

Schumpeter versus Kirzner: An empirical investigation of opportunity types

Jeroen P.J. de Jong
Orietta Marsili

Zoetermeer, January 2010

Dit onderzoek is mede gefinancierd door het programmaonderzoek MKB en Ondernemerschap (www.ondernemerschap.nl)

EIM Research Reports

reference number	H201004
publication	January 2010
emailaddress corresponding author	jjo@eim.nl
address	EIM Bredewater 26 P.O. BOX 7001 2701 AA Zoetermeer The Netherlands Phone: +31 79 343 02 00 Fax: +31 79 343 02 03 Internet: www.eim.nl

Voor alle informatie over MKB en Ondernemerschap: www.ondernemerschap.nl

De verantwoordelijkheid voor de inhoud berust bij EIM bv. Het gebruik van cijfers en/of teksten als toelichting of ondersteuning in artikelen, scripties en boeken is toegestaan mits de bron duidelijk wordt vermeld. Vermenigvuldigen en/of openbaarmaking in welke vorm ook, alsmede opslag in een retrieval system, is uitsluitend toegestaan na schriftelijke toestemming van EIM bv. EIM bv aanvaardt geen aansprakelijkheid voor drukfouten en/of andere onvolkomenheden.

The responsibility for the contents of this report lies with EIM bv. Quoting numbers or text in papers, essays and books is permitted only when the source is clearly mentioned. No part of this publication may be copied and/or published in any form or by any means, or stored in a retrieval system, without the prior written permission of EIM bv. EIM bv does not accept responsibility for printing errors and/or other imperfections.

Schumpeter versus Kirzner:
An empirical investigation of opportunity types

Jeroen P.J. de Jong
EIM Business and Policy Research and
RSM Erasmus University
P.O. Box 7001
2701 AA Zoetermeer
The Netherlands
phone +31(0)79 322 2268
e-mail jjo@eim.nl

Orietta Marsili
RSM Erasmus University
Rotterdam
The Netherlands

- working paper January 2010 -

Schumpeter versus Kirzner: An empirical investigation of opportunity types

Abstract

Although the identification and exploitation of opportunities is central in many modern theories of entrepreneurship, empirical investigations of opportunity types are scarce. This paper empirically explores the distinction between Schumpeterian and Kirznerian opportunities by analyzing survey data of 184 high tech small business entrepreneurs engaging in opportunity exploitation. First, a multidimensional measure is developed to document the extent in which entrepreneurial opportunities are either Schumpeterian or Kirznerian. This is assessed on five bipolar dimensions labeled as innovation-arbitrage, disequilibrating-equilibrating, creation-discovery, rare-common and new information-no new information. Next, we explore when, by whom and with what consequences both types are correlated. Schumpeterian opportunities are more likely to be pursued by innovative individuals with strong ambitions to grow their company. At the enterprise level, we find that Schumpeterian opportunities are found in organizations with a strategic focus on proactive product development to satisfy future needs, while the Kirznerian type is correlated with a strategic focus based on the exploitation of today's needs. Besides, Schumpeterian opportunities are found more often in relatively innovative organizations (i.e. new-to-the-markets product introductions, patents and university collaborations) and pursued in rapidly growing and turbulent markets, while the Kirznerian type prevail in markets with strong incumbent competition. As for their impact on business performance, Schumpeterian opportunities seem to induce better growth in terms of sales and employment. Implications are discussed.

Keywords

Opportunity types; Schumpeter; Kirzner; measurement.

INTRODUCTION

It is quite generally accepted that the concept of entrepreneurship seeks to understand how opportunities are identified and exploited. Since the seminal article by Shane and Venkataraman (2000), understanding why, when and how opportunities come into existence is an increasingly popular field of inquiry. This article suggested that although scholars widely acknowledge that theoretical development of the opportunity construct is central to entrepreneurship research, questions focusing on the origins of opportunity remain largely unanswered. Shane and Venkataraman got as far as to include it in their definition of entrepreneurship research by suggesting that research in this domain involves '...the scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered and evaluated' (2000: p. 218).

Ever since Shane and Venkataraman (2000) the number of studies of the nature of opportunities has accelerated. However, scholarly work has so far been mainly conceptual. This becomes evident in a recent special issue of *Small Business Economics* on entrepreneurial opportunity which contains only one empirical paper (see McMullen, Plummer and Acs, 2007). In fact, empirical contributions so far mainly revolved around how individuals discover or enact opportunities (Gartner, Carter and Hills, 2003) while specific opportunity types are barely dealt with. Most studies take opportunities for granted when exploring strategic and entrepreneurial processes. Consequently, it has been advised that we need to be concerned much more with researching the nature and character of opportunities, rather than just individual and environmental characteristics influencing the process of opportunity identification and exploitation (Shane, 2003: p.18).

This paper empirically explores and compares two types of opportunities that are regarded as central and opposing views on where entrepreneurial opportunities come from, i.e. the Schumpeterian and Kirznerian view (Shane, 2003; McMullen et al., 2007). In the Schumpeterian view, opportunities emerge out of the entrepreneur's internal disposition to initiate changes in the economy. The entrepreneur is considered to be an innovator who 'shocks' and disturbs the economic equilibrium during times of uncertainty, change, and technological upheaval (Schumpeter, 1934). In contrast, the Kirznerian view implies that individuals secure entrepreneurial profits on the basis of knowledge and information gaps that arise between people in the market (Kirzner, 1973; 1997). In this view, the entrepreneur is an alert person, discovering opportunities by acting as an arbitrageur or a price adjuster in the marketplace, capitalizing on knowledge or information asymmetries.

Empirical studies of when, how and by whom both types are exploited are scant. Recently, Samuelsson and Davidsson (2009) studied 259 Swedish citizens involved in the process of creating a venture. They found that the venture creation process was different for innovative versus imitative ventures. Likewise, Craig and Johnson (2006) analyzed a sample of 103 business and engineering students to investigate if individuals who are potentially involved in entrepreneurship can be identified as being innovators (Schumpeterian) or opportunity-alert (Kirznerian). They found that engineering students were as likely to be Schumpeterian entrepreneurs as their colleagues from business studies, suggesting that type of education does not make much difference.

Our purpose here is twofold. First, we investigate whether we can empirically distinguish between Schumpeterian and Kirznerian opportunities. We want to find out if both opportunity types can be empirically observed in surveys, and develop a measure that can be used in future endeavours. Second, we explored the correlates of both opportunity types. We analyzed if Schumpeterian and Kirznerian opportunities can be associated with specific entrepreneurial traits, enterprise characteristics and environmental conditions. We also tentatively explored the consequences of both types with a correlation analysis of their impact on enterprise growth.

This paper first highlights incumbent theory on Schumpeterian and Kirznerian opportunities. We identify five dimensions on which the distinction between both types can be described – providing a basis for a multidimensional measure. We proceed by briefly discussing potential correlates of both types at the level of individuals, enterprises and markets. We also develop hypotheses on the correlation with enterprise growth as a proposed outcome variable. Next, we collected data from 184 high tech small business entrepreneurs in order to develop our measure and test our hypotheses. We elaborate on the data and our exercises to develop the measure and conduct correlation analyses. The paper ends with a discussion and suggestions for future research.

TWO TYPES OF ENTREPRENEURIAL OPPORTUNITY

Shane (2003) defines an entrepreneurial opportunity as 'a situation in which a person can create a new means-ends framework for recombining resources that the entrepreneur believes will yield a profit' (p.18). He suggests that to date, the literature has offered two generally accepted explanations of where entrepreneurial opportunities come from, i.e. when and how new means-end frameworks can be created. These are known as the Schumpeterian (1934) view and the Kirznerian (1973) view, respectively. Venkataraman (1997) coined these as the strong and weak forms of entrepreneurship.

In the Schumpeterian view, the entrepreneur is pictured as initiating change through innovation and as actively creating new opportunities. Schumpeter's (1934) point of departure is the notion of innovation characterized as 'new combinations'. Thus, the entrepreneur is an individual who creates a new combination and pursues it in the market (possibly but not necessarily by forming a new firm). Schumpeter argued that changes in technology, political forces, regulation, macro-economic factors and social trends create new information that entrepreneurs can use to figure out how to recombine resources into more valuable forms. By altering the equilibrium price for resources, these changes allow those people with access to new information to purchase resources at low prices, recombine them into a more valuable form, and sell the output in the hopes of generating a profit (Shane, 2003).

In the Kirznerian view, innovation and new combinations are not necessary conditions. Nor do such opportunities require macro-economic changes related to new technology or social trends. Rather, the entrepreneur is someone who benefits from information asymmetries in incumbent markets. Kirzner's (1973) very defining characteristic is that entrepreneurs are 'able to perceive opportunities for entrepreneurial profits; that is, they are able to see where a good can be sold at a price higher than that for which it can be bought' (p. 14). Opportunities are regarded to be due to imperfect knowledge of market participants, and they can be seized by anyone discovering their existence before others have done so. Thus, in the Kirzner's view the existence of

opportunities requires only differential access to existing information. By responding to this, people can obtain resources and recombine them to sell the output in the anticipation of making a profit (Shane, 2003).

Although some researchers claim that either the Schumpeterian or Kirznerian view explains the existence of opportunities, the dominant view is that both types can be present in the economy at the same time (Holcombe, 1998; Shane and Venkataraman, 2000; Fu-Lai Yu, 2001). In order to better frame the distinction between Schumpeterian and Kirznerian opportunities, we identified five bipolar dimensions that seem to capture what both opportunity types are about (Schumpeterian anchors mentioned first):

1. innovation – arbitrage
2. disequilibrating – equilibrating
3. creation – discovery
4. rare – common
5. requires new information – no new information.

The first three dimensions are broadly accepted in the literature. The fourth and fifth dimensions were identified and added by Shane (2003). What follows is a discussion of each proposed dimension.

Innovation - Arbitrage

Schumpeterian opportunities are innovative and break away from existing knowledge, while Kirznerian opportunities are less innovative and tend to replicate existing forms (Shane, 2003: p.21). As we discussed above, in the Schumpeterian view entrepreneurs are individuals initiating change through innovation by actively creating new combinations and pursuing those in the market. Thus, innovativeness, defined as introducing new-to-the-market products, processes, organizations or raw materials, is considered a key characteristic. Boldness and persistence are supposed to enable individuals engaging in such opportunities to introduce innovations despite social resistance and skepticism. They are considered to 'lead' markets, and contrasted with many imitators who follow the innovative lead of the entrepreneur (Kirzner, 1999: p.7).

For Kirzner, innovation is not a necessary element. RAs a hypothetical, analytical device, he introduced the 'pure entrepreneur' whose 'entire role arises out of his alertness to hitherto unnoticed opportunities' (Kirzner, 1973: p. 39). The pure entrepreneur does not initially own any resources. He is an arbitrageur who buys goods or resources and is able to sell them at a profit, because he is more adept or quicker than others in responding to imperfections or changes in the market. Thus, he draws on imperfections in incumbent markets, rather than being a leading person bringing paradigmatic shifts. Recombination activities are no defining element in Kirzner's notion of opportunity. However, we remark that even Kirznerian opportunities involve innovation, as entrepreneurship can almost never involve the perfect imitation of what has been done before (Shane 2003). So, the innovativeness of Kirznerian opportunities is of a more incremental nature, i.e. new to the individual or organization rather than to the market.

Disequilibrating – Equilibrating

Both types are supposed to have different effects on economic activity. Schumpeterian opportunities are marked by disequilibrating activities due to (new to the market)

innovations. In contrast, Kirznerian opportunities are the result of equilibrating forces (by arbitrage drawing on market errors). Schumpeterian opportunities disrupt the existing system, while Kirznerian ones reinforce established ways of doing things (Shane, 2003: p. 20).

The Schumpeterian perspective starts from the point of view of markets in an equilibrium state, marked by perfect information so that prices adequately reflect the value of underlying resources. Opportunities are created by individuals outside the current economic sphere and not yet reflected in the price system - entrepreneurs pursue these opportunities by creating new combinations and bringing these into the marketplace. In so doing the entrepreneur is pushing (what might otherwise have been) an equilibrium market away from equilibrium. Thus, the essence of entrepreneurship is the ability to break away from routine, to destroy existing structures, to move the system away from the even, circular flow of equilibrium, i.e. 'for Schumpeter the entrepreneur is the disruptive (...) force that dislodges the market from the somnolence of equilibrium' (Kirzner, 2009: p.148).

When introducing his alternative view of entrepreneurship, Kirzner's primary interest was to better understand the nature of the market process and the dynamic character of market competition. He therefore contrasted his view with Schumpeter to stress that where Schumpeter's entrepreneur primarily induces change to incumbent markets, his entrepreneur had an equilibrating impact on market processes (Kirzner, 2009: p. 147). His criticism was fed by the fact that neoclassical models left no space for entrepreneurship. As long as markets are in equilibrium, means and ends are already given, and there is no scope for analyzing how they are determined. Since this is exactly the entrepreneurial function, there is no place for the entrepreneur. Kirzner rather assumed that economies are in constant disequilibrium. The main emphasis is put on the dynamic and competitive process that pushes the economy towards equilibrium. It is this process that is supposed to provide a habitat for the entrepreneur. Drawing on the work of Von Mises (1949), entrepreneurial opportunities were proposed to provide a competitive advantage to those who are first to discover and exploit them. The competitive advantage is however transient, as information on valuable opportunities diffuses and others will imitate the entrepreneurial effort. In time, increased competitive activity will erode the value of the opportunity and stabilize the market towards a new competitive equilibrium (Kirzner, 1997).

Creation – Discovery

Kirzner's approach also differs in that opportunities are not created by the innovative entrepreneur, but presupposed to already exist and to be eligible for discovery by any individual (Shane, 2003). Thus, according to Kirzner opportunities are discovered, while Schumpeterian opportunities are created.

Again, Schumpeter (1934) introduced the entrepreneur as an individual who creates a new combination and pursues it in the market. Drawing on macro-economic changes such as new scientific knowledge, social and demographic trends, or legal or regulatory changes, he/she introduces hitherto undreamt of products, or pioneers brand new methods of production, to create and open up new markets in territories that were uncharted so far. As Kirzner (1999) mentions 'the entrepreneur is pictured as generating

disturbances in a fully adjusted flowing world in which all opportunities were already exploited' (p.8).

In contrast, Kirzner requires no creation at all. Individuals simply need to be alert to price differentials that others have not yet noticed (Kirzner, 2009). The central feature of successful entrepreneurship is argued to be alertness to already existing, but as yet widely discovered opportunities. Thus, in the Kirznerian view, entrepreneurial opportunities require not the introduction of new products, nor do they demand technologically more efficient methods of production. The emphasis is on individuals who alertly notice the opportunities generated by market imperfections, arising from unanticipated independently-caused changes in underlying market circumstances. Opportunity exploitation may well result in 'me too' products or processes that others have already developed and introduced successfully to the market.

Rare – Common

Shane (2003) argues that Schumpeterian opportunities should be anticipated to be much rarer than Kirznerian ones. Their disequilibrating, 'leading' and potentially disruptive nature should make Schumpeterian opportunities more valuable, but also much rarer since they are introduced first, and initially of a unique nature – and accordingly not seen that often.

By regarding individuals engaging in opportunity exploitation as heroic change initiators in the economy, Schumpeter gave cognizance to the importance of some exceptional personal traits and motivations of the entrepreneur. He suggests that entrepreneurs are the rare breed of individuals motivated intrinsically to utilize the benefits of technological, demographic, and social changes to create upheavals in the current state of equilibrium and to introduce new products and services or new ways of working (Schumpeter, 1934).

As for Kirznerian opportunities, their equilibrating, imitative and non-creative nature suggests that this is a more common type. An everyday observation is that most opportunities are constructive to established ways of doing things (Aldrich, 1999). Likewise, innovation textbooks routinely explain that in the economy one should simply expect few breakthrough innovations relative to incremental innovation and diffusion (Tushman, Anderson and O'Reilly, 1997).

Requires new information – No new information

According to Shane (2003), the distinction between both types can be summarized conveniently by asking if opportunity exploitation involves the introduction of new information, or just differential access to existing information. We remind that in the Schumpeterian (1934) view, macro-economic changes create new information that entrepreneurs can use to figure out how to recombine resources. Entrepreneurs are by no means required to be inventive in a technological sense, but they do create opportunities by recombining resources and put them into the economic sphere. Thus, Schumpeterian opportunities are created outside the economic sphere (and not yet reflected in the price system) and pursued by bringing them into the marketplace.

In contrast, central in Kirzner's (1973) view is that the existence of opportunities requires only differential access to existing information. He explained that people use the information that they possess to form beliefs about efficiently using their resources.

Because people's decision-making and information processing frameworks are not perfect, they make errors when making decisions, which, in turn, create shortages and surpluses. By responding to these people can obtain profits. So, Kirzner's opportunities are characterized by information asymmetries, but they do not require new information.

Validation hypothesis

In order to empirically explore both types of entrepreneurial opportunity we developed a multidimensional measure. Individual entrepreneurs engaging in opportunity exploitation were asked to assess one of their recently exploited opportunities on the aforementioned dimensions. Thus, the extent in which opportunities are Schumpeterian (versus Kirznerian) was measured in terms of their innovativeness (versus arbitrage), disequilibrating nature (versus equilibrating), creativity (versus discovery), rarity (versus being common) and embodiment of new information (versus existing information). Both types are thought of as counterparts on a continuum.

A necessary condition in the validation of any multidimensional measure is that its proposed dimensions contribute to an overall construct. Simultaneously however, it is required that, though related, the dimensions reflect distinct components (Campbell and Fiske, 1959). We therefore hypothesized

Hypothesis 1: The bipolar dimensions innovation - arbitrage, disequilibrating - equilibrating, creation - discovery, rare - common and new information - no new information (1A) contribute to, and (1B) are distinct dimensions of an overall bipolar construct of opportunity type.

POTENTIAL CORRELATES

In order to explore the correlates of both opportunity types, we identified a list of variables which have been repeatedly mentioned in the literature as antecedents or consequences of Schumpeterian (or Kirznerian) opportunities. The antecedents were classified at the level of individuals, enterprises and markets, i.e. the broader environment in which the individual and his/her organization functions. As for potential consequences, we focused on the correlations between both opportunity types and longitudinal growthⁱ.

Individual level

According to Shane, one implication of the distinction between Schumpeterian and Kirznerian opportunities is that the individual-level attributes necessary for the exploitation of opportunities are different (p. 21). We identified four potential correlates including educational attainment, innovative behavior, risk-taking propensity and growth ambitions.

The potential influence of education has been discussed by Samuelsson and Davidsson (2009). They proposed that education is more important for innovative than for imitative ventures, because innovative ventures are marked by greater uncertainty and complexity. With greater complexity follows a need for a broader set of knowledge and skills, which should render general education level relatively more important. They also argued that innovative ventures, while trying to introduce hitherto untested concepts, face more severe legitimacy problems to their environment (including potential customers) which education may help to overcome by providing positive signaling value. Finally, it

ⁱ The choice of potential correlates was limited by data restrictions, as we will discuss in the next section.

was argued that in innovative ventures, highly educated individuals will be better motivated to do their best – as they are more likely to find such ventures superior to other, potentially attractive opportunities available to them. Here, we see a parallel with Schumpeterian opportunities (marked by innovativeness and greater complexity) and Kirznerian opportunities (which are more likely to be imitative ventures).

For innovative behavior, Schumpeter (1934) explicitly stressed that specific personal qualities would generate entrepreneurial activity. Amongst other traits, he mentioned that imaginativeness and the joy and creating would be helpful for entrepreneurs to implement disruptive innovations. Schumpeter implicitly recognized that the entrepreneur is an innovative person. He suggested that entrepreneurs are a rare breed of individuals motivated intrinsically to utilize the benefits of technological, demographic, and social changes to create upheavals in the current state of equilibrium and to usher new products and services or new ways of working. Thus, we expect that Schumpeterian opportunities are more likely exploited by individuals engaging in innovative behavior, defined as the ability to create and implement radically new ideas.

We also expect that individuals exploiting Schumpeterian opportunities are more inclined to take risks. Schumpeterian opportunities are innovative and break away from existing knowledge, while Kirznerian opportunities are less innovative and replicate existing business or product concepts. As a result, the risk associated with Schumpeterian opportunities should be higher (Shane, 2003: p. 21). In this vein, McMullen and Shepherd (2006) propose that both types can be distinguished in terms of individuals' willingness to bear risks. Implicitly in their conceptual paper is that in comparison with the Kirznerian type, Schumpeterian entrepreneurship is associated with higher willingness of individuals (compared to other individuals) to bear risks.

Finally, a key characteristic of Schumpeter's entrepreneur is the boldness and ambition that enables him or her to introduce innovations despite social resistance and skepticism. Schumpeter's entrepreneur may anticipate much more resistance when trying to exploit disruptive innovations. Besides, the relative uniqueness of Schumpeterian opportunities makes the accumulation of evidence about opportunities probably more difficult. As a result, the exploitation of Schumpeterian opportunities requires people with different personality in terms of independence and ambitions to change the world. Schumpeter (1934) mentioned of number of relevant traits, including the dream and the will to found a private kingdom, and the will to conquer. As a consequence, we expect that individuals exploiting Schumpeterian opportunities are more likely to have ambitions to grow their business. In all, we hypothesized

Hypothesis 2: Individuals exploiting Schumpeterian opportunities are more likely to be (2A) better educated, (2B) innovative, (2C) marked by higher risk taking propensity and (2D) ambitious to grow their business (and vice versa for individuals engaging in Kirznerian opportunities).

Enterprise level

At the level of the enterprise, we identified five variables that may correlate with the type of opportunity. These include firm size, strategic focus, new-to-the-market product introductions, patents and external innovation collaboration with universities.

In his later work, Schumpeter (1942) argued that large, established firms may be better able to invest in efforts to organize the recognition and exploitation of

Schumpeterian opportunities (cf. Schumpeter, 1942), while smaller organizations are less able to do so. If this pattern were true, then the exploitation of Schumpeterian opportunities would lie much more with people inside large, established firms than is the case with Kirznerian ones (Shane, 2003: p. 22). We therefore explored to what extent firm size matters for the type of opportunities in which enterprises engage.

We also expect that organizations exploiting Schumpeterian opportunities will have a deviant strategic focus. As Schumpeterian opportunities are marked by innovativeness and disequilibrating effects, they may well serve markets which do not exist yet. We anticipate that this type is more likely found in organizations with a strategic focus on proactive product development, to create or account for future needs that have not been very evident so far –they would have a future orientation rather than being limited to making money of today's opportunities. In contradiction, the Kirznerian type is characterized by arbitrage and discovery, and without requiring new information. Such opportunities, we reason, are more likely found in existing markets. We expect that Kirznerian opportunities are found in organizations with a different strategic focus, i.e. being more alert to today's needs of customers rather than paying much attention to or creating new future needs.

Next, as Schumpeterian opportunities are characterized by innovation, creation, rarity, new information and disequilibrating effects, we expect that enterprises exploiting such opportunities are more inclined to this more than once. Accordingly, such enterprises should be more likely to have implemented Schumpeterian opportunities before, and a positive correlation with past product introductions that were new to the market is anticipated. Kirznerian opportunities are rather marked by arbitrage, discovery, commonness, and with an equilibrating nature respecting incumbent market relationships. Here, we would expect that past new product introductions were only new-to-the-firm rather than new-to-the market.

Another distinguishing feature may be that enterprises with Schumpeterian opportunities are more likely to obtain patents. Since they benefit from new information to develop innovative and rare products, it makes sense that these opportunities are more eligible for intellectual property rights – much more than Kirznerian ones. Thus, we hypothesize that enterprises reporting Schumpeterian opportunities will report to possess patents more often than their Kirznerian counterparts.

Finally, Schumpeterian enterprises will more likely collaborate with universities and other public research organizations. By definition they benefit from new knowledge and information, and this may certainly include technological knowledge from scientific research. Technological advancement is among the main sources of opportunity mentioned by Schumpeter (1934). For Kirznerian opportunities, such collaboration is less likely. In all, we hypothesized

Hypothesis 3: Enterprises exploiting Schumpeterian opportunities are more likely to (3A) be bigger, (3B) have a strategic focus on product development to satisfy or create future needs (rather than focusing on today's needs), (3C) have past new-to-the-market product introductions, (3D) possess patents, (3E) engage in innovation collaboration with universities (and vice versa for enterprises exploiting Kirznerian opportunities).

Market level

At the level of the market in which opportunities are exploited, three potential correlates include competition between incumbent rivals, market growth and technological turbulence.

The market in which opportunities are exploited is probably relevant for the type of opportunity that is most feasible. Research has shown that some industries consistently provide more valuable opportunities than others. Eckhardt (2003) investigated the industry distribution of the Inc 500 enterprises (the fastest growing young private enterprises in the United States) and enterprises that had experienced an initial public offering, and found that some industries had a consistently higher percentage of such enterprises. Strong competition between the incumbent actors in an industry will likely enhance the recognition and exploiting of Kirznerian opportunities, as enterprises need to continuously focus on and respond to their competitors' behavior. Although there may be exceptions, in general we anticipate that the Kirznerian type will be seen relatively often in markets of strong incumbent rivalry, because such an environment is more dynamic and full of information asymmetries.

For market growth, we hypothesize a positive correlation with Schumpeterian opportunities. It has been shown that population dynamics is another source of entrepreneurial opportunity, in particular population size and population growth. Population size is a source of opportunity because many opportunities face scale economies (Davidsson et al., 1994). Besides, population growth is a source of opportunity because it increases the likelihood that scale economies will be achieved, and because it generates demand growth. This, in turn, encourages opportunity because the number of people seeking a good or service is simply greater (Shane, 2003: p.31). We reason that this will more likely enhance the Schumpeterian type because such opportunities tend to be innovative, created rather than discovered, and marked by more uncertainty, which is diminished by population size and growth.

For technological turbulence, we recall that Schumpeterian opportunities are contingent on the introduction of new information (Shane, 2003: p.22). Thus, Schumpeterian opportunities tend to show up in turbulent business environments with frequent technological changes (amongst other macro-economic trends), while this is not necessary for Kirznerian opportunities. Technological changes are an important source of (Schumpeterian) opportunity because they make it possible for people to allocate resources in different and potentially more productive ways (Casson, 1995). We therefore reason that the Schumpeterian type will be seen more often in technologically turbulent environments. Accordingly, we hypothesized

Hypothesis 4: Schumpeterian opportunities are more likely to be exploited in markets characterized by (4A) low incumbent competition, (4B) high market growth and (4C) high technological turbulence (and vice versa for Kirznerian opportunities).

Growth

Except for the potential antecedents discussed above, we explored if the opportunity types are associated with an important outcome variable, i.e. enterprise growth. The bipolar dimension disequilibrating-equilibrating suggests that most entrepreneurial opportunities would be Kirznerian ones, because most opportunities are constructive to established ways of doing things (Aldrich, 1999). In this vein, Shane (2003) reasons that

their disequilibrating nature should make Schumpeterian opportunities more valuable than Kirznerian ones. The wealth created from the exploitation of such disequilibrating opportunities should be higher than in the case of Kirznerian opportunities, and accordingly, we expect that enterprises engaging in Schumpeterian opportunities will witness better growth figures in the long run. We hypothesized

Hypothesis 5: Enterprises exploiting Schumpeterian opportunities will perform better in terms of growth than those exploiting Kirznerian opportunities.

DATA

We managed to hitch on to a survey of high tech small firms in the Netherlands. This survey was conducted by EIM, a research institute specializing in entrepreneurship and small business. On behalf of the Ministry of Economic Affairs, EIM manages a panel of high tech small firms. Such firms are focal in most Dutch innovation and entrepreneurship policies, but poorly covered in official statistics. High tech small firms are defined as active R&D-performers which intentionally develop and/or apply new technologies in their products. The panel members are active in industries such as manufacturing of machinery and equipment, chemical and pharmaceutical products, and also in services, including software developers, engineering firms and commercial R&D firms. They are only small firms (< 250 employees, usually even less 100).

We collaborated with EIM because we anticipated that the panel would contain many firms exploiting Schumpeterian opportunities. As we discussed above, Schumpeterian opportunities are expected to be rare, but high tech firms are known to engage in potentially disruptive opportunities (Grinstein and Goldman, 2006). In broader samples we would expect to find mostly Kirznerian opportunities, but in this one the division was likely to be much more even – enabling a comparison between the two opportunity types.

The survey consisted of two steps. First, EIM conducted their normal, annual telephone survey to check panel members' general information, record some general indicators, and to ask if panel members still wanted to participate. We were allowed to include screening questions to track which members had recently developed and introduced new products, and thus, had engaged in opportunity exploitation. Respondents were all owners or general managers, i.e. the business' main decision makers, and usually the person who had started the company. We first asked whether they had developed any new product in the past three years and introduced it to the market. If yes, we asked them to describe the product (open-ended question). A wide variety of products was mentioned, for example an onboard monitor and routing system for sea vessels, a filtering unit to purify drinking water, a geo-phone to explore treasures of the soil, a combined adjustable spanner for plumbers, a new type of herbal cheese, and a disinfection device for medical applications. In case respondents had developed multiple products they were asked to report their most recent example.

The telephone survey was implemented in December 2006. It targeted the full panel of 779 members. During a four-week period, EIM managed to contact 532 of them. Within this group, 429 panel members satisfied our screening criteria (recent new product introductions and willing to participate in the panel). In comparison with the full panel these respondents were not selective. Drawing on χ^2 - and t-tests we found that they did not differ from non-respondents and others that failed to pass the screening. In terms of

industry types, size classes, education level and age, significance of difference tests gave no significant results ($p > 5\%$) regardless of the distribution that we tested.

The second step consisted of a pen-and-paper survey that EIM sent out to all respondents. We were allowed to submit additional questions to those respondents that had passed the screening. In the introduction to our questions, we explicitly indicated that we were interested in the specific product (exploited opportunity) that respondents had described on the phone. The full description of the product was printed first. We then offered a semantic differential scale which involved the use of bipolar items, to record if the opportunity was either Schumpeterian or Kirznerian. In addition, the survey recorded variables as part of EIM's regular data collection procedures – including various indicators at the individual-, enterprise- and market level (all to be discussed hereafter).

Eventually, we received completed questionnaires from 184 persons, a response rate of 43 percent. Table 1 describes the sampled and responding panel members.

Table 1. Distributions of sampled and responding panel members

	<i>Sample (n=429)</i>	<i>Respondents (n=184)</i>
<i>(Size class)</i>		
1-9 employees	45%	42%
10-49 employees	41%	43%
50-> employees	<u>14%</u>	<u>15%</u>
	100%	100%
<i>(Industry type)</i>		
manufacturers of chemicals, rubbers and plastics (NACE codes 23-25)	8%	9%
manufacturers of machinery, electrical devices, transport equipment (29-34)	26%	27%
other manufacturers (NACE 15-22, 26-28; 35-37)	11%	10%
technical wholesale firms (NACE 51.8)	8%	11%
IT and telecom services (NACE 64.2; 72)	21%	19%
engineering and commercial R&D services (NACE 74.2; 73)	21%	19%
other services	<u>5%</u>	<u>5%</u>
	100%	100%
<i>(Education)</i>		
bachelor or master degree	84%	87%
<i>(Age)</i>		
in years	45.4	45.6

Again, drawing on χ^2 - and t-tests no significant differences were found between both distributions in terms of size classes ($p=.46$), industry types ($p=.55$), education ($p=.06$) and age of the respondent ($p=.75$), suggesting the absence of response bias.

MEASURING OPPORTUNITY TYPES

We created a pool of 15 items to measure if the reported opportunities were either Schumpeterian or Kirznerian. All items were inspired on the literature review and key characteristics that we previously discussed. For each of the proposed dimensions three items were formulated (we were not allowed to add any more due to space restrictions in the survey). All items were bipolar sentence completers so that respondents could report on the nature of their product, and completed on a 7-point scale. For example, we asked respondents to mark if the opportunity was either 'entirely new' (Schumpeter) versus 'applying something incumbent' (Kirzner). A full list of the items is presented in the Appendix to this paper.

Our strategy to analyze the items and develop our measure was as follows. First, we conducted a range of exploratory factor analyses (EFA) to explore feasible factor structures and remove superfluous items. Second, we performed confirmatory factor analyses (CFA) to find the best factor structure and to test our first hypothesis.

Exploratory factor analysis

Using our 15 items, pre-analysis tests for the suitability of the data for EFA were computed as recommended by Hair et al. (2007). The Kaiser-Meyer-Olkin measure of sampling adequacy was .85, and the Bartlett test of sphericity was significant at $p < .001$, indicating suitability of the data. An initial EFA was computed without iteration. We found that only four factors had eigenvalues larger than one. An additional analyses with oblique rotation suggested that the bipolar dimensions of innovation – arbitrage and creation – discovery could be merged. However, an alternative EFA that was forced to extract five factors indicated that the proposed five dimensions were feasible. Both solutions however contained some ambiguous items, so we first engaged in an item-selection process to remove confusing items. Following Hair et al. (2007) this was done one-by-one based on their factor loadings (which should preferably $> .50$ while cross-loadings should be $< .30$). Table 2 lists the selected items for the five-dimensional solution (see Appendix for the dropped items). The item-selection process induced a ten-item scale, with two items for each dimension, and explaining 83% of the variance. The table also shows that each dimension is sufficiently reliable (Cronbach's $\alpha > .70$ and mean correlation $> .40$).

Table 2. Exploratory factor analysis of opportunity type items (n=184)

This product...	factor 1 (disequilibrating- equilibrating)	factor 2 (new info-no new info)	factor 3 (creation-discovery)	factor 4 (rare-common)	factor 5 (innovation-arbitrage)
...is entirely new - ...applies something incumbent	.09	.13	-.09	.07	-.60
...is revolutionary - ...is an incremental improvement	-.02	-.02	.02	.05	-.90
...is very influential - ...has no external impact	.87	-.03	-.09	-.08	-.13
...forces others to change - ...only induces internal change	.67	.03	.05	.09	.05
...is self-created - ...is due to being alert on market opportunities	-.04	.00	-.70	.18	.05
...is primarily our own idea - ...has an external source	.06	.04	-.77	-.16	-.12
...is unique - ...is seen very often	-.01	.05	-.01	.83	-.11
...is rarely seen - ...is commonplace	.19	.00	-.10	.51	-.07
...mainly applies new knowledge - ...benefits from established knowledge	.07	.82	-.02	.00	.00
...draws on new information - ...uses existing information	-.06	.84	.02	.00	.00
Cronbach's α (of bold items)	.76	.81	.72	.76	.83
Mean correlation (of bold items)	.61	.69	.57	.61	.71

For the four-dimensional solution a similar matrix was found in which the dimensions of innovation-arbitrage and creation-discovery were merged, and in which the same items had been selected (results available from the authors on request).

Confirmatory factor analysis

Next, confirmatory factor analysis (CFA) was applied to test hypotheses 1A and 1B. As the strongest test of fit is to identify and test competing models that represent different hypothetical relationships (Hair et al., 2007), we identified three models for empirical comparison. First, a model with all items loading onto a single factor was estimated. This is a baseline model that is routinely estimated in the process of developing measures, based on the thought that the distinction between Schumpeterian and Kirznerian opportunities can be captured in a single dimension. Second, a four-factor model was run in which the items of innovation-arbitrage and creation-discovery loaded on a single factor. This model reflected our finding in the original EFA that only four dimensions had eigenvalues > 1.0. Finally, a five-factor model was estimated in which all items loaded on their presupposed dimensions. The latter models were both specified to account for empirical correlations between the five dimensions, i.e. to account for the proposed contribution of the various dimensions to an overall measure of opportunity type.

Table 3 provides the results drawing on maximum likelihood estimates. It reports absolute fit measures (GFI and RMSEA, both indicating recovery of observed correlations between the items), incremental fit measures (TLI and NFI, comparing a proposed model to a baseline one-factor model with all items having unity factor loadings) and a parsimonious fit measure (χ^2/df , indicating whether model fit has been achieved by 'overfitting' the data with too many coefficients). Reported threshold values are conservative and taken from Hair et al. (2007).

Table 3. Overall fit indices for opportunity type models (threshold values in brackets) (n=184)

<i>Model</i>	<i>Absolute fit</i>		<i>Incremental fit</i>		<i>Parsimonious fit</i>
	<i>GFI (> .95)</i>	<i>RMSEA (< .05)</i>	<i>TLI (> .95)</i>	<i>NFI (> .95)</i>	<i>χ^2/df (< 3.0)</i>
One factor	.81	.178	.65	.70	6.78
Four factors	.94	.081	.93	.92	2.20
Five factors	.96	.048	.97	.96	1.42

The results indicated that the five-factor model provides best fit. The four-factor model can be regarded as marginally acceptable, but is clearly less feasible than the five-factor model. Moreover, we found that all items loaded significantly on their proposed dimensions at $p < .001$ (output available on request). These results strongly suggest that the five dimensions contribute to an overall bipolar construct of opportunity, supporting hypothesis 1A.

To test hypothesis 1B, we followed Fornell and Larcker (1981) by comparing the average variance extracted (AVE), i.e. the average variance shared between a dimension and its items, with the variance shared with the other dimensions in a model (i.e. the squared correlation between two dimensions). Table 4 reports the correlations between the five dimensions, while the square root of the AVE is on the diagonal. Indeed, the square root of the AVE exceeds all relevant correlations, indicating that the dimensions are sufficiently distinct. Accordingly, hypothesis 1B is supported.

Table 4. Distinctiveness of the proposed dimensions of opportunity type (n=184)

	(1)	(2)	(3)	(4)	(5)
Innovation-Arbitrage (1)	.84				
Disequilibrating-Equilibrating (2)	.50**	.82			
Creation-Discovery (3)	.55**	.31**	.76		
Rare-Common (4)	.55**	.47**	.39**	.78	
New info-No new info (5)	.43**	.26**	.27**	.30*	.84

** p < .001. Square root of the Average Variance Extracted is presented on the diagonal.

CORRELATION ANALYSIS

The survey recorded many other variables as part of EIM's regular efforts to study the behavior and performance of high-tech small firms. A selection of these variables is relevant for our hypotheses 2-4, and summarized in Table 5. The table also presents descriptive statistics. Besides, as the survey was part of a wider panel study, we managed to obtain longitudinal data on business performance indicators one and two years later. After the item-selection process, the bipolar opportunity measure contained ten items. From its distribution we can conclude that the Schumpeterian type is slightly overrepresented (mean scores < 4.0). Nevertheless, the distribution across the measure is good enough to enable a comparison between both types.

At the individual level, educational attainment was assessed with a dichotomous indicator whether the respondent had at least a master's degree. Innovative behavior was measured with a four-item measure based on Scott and Bruce (1994). This measure had good reliability (Cronbach's $\alpha = .77$ and mean inter-item correlation $r = .46$). Risk-taking propensity was recorded with a measure of three items ($\alpha = .81$ and $r = .59$), inspired on the work of Gomez-Mejia and Balkin (1989). Growth ambitions was studied with a self-constructed measure of two items ($\alpha = .64$ and $r = .47$). Respondents indicated their growth ambitions in the next three years in terms of revenues and workforce. Answers were collected on a five-point scale 'not at all', 'less than 10%', 'about 10 to 25%', 'about 25 to 40%' and 'more than 40%' (coded 1 to 5). Details of all items can be found in the Appendix. As indicated, reliability levels satisfied common threshold values ($\alpha > .70$ and $r > .40$) with the exception of growth ambitions – note however that this measure contained only two items, and in such cases lower values of α are acceptable (Hair et al., 2007).

At the enterprise level, firm size was measured with the number of employees in full-time equivalents. For strategic focus, we disposed of two relevant indicators that had been collected. First, respondents indicated to what extent their strategic focus included new product development to satisfy future needs. Second, they indicated to what extent they considered opportunity exploitation to better satisfy today's needs to be part of their strategy. Both items were collected with 5-point scales ('not at all'-'to a large extent'). As for new-to-the-market product introductions, patents and continuous collaboration with universities, we used three dichotomous indicators as shown in Table 5.

At the market level, we constructed three multi-dimensional measures, inspired by the work of Kemp, Mosselman and Van Witteloostuijn (2004). Perceived incumbent rivalry was documented with two items ($\alpha = .85$ and $r = .73$). Market growth was measured with a three-item measure ($\alpha = .81$ and $r = .59$). Technological turbulence was

captured by two items ($\alpha = .76$ and $r = .61$). Again, common threshold values for reliability indices were satisfactory.

Table 5. Variables and descriptive statistics

<i>Variables</i>	<i>Description</i>	<i>Mean</i>	<i>SD</i>	<i>n</i>
(Opportunity)				
Opportunity type	Mean score of five dimensions indicating to what extent an opportunity is Schumpeterian (coded 1) or Kirznerian (coded 7)	3.09	1.06	184
Innovativeness	Mean score of two items coded 1 (innovative) to 7 (arbitrage)	3.34	1.63	184
Disequilibrating	Mean score of two items coded 1 (disequilibrating) to 7 (equilibrating)	3.26	1.27	184
Creation	Mean score of two items coded 1 (creation) to 7 (discovery)	3.26	1.66	184
Rarity	Mean score of two items coded 1 (rare) to 7 (common)	2.58	1.24	184
New information	Mean score of two items coded 1 (requires new information) to 7 (no new information)	3.00	1.51	184
(Individual level)				
Education	Respondent has completed his/her master's degree (0=no; 1=yes)	.48	.50	184
Innovative behavior	Mean score of four items on innovative behavior, coded 1 (never) to 5 (always)	4.12	.50	184
Risk taking	Mean score of three items on risk taking propensity, coded 1 (totally disagree) to 5 (totally agree)	3.82	.65	184
Growth ambitions	Mean score of two items on the respondent's growth ambitions, coded 1 (not at all) to 5 (ambition to grow by over 40%)	2.70	.88	184
(Enterprise level)				
Firm size	Number of employees in full-time equivalents	27.6	41.1	184
Strategic focus on future needs	Strategic focus: new product development to satisfy future needs, coded 1 (not at all) to 5 (to a large extent)	4.06	.78	184
Strategic focus on today's needs	Strategic focus: exploitation of opportunities to better satisfy today's needs, coded 1 (not at all) to 5 (to a large extent)	3.64	1.17	184
New to market products	New to the market product introductions in past three years (0=no; 1=yes)	.79	.41	184
Patents	Possession of patents (0=no; 1=yes)	.39	.49	184
University collaboration	Continuous innovation collaboration with universities (0=no; 1=yes)	.29	.46	184
(Market level)				
Incumbent rivalry	Mean score of two items coded 1 (totally disagree) to 5 (totally agree)	3.25	.94	184
Market growth	Mean score of three items coded 1 (totally disagree) to 5 (totally agree)	3.70	.75	184
Technological turbulence	Mean score of two items coded 1 (totally disagree) to 5 (totally agree)	3.33	.87	184
(Growth)				
Δ Size1	Annual growth of number of employees between t=0 and t=1	.047	.26	158
Δ Revenues1	Annual revenue growth between t=0 and t=1	.244	.52	158
Δ Size2	Annual growth of number of employees between t=0 and t=2	.061	.20	136
Δ Revenues2	Annual revenue growth between t=0 and t=2	.165	.33	136

Finally, to obtain a flavor of the correlations with business growth, we enriched the dataset by adding performance indicators from two follow-up surveys of the panel. More specifically, in December 2007 (t=1) and December 2008 (t=2) EIM implemented new telephone surveys in which (part of) the same respondents reported the size of their workforce (number of employees in full-time equivalents) and revenues (in Euros). We computed average annual growth percentages for the number of employees and revenues,

one and two years after we had collectedly our initial data. After matching the datasets, these indicators were available for 158 and 136 respondents, respectively.

Correlations

As a first test of hypotheses 2-4, Pearson correlation coefficients between the opportunity type scale and the various indicators are shown in Table 6. The table also presents results for each of the five bipolar dimensions, but here we will only discuss the overall measure (left-most column).

Table 6. Correlations between (dimensions of) opportunity type and individual-, enterprise- and market-level indicators (n=184)

	Schumpeterian (low) – Kirznerian (high)	Innovation (low) – Arbitrage (high)	Disequilibrating (low) – Equilibrating (high)	Creation (low) – Discovery (high)	Rare (low) – Common (high)	New info (low) – No new info (high)
(Individual level)						
Education	-.09	-.10	-.10	-.12	-.04	.04
Innovative behavior	-.19*	-.18 [^]	-.21*	-.02	-.20*	-.11
Risk taking	-.06	-.07	-.08	.07	.02	-.16 [^]
Growth ambitions	-.22*	-.20*	-.16 [^]	-.14	-.13	-.18 [^]
(Enterprise level)						
Firm size	-.07	-.05	-.10	-.12	.02	.01
Strategic focus on future needs	-.36**	-.28**	-.26**	-.32**	-.27**	-.16 [^]
Strategic focus on today's needs	.35**	.21*	.23*	.29**	.26**	.30**
New to market products	-.18 [^]	-.15 [^]	-.14	-.08	-.20*	-.09
Patents	-.25*	-.22*	-.22*	-.21*	-.13	-.12
University collaboration	-.22*	-.19 [^]	-.16 [^]	-.21*	-.07	-.15 [^]
(Market level)						
Incumbent rivalry	.21*	.21*	.12	.17 [^]	.25*	.03
Market growth	-.28**	-.28**	-.19 [^]	-.07	-.26**	-.23*
Technological turbulence	-.05	.04	.01	.00	.01	-.23*

** p < .001; * p < .01; [^] p < .05

As for the individual level variables, all indicators have their expected sign. More Schumpeterian opportunities tend to be exploited by individuals with more education, innovative behavior, propensity to take risks, and ambitions to grow their enterprise. However, the correlations for educational attainment and risk taking are not significant – so we find some first empirical support only for innovative behavior and growth ambitions (hypotheses 2B and 2D). As for education, our dichotomous indicator of having a master's degree may be too rough – in follow-up studies it is recommended to include more sophisticated measures by differentiating between multiple degrees (professional education, bachelor, doctorate, etc) and years of school attendance. For risk taking, we remark that Schumpeter (1934) himself advocated that risk taking is not an entrepreneurial trait. To him, it would be the providers of finance (capitalists) who are bearing the risk of innovation.

At the enterprise level we found some interesting correlations as well. Firm size does not seem to be a good predictor of opportunity type, so hypotheses 3A is not supported. This finding seems in line with the ongoing discussion in a related field on the question if small or large firms are better capable of innovation (known as Schumpeter Mark I and Mark II, respectively). Indeed, results in this field have so far been mixed and confusion. For the other hypotheses however, we did find initial empirical support. Schumpeterian opportunities are more likely to be exploited by enterprises with a strategic focus on proactive product development to serve future needs. They are also more likely to be innovative enterprises in terms of new-to-the-market new product introductions, patents and continuous innovation collaboration with universities. In contrast, Kirznerian opportunities are found relatively often in high tech small enterprises reporting a strategic focus on opportunities to exploit today's needs.

For the market level indicators results were partially in line with our presuppositions. The incumbent rivalry measure correlated positively with Kirznerian opportunity, while perceived market growth did the same with the Schumpeterian type (in line with hypotheses 4A and 4B). These results suggest that Schumpeterian opportunities will better prosper in dynamic environments, or alternatively, they may be easier to create in such environments. We however did not find a significant result for the technological turbulence measure, with the (rather trivial) exception of the new information dimension ($r = -.23, p < .01$).

To further explore the correlates of opportunity type, we ran a range of ordinary least squares regression models in which all indicators were entered as independently variables. Results are given in Table 7. Again, our focus is on the left-most column, but interested readers may also check the regression output for the other columns.

Table 7. Regression models of (dimensions of) opportunity type (n=184)

	Schumpeterian (low) – Kirznerian (high)	Innovation (low) – Arbitrage (high)	Disequilibrating (low) – Equilibrating (high)	Creation (low) – Discovery (high)	Rare (low) – Common (high)	New info (low) – No new info (high)
<i>Standardized parameters:</i>						
(Individual level)						
Education	.03	-.01	-.03	-.04	.04	.14 [^]
Innovative behavior	-.10	-.10	-.16 [^]	.01	-.12	-.01
Risk taking	.02	.01	-.01	.08	.09	-.11
Growth ambitions	-.03	-.02	-.03	-.06	.03	-.02
(Enterprise level)						
Firm size	-.07	-.06	-.11	-.09	-.01	.02
Strategic focus on future needs	-.25 ^{**}	-.20 [*]	-.17 [^]	-.27 ^{**}	-.19 [*]	-.07
Strategic focus on today's needs	.28 ^{**}	.13 ^{&}	.18 [^]	.24 [*]	.19 [*]	.27 ^{**}
New to market products	-.11 ^{&}	-.08	-.10	-.06	-.13 ^{&}	-.03
Patents	-.21 [*]	-.18 [^]	-.16 [^]	-.17 [^]	-.12 ^{&}	-.11
University collaboration	-.15 [^]	-.14 ^{&}	-.10	-.11	-.05	-.14 ^{&}
(Market level)						

Incumbent rivalry	.09	.10	.02	.06	.15 ^{&}	.01
Market growth	-.13 ^{&}	-.16 ^{&}	-.07	.02	-.14 ^{&}	-.13
Technological turbulence	-.04	.05	.02	.01	.00	-.20*
<i>Model fit:</i>						
Adjusted R ²	.32	.20	.15	.20	.18	.17
F-value	7.6**	4.5**	3.5**	4.4**	4.1**	3.8**

** p < .001; * p < .01; ^ p < .05; & p < .10

In general, we find that the enterprise level indicators seem the most significant correlates of opportunity type. This especially applies to the strategy indicators, but also to the possession of patents. These indicators may actually be considered as validation variables to demonstrate the criterion validity of the Schumpeter-Kirzner bipolar measure. It is also interesting to note that some of the other indicators keep their significance – for example market growth, patents and university collaborations. In future research, more sophisticated models of opportunity type need to be developed with our data in order to better explain when and by whom both types are exploited.

To obtain a first test of hypothesis 5, Table 8 shows the Pearson correlations between (dimensions of) opportunity type and the various growth indicators.

Table 8. Correlations between (dimensions of) opportunity type and growth indicators

	Schumpeterian (low) – Kirznerian (high)	Innovation (low) – Arbitrage (high)	Disequilibrating (low) – Equilibrating (high)	Creation (low) – Discovery (high)	Rare (low) – Common (high)	New info (low) – No new info (high)
Δ Size1 (n=158)	-.07	-.09	-.01	-.11	-.06	.02
Δ Revenues1 (n=158)	-.12	-.15	-.07	-.05	-.08	-.07
Δ Size2 (n=136)	-.20 [^]	-.18 [^]	-.13	-.07	-.20 [^]	-.14
Δ Revenues2 (n=136)	-.22*	-.22*	-.23*	.07	-.16	-.11

* p < .01; ^ p < .05

One year after respondents had described their opportunity to us, we found no significant correlation between opportunity type and any growth indicator. After two years however, enterprises which had reported Schumpeterian opportunities were doing better than those with Kirznerian opportunities – on both workforce and revenue growth. So, drawing on the data that had been collected two years later, hypothesis 5 is empirically supported. Follow-up descriptive statistics (available on request) suggested that after one year, enterprises with both opportunity type swere growing well, but for the Kirznerian ones, growth results collapsed in the second year while the Schumpeterian ones kept their pace more or less at the same level.

DISCUSSION

This paper measured and empirically compared Schumpeterian and Kirznerian opportunities, two types of opportunity which are broadly regarded as main and opposing explanations of how entrepreneurial opportunities are born and exploited – but that have

so far suffered from scant attention in empirical research. Our intention with this paper was twofold. First, we developed a multidimensional measure of opportunity type, in which Schumpeterian and Kirznerian opportunities were opposed on five bipolar dimensions. Second, we tentatively explored when, how and by whom both types are exploited. This is a first attempt to further enrich our knowledge of the antecedents and consequences of these opportunity types.

Drawing on survey data of 184 high tech small business entrepreneurs engaging in opportunity exploitation, we indeed found that the distinction between Schumpeterian and Kirznerian opportunities can be made empirically, i.e. both types were found. Respondents were first screened for exploiting entrepreneurial opportunities in the past three years. Next, they reported to us on the nature of these opportunities by completing a bipolar, multiple-item scale with Schumpeterian and Kirznerian opportunity features as anchor points. A ten-item measure was developed that seems to adequately capture the distinction between both types on five bipolar dimensions: innovation-arbitrage, disequilibrating-equilibrating, creation-discovery, rare-common and new information-no new information. Each dimension was operationalized by two items with good reliability. The dimensions also proved to converge to an overall construct of opportunity type (Schumpeterian versus Kirznerian), but at the same time, they were sufficiently distinct.

As for the potential antecedents and consequences, we conducted a correlation analyses drawing on multiple indicators at the individual level, the enterprise level and the market level. We found that individuals engaging in Schumpeterian opportunities are more likely to be innovative and ambitious to grow their enterprise, more than those exploiting Kirznerian opportunities. At the enterprise level, we found that Schumpeterian opportunities are more likely developed in organizations with a structural focus on new product development to satisfy future needs, while Kirznerian ones focused on opportunity exploitation to meet today's needs. Besides, Schumpeterian opportunities were pursued by relatively innovative enterprises, i.e. they can be distinguished in terms of new-to-the-market product innovations, the possession of patents, and having continuous innovation collaborations with universities. As for the environmental conditions, Schumpeterian opportunities were more often pursued in rapidly growing markets, while Kirznerian opportunities were found in markets of strong rivalry among incumbent producers. Finally, as for their impact on business performance, our first results suggest that Schumpeterian opportunities induce better growth in terms of sales and employment two years after respondents first described their opportunity to us.

Limitation and suggestions

In all, our empirical results confirm that Schumpeterian and Kirznerian opportunities are exploited by different individuals and enterprises, and in different market environments. Besides, their longer-term impact on business growth seems better for the Schumpeterian type. Although these initial results are tempting, it is too early to formulate convincing and useful implications for practitioners – simply because more analyses need to be done first.

Nevertheless, for this moment policy makers should avoid to completely ignore Kirznerian entrepreneurship in order to enhance economic growth. In most developed countries, innovation and entrepreneurship policies are biased towards Schumpeterian entrepreneurship, as this is more creative, innovative and potentially disequilibrating,

with better anticipated consequences for longer term growth and knowledge spillovers (Stam, 2008) – and indeed this is what our first empirical results suggest. However, we remark that while Schumpeter's entrepreneur seems important for discontinuous change, Kirzner's version is probably important too because they come in larger numbers, and they ensure innovation diffusion. In fact, this is what further longitudinal work on the distinction between both types should shed a light on.

For researchers, suggested implications of this paper are more straightforward, and some of them directly follow from the limitations of our research. First, more can be done to validate the empirical bipolar measure of opportunity type. It proved to be very satisfactory in terms of reliability, and convergence and distinctiveness of its dimensions. Besides, the reported empirical correlations can be regarded as first evidence of criterion validity – at least the measure correlates with many of its presupposed antecedents and consequences. For further validation we stress that application in other contexts, including broad samples of entrepreneurs rather than just high-tech ones, is merited. Researchers should also be concerned with developing and testing how the measure behaves in a full nomological network of relationships with other, theoretically related constructs. Second, we need to develop more sophisticated models of the antecedents and consequences of Schumpeterian and Kirznerian opportunities, as the correlation analyses presented here are clearly only a first step. This is an effort that we intend to do ourselves. Thirdly, we remark that in previous work, attempts have been made to fuse Kirznerian and Schumpeterian entrepreneurs. For instance, Holcombe (1998) and Fu-Lai Yu (2001) explained growth as a combination of adaptive and disruptive movements by Kirznerian and Schumpeterian entrepreneurs. Kirzner (2009) himself recently concluded that both types of opportunity are needed to understand the nature of dynamic market processes:

'In spite of the contrast with Schumpeter that I emphasized in 1973, the truth is that my understanding of the dynamic market process certainly can (and should!) also encompass the consequences of Schumpeterian entrepreneurship (...) Casual observation surely confirms Schumpeter's insights into entrepreneurial creativity (...) Apparently, there must be scope for both a creative entrepreneur (...) and a passive, alert entrepreneur (...) It seems reasonable to see the full dynamic of the capitalist system as being the outcome of two distinct kinds of entrepreneur-driven changes' (p. 148-149).

In the longer run it is recommended to further explore if and how both opportunity types interact to enhance enterprise performance and economic growth – this paper and its proposed measure provides first empirical tools for this journey.

APPENDIX: MEASURES AND ITEMS

Opportunity type

(7-point bipolar scale of Schumpeterian versus Kirznerian opportunity; items marked * were discarded)

This product...

(innovation - arbitrage)

...is entirely new - ...applies something incumbent

...is revolutionary - ...is an incremental improvement

...is full of risks - ...is on the safe side*

(disequilibrating - equilibrating)

...is very influential - ...has no external impact
...forces others to change - ...only induces internal change
...disturbs market relationships - ...respects market relationships*
(creation - discovery)
...is self-created - ...is due to being alert on market opportunities
...creates new market opportunities - ...utilizes existing opportunities*
...is primarily our own idea - ...has an external source
(rare - common)
...is unique - ...is seen very often
...is hard to imitate - ...is easy to copy*
...is rarely seen - ...is commonplace
(requires new information - no new information)
...mainly applies new knowledge - ...benefits from established knowledge
...draws on new information - ...uses existing information
...introduces new concepts - ...builds on existing concepts*

Innovative behavior

(5-point scale 'never'-'always')

I search out new technologies, techniques or products.

I generate creative ideas.

People consider me an innovative person.

I investigate and secure funds needed to implement new ideas.

Risk taking propensity

(5-point scale 'totally disagree'-'totally agree')

I never mind to engage in risky ventures.

I am willing to take risks.

I like to take a chance.

Growth ambitions

(5-point scale 'not at all', 'less than 10%', 'about 10 to 25%', 'about 25 to 40%', 'more than 40%')

In the next three years, I want to grow my revenues by... (please mark)

In the next three years, I want to grow my workforce by... (please mark)

Incumbent rivalry

(5-point scale 'totally disagree'-'totally agree')

Our market is characterized by intense competition.

Our position is threatened by other companies in our market.

Market growth

(5-point scale 'totally disagree'-'totally agree')

Our most important market is expanding rapidly.

In our market we have plenty opportunities to grow.

In our market there is huge, unexploited potential.

Technological turbulence

(5-point scale 'totally disagree'-'totally agree')

In our market products and services tend to become obsolete quickly.

In our market you need to continuously adopt new technologies to stay tuned.

REFERENCES

- Aldrich, H.E. (1999), *Organizations Evolving*, London: Sage.
- Campbell, D.T. and D.W. Fiske (1959), Convergent and discriminant validation by the multitrait-multimethod matrix, *Psychological Bulletin*, 56: 81-105.
- Casson, M. (1995), *Entrepreneurship and business culture*, Aldershot, UK: Edward Elgar.
- Craig, J.B.L. and D. Johnson (2006), Establishing individual differences related to opportunity alertness and innovation dependent on academic-career training, *Journal of Management Development*, 25(1), 28-39.
- Davidsson, P., L. Lindmark and C. Olofsson (1994), New firm formation and regional development in Sweden, *Regional Studies*, 28(4), 395-410.
- Eckhardt, J. (2003), *Industry differences in entrepreneurial opportunities*, Ph.D. Dissertation, University of Maryland, US.
- Fornell, C. and D.F. Larcker (1981), Evaluating structural equation models with unobserved variables and measurement error, *Journal of Marketing Research*, 18: 39-50.
- Fu-Lai Yu, T. (2001), An entrepreneurial perspective of institutional change, *Constitutional Political Economy*, 12(3), 217-236.
- Gartner, W.B., N.M. Carter and G.E. Hills (2003), The language of opportunity, In: Steyaert, C. and D. Hjorth (Eds.), *New movements in entrepreneurship*, Cheltenham, UK: Edward Elgar, 103-124.
- Gomez-Mejia, L.R., and Balkin, D.B. 1989. Effectiveness of individual and aggregate compensation strategies, *Industrial Relations* 28(3): 431-445.
- Grinstein, A., Goldman, A., (2006), Characterizing the technology firm: An exploratory study, *Research Policy* 35, 121-143.
- Hair, J.F., W.C. Black, B.J. Babin, R.E. Anderson (2007), *Multivariate data analysis: seventh edition*, Prentice Hall, Englewood Cliffs, New Jersey.
- Holcombe, R.G. (1998), Entrepreneurship and economic growth, *Quarterly journal of Austrian economics*, 1(2), 45-62.
- Kemp, R.G.M., M. Mosselman and A. van Witteloostuijn (2004), *The Perception of Competition Index*, EIM: Zoetermeer.
- Kirzner, I. (1973), *Competition and Entrepreneurship*, Chicago, IL, US: University of Chicago Press.
- Kirzner, I. M. (1997), Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach, *Journal of Economic Literature*, 35, 60-85.
- Kirzner, I.M. (1999), Creativity and/or Alertness: A reconsideration of the Schumpeterian entrepreneur, *Review of Austrian Economics*, 11(1-2), 5-17.
- Kirzner, I.M. (2009), The Alert and Creative Entrepreneur: A Clarification, *Small Business Economics*, 32: 145-152.
- McMullen, J.S. and D.A. Shepherd (2006), Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur, *Academy of Management Review*, 31(1), 132-152.
- McMullen, J.S., L.A. Plummer and Z.J. Acs (2007), What is an entrepreneurial opportunity?, *Small Business Economics*, 28: 273-283.

- Samuelsson, M. and P. Davidsson (2009), Does venture opportunity variation matter? Investigating systematic process differences between innovative and imitative new ventures, *Small Business Economics*, 33: 229-255.
- Schumpeter, J.A. (1934), *The Theory of Economic Development*, Cambridge, MA, US: Harvard University Press.
- Schumpeter, J.A. (1942), *Capitalism, Socialism, and Democracy*, New York: US: Harper.
- Scott, S.G., and R.A. Bruce (1994), Determinants of innovative behavior: A path model of individual innovation in the workplace, *Academy of Management Journal*, 38, 1442-1465.
- Shane, S. and S. Venkataraman (2000), The promise of entrepreneurship as a field of research, *Academy of Management Review*, 26(1), 13-17.
- Shane, S.A. (2003), *A General Theory of Entrepreneurship: The Individual-Opportunity Nexus*, Aldershot, UK: Edward Elgar.
- Stam, E. (2008), Entrepreneurship and Innovation, In: Nooteboom, B. and E. Stam (Eds.), *Micro-foundations for innovation policy*, Amsterdam University Press: Amsterdam, chapter 5.
- Tushman, M.L., P.C. Anderson and C. O'Reilly (1997), Technology cycles, innovation streams, and ambidextrous organizations: organization renewal through innovation streams and strategic change, in: Tushman, M.L. and P.C. Anderson (1997), *Managing strategic innovation and change*, New York: Oxford University Press.
- Venkataraman, S. (1997), The distinctive domain of entrepreneurship research: an editor's perspective, In: Katz, J. & R. Brockhaus (eds), *Advances in Entrepreneurship, Firm Emergence, and Growth*, Greenwich: JAI Press, 119-138.
- Von Mises, L. (1949), *Human Action*, New Haven: Yale University Press.

The results of EIM's Research Programme on SMEs and Entrepreneurship are published in the following series: Research Reports and Publikationsrapportages. The most recent publications of both series may be downloaded at: www.entrepreneurship-sme.eu.

Recent Research Reports and Scales Papers

H201003	7-1-2010	Institutions and entrepreneurship: The role of the rule of law
H201002	5-1-2010	Patterns of innovation networking in Dutch small firms
H201001	4-1-2010	Administratieve lasten en ondernemerschap
H200911	24-9-2009	Ambitious entrepreneurship, high-growth firms and macroeconomic growth
H200910	4-6-2009	Entrepreneurial exit and entrepreneurial engagement
H200909	10-3-2009	Entrepreneurship Education Monitor (EEM)
H200908	3-3-2009	Internationale samenwerking door het Nederlandse MKB
H200907	2-3-2009	The Dynamics of Entry and Exit
H200906	2-3-2009	Bedrijfsgrootteverdelingen in Nederland
H200905	2-3-2009	Start-ups as drivers of incumbent firm mobility: An analysis at the region-sector level for the Netherlands
H200904	16-2-2009	Een reconstructie van het beleidsprogramma Ondernemerschap en Starters 1982-2003: een eclecticische analyse
H200903	16-2-2009	Determinants and dimensions of firm growth
H200902	2-2-2009	The decision to innovate: Antecedents of opportunity exploitation in high tech small firms
H200901	7-1-2009	The Relationship between Successor, Planning Characteristics, and the Transfer Process on Post-Transfer Profitability in SMEs
H200825	19-12-2008	Isomorfie en het beloningspakket van werknemers in het MKB
H200824	16-12-2008	The relation between entrepreneurship and economic development: is it U-shaped?
H200823	11-12-2008	International Entrepreneurship: An Introduction, Framework and Research Agenda
H200822	11-12-2008	The two-way relationship between entrepreneurship and economic performance
H200821	5-12-2008	Spin-outs
H200820	27-11-2008	Innovative Work Behavior: Measurement and Validation
H200819	17-11-2008	Open innovation in SMEs: Trends, motives and management challenges
H200818	10-11-2008	High-Growth SMEs Evidence from the Netherlands
H200817	3-11-2008	Internationalization of European SMEs towards Emerging Markets
H200816	27-10-2008	Measuring business dynamics among incumbent firms in The Netherlands
H200815	20-10-2008	Vergrijzing van het arbeidsaanbod
H200814	16-10-2008	User Innovation in SMEs: Incidence and Transfer to Producers
H200813	30-9-2008	How Does Entrepreneurial Activity Affect the Supply of Business Angels?
H200812	16-9-2008	Science and technology-based regional entrepreneurship in the Netherlands: building support structures for business creation and growth entrepreneurship

H200811	8-9-2008	What Determines the Growth Ambition of Dutch Early-Stage Entrepreneurs?
H200810	6-8-2008	The Entrepreneurial Advantage of World Cities; Evidence from Global Entrepreneurship Monitor Data
H200809	25-7-2008	The Entrepreneurial Adjustment Process in Disequilibrium: Entry and Exit when Markets Under and Over Shoot
H200808	2-7-2008	Entrepreneurial Career Capital, Innovation and New Venture Export Orientation
H200807	24-6-2008	Twee decennia ondernemersbeleid in beeld: een jong beleidsprogramma in sociaaleconomische context geplaatst
H200806	18-6-2008	Overcoming Resource-Constraints through Internationalization? An Empirical Analysis of European SMEs
H200805	9-6-2008	Whither a flat landscape? Regional differences in Entrepreneurship in the Netherlands
H200804	19-2-2008	Samenwerken op afstand
H200803	1-1-2008	Explaining Preferences and Actual Involvement in Self-Employment: New Insights into the Role of Gender
H200802	5-6-2008	Intrapreneurship; Conceptualizing entrepreneurial employee behaviour
H200801	12-11-2008	Investigating Blue Ocean v. Competitive Strategy: A Statistical Analysis of the Retail Industry
H200723	21-12-2007	Overoptimism Among Entrepreneurs in New Ventures: The Role of Information and Motivation
H200722	21-12-2007	The relevance of size, gender and ownership for performance-related pay schemes
H200721	21-12-2007	The Role of Export-Driven New Ventures in Economic Growth: A Cross-Country Analysis
H200720	21-12-2007	Entrepreneurial exit in real and imagined markets
H200719	21-12-2007	Modelling latent and actual entrepreneurship
H200718	21-12-2007	Knowledge Management and Innovation: An empirical study of Dutch SMEs
H200717	21-12-2007	Entrepreneurship and innovation
H200716	21-12-2007	Employment Growth of New Firms
H200715	21-12-2007	Entrepreneurial Culture and its Effect on the Rate of Nascent Entrepreneurship
H200714	21-12-2007	Creative industries
H200713	19-11-2007	New Ventures' Export Orientation: Outcome And Source Of Knowledge Spillovers
H200712	29-10-2007	SME Choice of Direct and Indirect Export Modes: Resource Dependency and Institutional Theory Perspectives
H200711	24-10-2007	Family Orientation, Strategic Orientation and Innovation Performance in SMEs: A Test of Lagged Effects
H200710	15-10-2007	Drivers of entrepreneurial aspirations at the country level: the role of start-up motivations and social security
H200709	12-10-2007	Does Self-Employment Reduce Unemployment?
H200708	10-9-2007	Social security arrangements and early-stage entrepreneurial activity
H200707	11-5-2007	Competition and innovative intentions: A study of Dutch SMEs