses, EIM, which much later became Panteia. An abundance of data for many of these businesses was available at the institute, but only tables of descriptive data were actually printed and made public. While differences in productivity across different sized businesses were well documented, the question of why such differences existed remained unasked. Instead, the reports resorted to storytelling. This called for some applied micro-economic cross-sectional analyses. My senior colleague at the institute, Bart Nooteboom, helped me a lot. Analyzing retail business labor productivity was fun and easy. Scale effects [5, 13, 14, 19], part-time labor [1], French hypermarkets [22], Japanese stores [49, 32, 38], opening hours [53, 20] and degree of affiliation [7] were analyzed and journals were eager to print our results. I only remember two journal rejections of my early productivity work. Similar studies were done on the hotel and catering business [2], the wholesale business [28, 34], and comparing sectors [23]. After analyzing individual businesses, the road opened to also look at the development of productivity for entire small business sectors [3] and across time [16].

When my professor of operations research heard that I was working on projects explaining productivity differences in the retail sector he reacted in his very own style: “what do I hear, Roy, you are now calculating grocery shops? Hahaha. And you were always so smart and promising?” This lack of understanding with a mild twist of contempt convinced

me that I was on the right track: presumed adversity can be a stimulating starting point for an endeavor.

Amazingly, retail floor space productivity was often analyzed independently of labor productivity [4, 11, 30]. Only sometimes substitution played a role in our modeling [8, 21]. There were so many stylized facts to be discovered in this area of scale economies of small businesses and other factors determining productivity differences that several years passed before more sophisticated modeling produced papers in such journals like the *Journal of Econometrics* [9] and *European Journal of Operational Research* [35]. My PhD thesis, which I defended in 1984, consisted of eight chapters analyzing productivity differences in retailing [6]; each was published in an internationally recognized journal.

It was some time before pricing became a part of my endeavors [54, 15, 29]. It was a great inspiration to be able work with Bart Nooteboom on retail mark-up pricing and the role of costs, expectations and environmental determinants [17, 25, 27, 10, 24, 36, 39, 46, 52]. It not only led to similar analyses in other sectors, such as the hotel and catering sector [18, 51] and manufacturing [26], but also to the realization that these type of studies belong to an already existing scholarly field called industrial organization.

The day after I defended my PhD thesis and while I was recuperating from too much alcohol celebrating it, I suddenly realized that I had missed the whole point of all my projects on retail productivity. What I had found was that larger shops were always more productive than smaller ones, but I never asked why smaller shops exist, given that the scale effect is so pervasive. This question is one of the focal questions of a field called small business economics, but its time had not yet come.

4. Embedment, encounters and economics

The pioneer phase of my career happened at the Econometric Institute of Erasmus University of Rotterdam (EUR). Discipline-free empirical investigations were encouraged as long as their statistics were done in the right, rigorous, fashion. In the early days of the applied microeconomic analyses of retail firms, we found some publication shelter in areas such as marketing or retailing itself: in the *International Journal of Research in Marketing* [12, 21, 28] and *Journal of Retailing* [1, 11, 15]. Later I started to realize that industrial organization seemed to provide a better environment [37, 43, 47, 50].

Undoubtedly, the most important encounter of my entire career was meeting David Audretsch at the 15th EARIE (European Association for Research in Industrial Organization) conference in Rotterdam in 1988. He had just trained up from Dordrecht, where he had signed a contract with Kluwer Publishers to establish a new journal to be called *Small Business Economics Journal*. I had just made a deal with my dean at the Erasmus School of Economics to name the part-time chair to which I had been appointed to the year before as “small business economics.” Since then, David and I have written about forty articles together. At the same time, I have co-authored nearly thirty articles in *Small Business Economics Journal*, and I refereed at least a hundred articles, all while taking on the shadow editor role at *Small Business Economics Journal* assisting David Audretsch and Zoltan Acs. But most importantly, I have slept many nights in the “famous economist guest room” at Audretsch residences on both sides of the Atlantic.

Slowly my work became recognized in general interest economics journals like *European Economic Review* [24], *Economics Letters* [10, 26, 40], *De Economist* [18, 37, 42, 51], *Southern Economic Journal* [83], *Journal of Economic Behavior and Organization* [68], *Weltwirtschaftliches Archiv* [46], *Journal of Institutional and Theoretical Economics* [56]

and *Applied Economics* [67]. Not the highest journals in economics, but these initiatives helped small business economics become an accepted part of the economics discipline. It also helped me get a full chair in small business economics at the Erasmus School of Economics in the early 1990s.

The field of industrial organization, with journals such as *Review of Industrial Organization* [47, 59, 60, 85, 110] and *International Journal of Industrial Organization* [75, 91], provided an interesting testing ground of our ideas. Martin Carree, my only PhD student to receive *cum laude* and who became full professor fairly quickly afterwards, played a big role here. Our studies of entry and exit behavior of businesses were well received [55, 48, 60, 75]. I still regret that we never used the discrepancy between replacement (businesses entering because others exited) and displacement (businesses exiting because others entered) as a measure of competition in an industry. I similarly regret that I abandoned writing a paper called “storming the minimum efficient scale (MES).” Businesses can and do survive at a level of output below the MES by offering a different product or using a different production factor [85, 91] than their larger scaled counterparts. Alternatively, their existence can be understood from the standpoint that they have only limited time to survive below the MES and hence “must storm it.”

The organizers of the EARIE conferences were quick to understand the role of small businesses for the organization of industries. In 1985 our paper was rejected for the 12th EARIE conference in Cambridge because, in the words of the referees, “it was about small business and we were meant to know that small businesses were no part of the scholarly field of industrial organization.” With that in mind, the word small business economics was only conspiratorially whispered between David and me at the 15th edition in Rotterdam. There were a dozen or so small business papers at the 16th edition in Budapest, all well quarantined in separate sessions. At the 17th edition in Lisbon in 1990, empirical small business papers were an integral part of the entire program, despite the fact that the theoretical game theory papers dealing with the struggles of large businesses were considered to be the promising future of industrial organization.

5. Discovering small business economics

I have always held a small part-time position at the research institute for small- and medium-sized businesses, EIM, now called Panteia, located in Zoetermeer in the so-called “green heart of Holland.” While I was fully employed by the institute from 1977 onward, I generally spent two days a week at the Econometrics Institute of EUR as a visitor. From 1987 I did so while having a part time chair in small business economics at EUR. In getting this chair I was lucky: at the time the Erasmus School of Economics – of which the Econometrics Institute was part - was looking for scientifically coherent research programs with a well-defined problem area. The then Ministry of Science and Education wished to better organize academic research, and one way to do this was called “conditional research financing.” There was no financing involved. Hence, it was certainly not conditional, but the term had some attraction value and it meant that universities had to identify coherent programs. After defending my PhD thesis in 1984, I was dissatisfied with my research methodology despite the fact that I managed to publish all eight chapters. So, I started to look for colleagues at the Econometrics Institute who could help me do a better job by going over my work and applying more sophisticated methods. Many showed interest and the resulting initiative, called “retail econometrics,” was the ideal example of a “conditional research financing” program. As someone not on the payroll of the Econometrics Institute, since he was only a visitor, could not be leader of such a program, a part-time chair was established for me.

From 1992 my main employer was EUR, although one day a week was devoted to EIM; which I will call Panteia from here on. Peter van Hoesel, the Panteia director at the time, wanted me to stick around, so he offered me a “fellow” contract. This meant that I could do whatever I felt had to be done, which is exceptional and generous for a commercial institute. My role at Panteia evolved from being a young researcher showing that applied econometric techniques may help discriminate between the determinants of productivity in small businesses to that of scientific advisor for an entire research program on small business. In the latter role I served as *trait-d’union* between the scientific research of academia and the applied research of a commercial institute like Panteia. This role determined my view of doing scientific work and how to organize it. Without Panteia, its mission and its data sources, I would never have been able to show my colleagues at EUR and elsewhere that there is actually a field called small business economics and that I could contribute developing this field. On the other hand, without the implicit support of EUR and the wider academic world, Panteia would never have been able to keep carrying out its famous “research program on entrepreneurship and small business,” financed by the Dutch ministry of economic affairs. Unfortunately, this program was terminated in 2015, and I stopped working as a Panteia scientific advisor in 2016. It was the end of an era.

My golden days at Panteia were without any doubt the closing years of the previous century and the first decade of the present one, from 1997 onwards, when Sander Wennekens was director of the “research program on entrepreneurship and small business,” and I was his right hand man. This coincided with a series of stimulating and productive visits to the Institute of Development Strategies (IDS) at the School of Public and Environmental Affairs of Indiana University Bloomington. The IDS director was the young man I first met in 1988: David Audretsch. As a research fellow, I contributed to investigations of how geographical places perform, how to identify what needs to be done to make them better, and what the role of entrepreneurship may be [92, 144, 163]. IDS is also the place where I met Adam Lederer who was meant to play such a big role as managing editor of *Small Business Economics Journal*. A few years later, David Audretsch re-appeared in Europe, this time as directing the Entrepreneurship, Growth and Public Policy group at the Max Planck Institute of Economics in Jena, Germany, from 2004 through 2010. There I served as a visiting research professor, participating in the three Kauffman-Max Planck-Ringberg conferences, in 2006, 2007 and 2008. These were clear highpoints for scholars of entrepreneurship, economic development and public policy [145], defining markers of an era.

The Erasmus School of Economics also had an important role in creating the field of small business economics. I founded a small research group called CASBEC (Centre for Advanced Small Business Economics), I had my chair, and there were close contacts to Panteia and *Small Business Economics Journal*. Moreover, two important conferences were held in cooperation with the Tinbergen Institute at EUR. They were called the third and the fourth “Global Conference on Small Business Economics.” It was never revealed whether there had ever been a first or a second conference, or when and where they had been held. The first of the two Rotterdam conferences resulted in two special issues of *Small Business Economics Journal* [57, 58] and one in *Review of Industrial Organization* [59]. The second conference resulted in an edited volume with *Cambridge University Press* [81]. Thus, my scientific positioning moved from an orientation toward retailing, marketing [64, 69] and industrial organization to that of issues of smallness, such as structural change of industries and size distribution [45, 12, 33], specific elements of smallness such as exports [41], R&D [42, 56], competitive position [72, 91], debt ratios [61, 44], survival [79, 85], efficiency [76], productivity [84], and innovation [65]. In the adapted version of my inaugural lecture of 1989 [31] I volunteered some thoughts about what, in fact, constituted small business economics. It

could and should be executed at all levels of aggregation: firms, industries and economies. I stressed the role the entrepreneur should play in small business research. And, finally, I provided several reasons why small business economics is a relevant and important discipline. Today they seem to be a series of obvious statements.

6. The E of SBE

Still more importantly, I arrived at what would become a main theme for at least fifteen years: the interplay between small firms – and what was later termed as entrepreneurship – and the macro economy. It started off with a series of empirical publications in obscure journals like *Atlantic Economic Journal* [70] in edited book volumes published by *Basil Blackwell*, *JAI Press*, *Cambridge University Press* and *Edward Elgar Publishing* [63, 62, 77, 78, 88]. These studies show with simple means that smallness can positively affect economic performance at aggregate levels. They provided the roots for four approaches. The *first* approach was a conceptual one about the role of small firms – which was more and more frequently referred to as entrepreneurship – in the macro economy and in particular for economic growth [102, 124, 153, 74, 93, 95]. My publication, with Sander Wenekers, in *Small Business Economics Journal*, called “Linking Entrepreneurship and Economic Growth” [74] would prove to be my best cited with nearly 1800 Google Scholar hits in 2016. It also ranks first among the most highly cited articles ever published in *Small Business Economics Journal*.

The *second* approach consisted of a series of empirical single equation studies, often based on aggregate panel data, on the role of small firms for economic growth and development [166, 94, 96, 111, 112, 113, 127, 135, 147]. In particular, the two *Small Business Economics Journal* publications [112, 113] using material from the Global Entrepreneurship Monitor received many citations.

The *third* approach was again conceptual and coupled the changing role of small business and entrepreneurship with a larger change in the economic system, which was coined the switch from the managed to the entrepreneurial economy [132, 73, 86, 90, 107, 109, 183]. David Audretsch played a crucial role in helping me understand this switch and writing up the analyses. These analyses also helped better understand the role the second ICT (information and communication technology) revolution played in developed modern and developing [164] economies. It provided important material for the foundation of courses in small business economics for both students and entrepreneurs with a distinct societal flavor that I gave at the Free University of Amsterdam and at Erasmus University Rotterdam. Martin Carree and I had great fun bringing together material for the *Handbook of Entrepreneurship and Economic Growth* [125, 124], but again the economics flavor dominated.

The *fourth* approach was based upon a stylized fact: in many OECD countries, U-shaped entrepreneurship rates (business owners per workforce) can be observed over time as well as over the level of economic development [147]. This U-shape results from the fact that the entrepreneurship rate has declined since there is economic life, but this decline stopped in the early 1990s and a reversal has even set in. The resulting trough marks the beginning of the entrepreneurial economy [86, 90]. I never managed to theoretically derive this U-shape from the many interplays between entrepreneurship and macroeconomic phenomena, such as unemployment or economic growth, which separately have all been well documented [140]. However, we did some work on the U-shape or L-shape as a normative development, while deviations consequently lead to growth penalties [94, 96, 127].

7. Policy and the business cycle

My studies on the changing role of small business and entrepreneurship in the economy and society inevitably led to policy contemplations. The so-called eclectic theory of entrepreneurship [97] provided a basis with many off shoots [80, 92, 98, 103, 133, 144, 163, 161, 188]. This model is not based on real theory because it is highly eclectic in that it borrows many stylized facts from diverse fields showing the complex effects different policies may have on entrepreneurship and how then entrepreneurship influences the structure of the economy [186]. It should have provided the basis for a contemplation that entrepreneurship policy does not exist, *per se*, but that policies in general have entrepreneurship effects, but I never wrote this up. My “entrepreneurics” paper, a combination of the “from the managed to the entrepreneurial economy” view and the eclectic theory never caught much attention [145], while the simple analysis of the effect of business regulations of nascent and young entrepreneurship did catch considerable attention [128]. I tried to improve my view on regulation and compliance by contributing to an edited volume [142, 141] as well as my view on job flows in traditional service industries by contributing to another edited volume [87]. Differences between the US and Europe concerning determinants of entrepreneurship and the role of policy were laid out in a Kluwer Publishers edited volume [99], while I kept struggling with whether entrepreneurship policy existed in an Edward Elgar volume [134].

While thinking about the interface of entrepreneurship and policy, one is bound to start exploring the role of culture. This fascinating area was investigated in many publications [156, 175, 104, 154, 165, 108, 129, 130, 131]. Dissatisfaction, uncertainty avoidance and post-materialism are among the phenomena taken into account in these studies. The publications in the special issue of *Journal of Evolutionary Economics* [129, 130, 131] are particularly remarkable because one would hardly look for the role of sluggish culture effects in a journal on economic dynamics. They were well received and subsequently Springer devoted an edited volume to the full content of this special issue [154, 155]. Some studies on social entrepreneurship [173, 150] are closely linked to my portfolio of culture studies.

The investigations of entrepreneurship and the economy culminated in a later phase with studies on the interplay between self-employment and unemployment using a vector autoregression (VAR) model for 23 OECD countries for the period 1974-2002 [140] and in specific countries like the UK [100], Spain [120] and Portugal [122, 126]. In the *Journal of Business Venturing* [140], the many alleged effects between self-employment and unemployment and their lag structure are dealt with from many angles. André van Stel played a big role in getting these and other aggregate growth studies on the road, not only because of his econometric expertise but also because he is the mastermind behind the famous Compendia (COMparative Entrepreneurship Data for International Analysis) data set. Some studies of Gibrat’s Law on the disproportionate effect of firm size on growth [121, 101, 110] should have been built into the macro determinants of self-employment, but never were.

When the economy went in a recession in 2008, my colleague Phillip Koellinger suggested looking beyond the interplay between changes or levels of self-employment, unemployment and aggregate output, going to the heart of the matter by examining the interplay between their cyclical effects [172]. This publication in the *Review of Economics and Statistics* led to some spin-offs [189, 193, 194]. The main conclusion is that indeed there is a self-employment cycle and that it is affected by the unemployment cycle. Although it received many citations, few were in the world of macroeconomics.

8. Finally, some entrepreneurship research

Through my many contacts with the European Commission, I met Isabel Grilo, who pointed me to the Eurobarometer Entrepreneurship. Together with her and many others, I wrote a series of papers about the determinants of entrepreneurship, but not in the traditional way. Instead of explaining whether or not people become an entrepreneur – in other words what the likelihood is that they become an entrepreneur – instead we set up what we termed as the entrepreneurship ladder model discriminating between successive engagement levels [123, 115, 117, 137, 151, 152, 157, 162, 168, 169, 178]. I really like this series of papers: many data sets were analyzed using similar models or methodologies with minor variations in the phenomenon to be explained, all covering a wide range of determinants and countries. Such an approach calls for an umbrella text binding it all together. I never wrote that text for a simple reason: despite the many and coherent findings suggesting that the ladder approach makes sense, the effect sizes of the usual suspects among the determinants, such as age, education, experience and risk averseness, remained small. My sense was that in terms of modeling we were on the right track, but in terms of determinants we missed the point. Life intervened - as is often the case - and showed me where to look for the missing link.

But before I elaborate on this, let me first devote some words to my endeavors in the world of hard-core entrepreneurship research. This is not the place to define what is hard-core entrepreneurship research. It is a relatively new and productive field that has fought its way into the ranks of management sciences. However, it is obsessed by new theory and consequently attaches a low value to replication of results. It is vulnerable to data and theory mining. However, it has made immense progress in terms of academic results and respectability in the last two decades mainly thanks to journals like *Journal of Business Venturing*, *Entrepreneurship: Theory and Practice*, *Small Business Economics Journal*, and *Strategic Entrepreneurship Journal*. Although I have been employed as an entrepreneurship researcher for decades, my contribution in this area is limited. I did some gender work [89, 114, 119, 143], some technical work on endogeneity and instruments [170, 171, 182], some work on practices and performance [82, 106, 116, 118, 158], on finance [89, 44] on entrepreneurial aspiration and motivation [136, 139], location decisions [187, 198] and start-up modes [185]. There was never a technical follow up of the one pager in *Harvard Business Review* [148] on Blue Ocean, although this would have been fun: it ties in directly with my early retail work of 30 years ago.

What I could have done and what I probably will do in the years to come it to simply ignore the fixation on new theory of the main journals in entrepreneurship and focus on replication and testing the experiments and the investigations of my colleagues. At my age I have the liberty to ignore what is in vogue and concentrate on what is reproducible. For those seeking to inspire entrepreneurs and who aim to support them – whether it be politicians, financiers or family members – it is crucial to know whether scholarly ideas work or not. Recent large-scale survey work in medicine and psychology that attempt to reproduce earlier results have had truly disappointing results. There is no obvious reason to assume that duplication results would be different in entrepreneurship. A parallel approach is to do research based upon multiple data sets, applying “internal replication.” In my own work I try to do so and in my editorial work I try to encourage it. Here I learned a lot from my colleagues and friends in medicine, with whom I tried to conquer the rocky terrain of entrepreneurship and biology.

9. Hello biology

Entrepreneurship is hereditary. This follows directly from the sign and the significance of the “entrepreneurial parents” variable, which is one of the usual suspects in the determinants of the entrepreneurship literature. I am inclined to say that I never saw a non-significant effect here. But how this works remained obscure until recently: is it nature or nurture? Twin studies now show that it is both. And if it is nature, which bit of DNA is responsible for the nature effect? Or in layman’s terms: which genes are responsible? Given the spectacular progress in DNA research, it is now straightforward to connect DNA to diseases and physical properties of human beings. Ten years ago it took my frustration with the progress of entrepreneurship research, despite - or thanks to - the ladder approach, to think that DNA might be the missing link. So, when I approached Bert Hofman, the principle investigator of a large research initiative at the Erasmus Medical Centre investigating the links between DNA and oft horrid diseases, with the question of whether he could make his DNA material available so that I could research the link with the entrepreneurial choice, he probably thought of entrepreneurship as yet another horrible disease. But he said yes, let’s do it. This was the beginning of a fascinating, still ongoing, research project. Bert and I immediately understood that analyzing DNA and economic behavior, such as the entrepreneurial choice, is a big and risky adventure and we surrounded ourselves with many talented people like Philipp Koellinger, Patrick Groenen, and André Uitterlinden. The entrepreneurial gene was never found [195, 146, 160, 179] but we did find some of the genes connected to educational attainment and subjective well-being and reported about it in *Science* [181], *Nature* [197] and *Nature Genetics* [199]. The collaboration between my Erasmus School of Economics and the Erasmus Medical Centre culminated in the creation of the Erasmus University Rotterdam Institute for Behavior and Biology (EURIBEB). I contributed to some of its many publications of which like the ones in *Journal of Economic Perspectives* [159] and *Physiology and Behavior* [180] the most.

The EURIBEB initiative started by investigating the links between DNA and economic behavior, but quickly broadened its scope toward the role of satisfaction and health [177, 191]. Other studies connecting entrepreneurial behavior with hormones [180], electroencephalography [190], and attention-deficit/hyperactivity (ADHD) [192, 200] followed. EURIBEB received two significant grants from my EUR: one for research on the interface between genes and economic behavior and the second on the neuro-cognition – a blend of neurocognitive mechanisms and psychopathological symptoms - of economic behavior. As a test – or rather of a proof of concept – behavior we used entrepreneurship in its many manifestations like the intention, choice, orientation, success, etc. The social sciences are at the eve of a major regime switch. The so-called social science standard model (SSSM) dominated the social sciences since they came into existence. This model dictates that human decision-making is explained using determinants like environment, socialization, demographics, traits and other behaviors. The model left no room for biological determinants. Currently, biology is making its way into the social sciences at a rapid pace. By biology we mean neuro-imaging, hormones and genetic information. It is precisely here that EURIBEB is contributing. In particular, in using genetic information it is ahead of the world-wide pack. It is also contributing in the area of using determinants originally developed to assess symptoms derived from the field of clinical and neuropsychology - in other words psychiatric scales – for non-clinical purposes. I am determined to devote my scientific life of the next five years or so to these new developments as a director of EURIBEB.

10. Looking back and ahead

My work at EURIBEB in Rotterdam on the discovery of the entirely new field of economics and biology seems not compatible with that of “directeur de la recherche” at the Montpellier Business School in France, which is largely organizational. But wait: isn’t combining the two entirely different fields of economics and biology just like combining two strikingly different cultures, like the (horizontal) Dutch and (vertical) French ones? And is that not similar to combining the scientific research of academia and the applied research of a commercial institute like Panteia, which I have been doing for nearly forty years now. And being “directeur de la recherche” will not prevent me from doing research with a biology or psychiatry *saveur* in partnership with my French colleagues to extend my modest French language output [17, 156, 167, 174, 175, 188, 196]. I do not anticipate increasing my Dutch language output in the years to come: it will probably remain at the level of two edited handbooks [71, 105], a booklet on small firms and jobs [66], 27 contributions for the Dutch (bi)-weekly *ESB*, and an assorted collection of newspaper column-type offerings.

Like many fellow researchers I learn more from my students than they do from me. I was thrilled to take over the small business course of Professor Jan van der Wilde at Free University Amsterdam in the late 1980s: I did so out of my respect for him because he had supported me when I was a young, ill-informed, economic researcher with the idea of changing the field of small business from an institutional to a scholarly one, at a time when it was dominated by vested and institutional interests. I already had this part-time chair at the Econometrics Institute EUR without any teaching obligation. So, why teach in Amsterdam? Taking on this teaching activity proved valuable when EUR upgraded my chair from a part-time temporary to a full time fixed position. I did not have to develop courses from scratch and my beginner’s mistakes were left behind in Amsterdam. Setting up my first small business course in Rotterdam was one of the most hilarious episodes of my entire career, which I am happy to share with anybody over a beer or two. Over the years I set up a Bachelor’s major “Organization and Entrepreneurship” for third year economics students, a Bachelor’s minor “Entrepreneurship in the Modern Economy” for third year students of all backgrounds and a Master’s program “Entrepreneurship and Strategy Economics.” As far as I am aware, my Erasmus School of Economics is the only school of economics in the world with such a variety of entrepreneurship programs.

The Centre for Advanced Small Business Economics (CASBEC) was established in 1987 and started as a placeholder for those working in the “conditional research financing” group on “retail econometrics.” Gradually it began showing to those involved and to the world that it was not just about inventing the field of “retail econometrics” but also about small business economics. Most importantly it was a joint effort between Panteia and the Erasmus School of Economics (ESE): a platform for the collaboration between Panteia, which brought in research questions and data sets, and ESE, which provided human capital. It is a platform coupling societal relevance and scientific rigor. There’s no document explicitly stating any regular financial support or the goals of CASBEC, rather it has always been entirely virtual. Which probably explains its longevity. It has been of great value to both partners in terms of its scholarly output, the number of PhD students who defended successfully, as well as national and international visibility for the two partners.

The Erasmus Centre for Entrepreneurship (ECE) offers a learning environment where both students and companies nurture their entrepreneurship skills, gaining new insights and turning ideas into innovations. It supports them with a combination of a strong academic environment and a community filled with experienced entrepreneurs. The ECE Campus is now home to more than 50 innovative companies and is the stage for many entrepreneurship

events. Furthermore, it built an infrastructure fostering ambitious entrepreneurship and empowering a global community of 20,000 entrepreneurs who can help solve global challenges – creatively and effectively. Currently, I am scientific director of ECE, which is mainly ornamental. But when I go there, I observe and always leave the place in an optimistic mood. It is filled with many young people, who are talented and driven, all with vision for a great future. But getting it off the ground was a gigantic exercise. I invested at least the equivalent of a full professional year in its gestation and its fragile nascent state. It was fully worth it.

The Erasmus School of Economics has always been tolerant and even generous with my field and with me. It invested in PhD students and education programs. It supported my eclectic approach of economics and went along with my life long campaign based on my alleged lack of management genes. It never gave me any managerial duties and allowed me to live far away from the organizational power center. My field, my small group and I have survived three reorganizations. The last which took place was really big and, when it was over, the size of the school appeared to have been halved from 2004 to 2006. Practically alone – but with the help of colleagues funded by external financing – I established the “Entrepreneurship and Strategy Economics” Master’s degree. Some students called it the “Roy Thurik and friends” Master’s, and it was the most rewarding teaching that I’ve ever engaged in, with incredibly involved and thankful students. External financing also played a big role for my small research group CASBEC until some ten years ago. The Dutch Ministry of Economic Affairs; VBS Schiedam Vlaardingen, a big philanthropic foundation; the Foundation for the Economic Organization of the Construction Industries; the Dutch Retail Trade Board; and many others invested in our research. A big bank and an accounting firm invested in a spinoff of CASBEC, the European Family Business Institute, but unfortunately that proved to be “too much and too early.”

Somehow we even started making money by organizing the Erasmus Master Class for Entrepreneurship and the Erasmus Master Class for Family Business. Advertised as a “Master Class for Entrepreneurs who do not need a Master Class,” the entrepreneurial course was a huge success – with entrepreneurs coming to me, I learned a lot. As did the handsomely paid professors hired to participate in the Master Class: They lost their innate inclination to see entrepreneurship as a frivolity for serious schools. However, at the time, actually being entrepreneurial and making money was not necessarily seen as a virtue. So we abandoned the initiative.

Erasmus University Rotterdam has been even more supportive than my own school. Since 2000, it has given me four major grants to develop “Small Business Economics,” the “Erasmus Centre for Entrepreneurship,” the “Erasmus University Rotterdam Institute of Behavior and Biology,” and the “Neuro-cognition of the Entrepreneur” project. These four grants amount to at least 2M euros. Without them I would have led a marginal existence at EUR and beyond.

My PhD students have played, and will continue to play, a focal role in my professional life. I always tried to recruit candidates who I thought were far cleverer than I. I hear the reader think: “that is not a strong statement in your case, Roy!” I had few drop out. I very much acknowledge the collaboration with Ben Bode, Jan van Dalen, Jeroen Potjes, Yvonne Prince, Luuk Klomp, Martin Carree, Jan de Kok, Marco van Gelderen, André van Stel, Ingrid Verheul, Sander Wennekers, Armenio Bispo, Jolanda Hessels, Hugo Erken, Haibo Zhou, Peter van der Zwan, Brigitte Hoogendoorn, Matthijs van der Loos, Niels Rietveld and Wim Rietdijk. I am confident that my current PhD students, Aysu Okbay, Pourya Darnihamedani,

Ronald de Vlaming, Indy Bernoster, Christian Fisch and Plato Leung, will all successfully defend.

Ultimately, though, there are four key colleagues: two unaware of the impact that they have had on me (at least until now, that is), and two on speed-dial. David Storey [196] and Simon Parker are the two caught unawares: David Storey's superb presentation style and fine-tuned feel for what policy needs is reflected in how I approach the application of my research. Simon Parker has benefitted financially – each of the three times I bought his book, *The Economics of Entrepreneurship*, because I'd been foolish enough to loan the previous copy of this important book to friends. On speed-dial are my ultimate collaborators, conspirators and friends, Johan Koerts, my supervisor, and David Audretsch [176], my co-author. They have two things in common. They discouraged me from moving out of the field and we seldom talked about the field, instead focusing on the personal things that make life inside and outside the office enjoyable: walking along the River Maas, drinking a pint in a beer garden, and savoring the best things in life.

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