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## Uncertainty Avoidance and the Rate of Business Ownership across 22 OECD Countries, 1976-2000

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Tinbergen Institute Discussion Paper

# Uncertainty Avoidance and the Rate of Business Ownership across 22 OECD Countries, 1976–2000

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# UNCERTAINTY AVOIDANCE AND THE RATE OF BUSINESS OWNERSHIP ACROSS 22 OECD COUNTRIES, 1976-2000

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## ABSTRACT

Persistent differences in the level of business ownership across economically developed nations have attracted the attention of scientific as well as political debate. Cultural rather than economic influences are assumed to play a decisive role. This paper deals with the influence of cultural attitudes towards uncertainty on the level of business ownership across OECD countries. *First*, the concepts of uncertainty and risk are elaborated, as well as their relevance for entrepreneurship. *Second*, cross-sectional regression analysis using data for three separate years in twenty Western countries and Japan and controlling for GDP per capita, yields evidence that in 1976 and 1988 uncertainty avoidance is *positively* correlated with the prevalence of business ownership. Possibly, a restrictive climate of large organizations in high uncertainty avoidance countries pushes enterprising individuals towards self-employment. However, in 2000 this positive correlation is no longer found, indicating that a compensating pull mechanism in countries with low uncertainty avoidance may have gained momentum in recent years. *Third*, we carry out pooled panel regressions with respect to business ownership rates in two distinct cultural country clusters for the years 1976, 1988 and 2000. In the group of high-uncertainty avoidance countries a strongly negative relationship between GDP per capita and the level of business ownership is found, suggesting that rising opportunity costs of entrepreneurship are the dominant perception in this cultural environment. In a group of low-uncertainty avoidance countries no such influence of per capita income is found, but the profits associated with being self-employed are positively associated with business ownership.

JEL-CODES: P52, Z1, M13, O11, O57.

KEYWORDS: business ownership, uncertainty avoidance, cross country study, comparative analysis of economies, cultural economics, entrepreneurship

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# UNCERTAINTY AVOIDANCE AND THE RATE OF BUSINESS OWNERSHIP ACROSS 22 OECD COUNTRIES, 1976-2000

## INTRODUCTION

The prevalence of business ownership expressed as the percentage of owner/managers of incorporated and unincorporated businesses within the labour force, differs strongly between countries. Even within the relatively homogeneous subset of the world's economically most developed nations (the OECD member countries) the diversity is considerable. In Greece almost one in five out of the labour force is a business owner whereas in Finland less than one in fifteen operates a business of their own (average rates 1972-2000).<sup>1</sup> A well-known approach explains this disparity by differences in prosperity (Kuznets, 1971). The richer the country is, the fewer business owners there are. However, the first cracks in this negative relationship appeared in the late seventies (Blau, 1987 and Acs, Carlsson and Karlsson, 1999). In fact, the negative relationship between prosperity and business ownership now seems to be breaking down in several (but not all) of the most prosperous countries, as they have shown a resurgence of business ownership rates in the past decades.<sup>2</sup> Moreover, the dominance of economic variables explaining business ownership rates has been questioned, and other explanatory factors, like culture, have been brought forward (Hofstede et al., 2004).

Slowly data material becomes available showing that business ownership rates follow some U-shaped path when related to the level of economic development (Thurik and Wennekers, 2004). The switch between the downward phase of this U-shape and the upward one has to do with the changing role of entrepreneurial activities. The role of entrepreneurship has changed dramatically, fundamentally shifting between what Audretsch and Thurik (2001) introduced as the model of the managed economy and that of the entrepreneurial economy. In particular, Audretsch and Thurik (2001) argue that the model of the managed economy is the political, social and economic response to an economy dictated by the forces of large-scale production, reflecting the predominance of the production factors of capital and (unskilled) labour as the sources of competitive advantage.<sup>3</sup> By contrast, the model of the entrepreneurial economy is the political, social and economic response to an economy dictated not just by the dominance of the production factor of knowledge - which can be identified as replacing the more traditional factors as the source of competitive advantage - but also by a very different, but complementary, factor: entrepreneurship capital, or the capacity to engage in and generate entrepreneurial activity. By and large countries move from a predominantly rural economy with a high level of business ownership to an industrial one where scale economies dominate and then again to an economy where small scale entrepreneurial activities are essential in most industries.<sup>4</sup>

Differences in the business ownership rate between countries seem to be persistent despite the U-shaped path that appears driven by the level of economic development. There is a general intuition that cultural rather than economic variables play a role explaining these differences since cultural aspects are relatively time invariant.<sup>5</sup> The present paper investigates the role of uncertainty avoidance. Elsewhere the role of variables like post-materialism and dissatisfaction is studied (Uhlaner and Thurik, 2004 and Noorderhaven, Thurik, Wennekers and van Stel, 2004).

At the individual level the decision to become a business owner can be viewed as the outcome of a process of occupational choice. This approach views agents as utility maximizers taking an occupational choice decision - to become employee or business owner - on the grounds of the utility associated with the

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<sup>1</sup> See Van Stel (2003) and Thurik and Wennekers (2004).

<sup>2</sup> See Carree, Van Stel, Thurik and Wennekers (2002) and Van Stel and Carree (2004) for an analysis of the relationship between economic development and business ownership, and Carree and Thurik (2003) for a literature survey.

<sup>3</sup> See also Audretsch and Thurik (2004).

<sup>4</sup> See Van Stel, Wennekers, Thurik and Reynolds (2004) for an example of the U-shape using data material of the Global Entrepreneurship Monitor.

<sup>5</sup> See Noorderhaven, Thurik, Wennekers and Van Stel (2004).

expected returns from the two activity types.<sup>6</sup> Personal characteristics<sup>7</sup> as well as cultural, institutional and economic conditions will influence these individual choices. An aggregation of these occupational choices at the level of countries shows the cumulative and interactive influence of the different determinants (Verheul, Wennekers, Audretsch and Thurik, 2002). In the present paper we will focus on a specific cultural determinant of business ownership, viz., uncertainty avoidance, which to date has received only scant attention.

Our *first* research question considers the concepts of uncertainty and risk and the relevance of cultural attitudes towards uncertainty for the occupational choice with respect to business ownership. What effects of uncertainty avoidance on the choice for business ownership can be assumed to exist at the individual level, and how does this influence work out at the country level? Our *second* question pertains to the direct influence of uncertainty avoidance on the prevalence of business ownership at the country level. Are differences in business ownership rates at the country level related to differences in uncertainty avoidance? Our *third* question deals with the possible indirect role of uncertainty avoidance through its influence on the relationships between economic variables and business ownership. Do differences in uncertainty avoidance alter the trade-offs between the economic costs and benefits of business ownership, and hence indirectly affect business ownership rates?

## UNCERTAINTY, RISK AND ENTREPRENEURSHIP<sup>8</sup>

### *Some classical and neoclassical views*

Since the publication in 1921 of Knight's dissertation *Risk, Uncertainty and Profit* it has become common usage in the social sciences to distinguish between risk and (true) uncertainty (Van Praag, 1999: 322). Uncertainty is a basic fact of life. We speak of uncertainty when 'anything might happen'. Relevant examples in the economic domain are new inventions and changing consumer preferences. Basically, these are unique events. Hence there is no statistical basis for calculating a probability. Risk is a special case of uncertainty. It relates to specific, unpleasant<sup>9</sup> events for which past instances may be assembled and analyzed, such as fire-damage or insolvency of debtors. Risk is often expressed in a percentage or probability and, accordingly, is to some extent insurable.

According to Knight, the entrepreneur's main function is bearing the real uncertainty by making judgmental decisions in the face of incalculable and uninsurable business hazards (Van Praag, 1999: 322-323). Knight's writings present an elaboration and generalization of Cantillon's views on entrepreneurship that were originally published in 1755 and in which the main entrepreneur's function is arbitrage between supply and demand. "As Cantillon describes it, entrepreneurs buy at a certain price to sell again at an uncertain price, with the difference being their profit or loss" (Hébert and Link, 1989: 42). Most (neo)-classical authors, including Say and Marshall, view entrepreneurs as being responsible for risk-bearing (Van Praag, 1999: 327). Later authors on entrepreneurship, particularly those in the (neo)-Austrian tradition (such as Kirzner), emphasize the entrepreneurial quality of perception of opportunities in the face of uncertainty.

By contrast, Schumpeter (1934) in his well-known *Theory of Economic Development* (reprinted in Swedberg, 2000: 58) emphasizes the innovative function of the entrepreneur, the person who introduces 'new combinations' of productive means. Schumpeter's view "disposes of the conception of the entrepreneur as risk bearer". In a footnote, Schumpeter continues: "Risk obviously always falls on the owner of the means of

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<sup>6</sup> This approach is rooted in the work of Knight (1921) and starts from the functions of the provision of entrepreneurial ability and the bearing of risks. The second function underlines the importance of risk attitudes in the occupational choice process. See, for instance, Kihlstrom and Laffont (1979) and Parker (1997) where the degree of risk aversion and the differences in risk of becoming a business owner vis-à-vis an employee are given the central role in the determination of the occupational choice.

<sup>7</sup> See Blanchflower and Meyer (1994), Blanchflower and Oswald (1998), Douglas and Shepherd (2002), Evans and Leighton (1989, 1990), Grilo and Irigoyen (2003), Grilo and Thurik (2004) and Lin, Picot and Compton (2000) for empirical work.

<sup>8</sup> There is no generally accepted definition of entrepreneurship. See Wennekers and Thurik (1999) for an overview. In the present paper we adopt a pragmatic approach by equating entrepreneurship, business ownership and self-employment, and an entrepreneur will simply be understood to be the owner/manager of either an unincorporated or an incorporated business. See also Thurik and Wennekers (2004).

<sup>9</sup> According to the Oxford Concise Dictionary, tenth edition, 1999, risk is "the possibility that something unpleasant will happen".

production, . . . ., hence never on the entrepreneur *as such*". Finally, T.W. Schultz (1975) defines "entrepreneurship as the ability to deal with disequilibria, rather than the ability to deal with uncertainty" (Hébert and Link, 1989: 46). For Schultz the bearing of risk is involved in entrepreneurship but it is "not a unique attribute of entrepreneurs".

In neoclassical economics the role of entrepreneurship is limited to the entry that follows profit opportunities (Carree and Thurik, 1995). Neoclassical economics suggests that there are a set of possible outcomes and a set of probabilities that each of these outcomes will actually occur (Varian, 1992). Then, a distinction is made between risk and uncertainty. The distribution of probabilities says something about the amount of risk. If the probabilities are not known, the term true uncertainty is used. In neoclassical economics, usually, the probabilities are assumed to be known. With regard to entrepreneurship and entry, the profit opportunities are supposed to be known and accessible to everybody. Therefore, pure uncertainty is commonly disregarded (Choi, 1993 and Wubben, 1993).

Economists like Knight and Keynes and economic schools like the Austrians and the Post-Keynesians have given uncertainty more emphasis (Wubben, 1993). They define uncertainty in similar terms, but state that "especially entrepreneurs do not know the full range of outcomes nor their possibilities of occurring" (Lachmann, in Wubben, 1993).

### *Contemporary views on risk-attitudes of entrepreneurs*

The topic of risk (i.e. chance of failure) has remained current in more recent academic literature on entrepreneurship. Kihlstrom and Laffont (1979) emphasize that individuals differ in 'risk aversion'. In their model, "more risk averse individuals become workers while the less risk averse become entrepreneurs". Likewise, Iyigun and Owen (1998) model the occupational choice between 'inherently risky entrepreneurial ventures' and relatively 'safe' alternatives such as professional activities.

Mc Grath, MacMillan and Scheinberg (1992) compare values, including attitudes towards risk and failure, of entrepreneurs (founder-managers of stand-alone businesses that were at least two years old and employed at least one other person) and non-entrepreneurs in eight nations. Entrepreneurs were found to agree more often to statements like 'start-up means risk but also excitement', whereas non-entrepreneurs agreed more to 'failure means losing face/respect'. Van Praag (1996) empirically investigates which abilities and attitudes predispose individuals to entrepreneurship. In a sample of 1,763 economically active (Dutch) adults in their early fifties in 1993, more risk averse individuals were found to have a significantly smaller probability of being a business owner or having been one in the past.

Uncertainty is particularly relevant for start-up entrepreneurs because they cannot know the full range of possible outcomes (Bhide, 1994). New business founders thus are often unable to calculate their future profits. For example, someone who plans a new outlet of an existing franchise chain might have a fair estimate of its success given the experiences with previous outlets. For new business starters this does not hold.

### *Synthesis of micro-economic views*

Uncertainty is a concept that is central to entrepreneurship, as emphasized by eminent economists such as Cantillon, Mangoldt, Knight and Keynes (Hebert and Link, 1989; Ekelund and Hebert, 1990). Without uncertainty, entrepreneurship would be unnecessary. In the East European socialist planning economies entrepreneurship was unneeded and sometimes considered as criminal because a system of complete planning was aimed at that would result in optimal resource allocation. However, since uncertainty is a fact of economic life entrepreneurs are needed to arbitrage, to take risks and to innovate (Van Praag, 1996 and Wennekers and Thurik, 1999). Entrepreneurs are considered to be the primary agents dealing with uncertainty in the economy. Entrepreneurs are called for in the fast changing economic reality of today's society (Audretsch and Thurik, 2000 and 2001). Hébert and Link (1989: 47) attempt to synthesize the many diverging views. Their 'synthetic' definition of entrepreneurship incorporates (dealing with) risk and uncertainty, perception of profit opportunities as well as innovation and change.

Uncertainty is the wider concept, encompassing both risk and opportunity. There is agreement that entrepreneurs (in the sense of business owners) make judgmental decisions in the face of uncertainty,

potentially reap the rewards of perceiving and utilizing opportunities and in the process also run the risk of losing their money and their reputation. There is also some consensus that entrepreneurs are less averse to risk, while alternative views hold that entrepreneurs are inherently more optimistic rather than less risk averse or dispose of relevant information reducing uncertainty and risk (Gifford, 2003: 37-41).

### ***Cultural traits with respect to uncertainty***

Attitudes, such as risk aversion, pertain to individuals and may show a wide variety within groups of individuals. At the 'ecological level' of nations, *cultural traits* related to these individual attitudes may be distinguished. Empirically, these traits may be derived as mean, modal or extreme values of individual observations or through a direct analysis of 'ecological data' (pertaining to national practices and achievements). Cultural traits represent a nation's 'mental programs' that are developed in socialization processes in the family in early childhood and reinforced in schools and organizations (Hofstede, 2001: xix). Accordingly, cultural traits may differ between societies.

A cultural trait that is strongly associated with individual attitudes towards risk and uncertainty is 'uncertainty avoidance'. According to Hofstede (2001: 146), uncertainty avoidance has to do with the extent to which societies tolerate ambiguity. A culture is characterized by high uncertainty avoidance when its members feel threatened by uncertain or unknown situations. People in these cultures "look for structure in their organizations, institutions and relationships, which makes events clearly interpretable and predictable" (Hofstede, 2001: 148.) In countries with weaker uncertainty avoidance "not only familiar but also unfamiliar risks are accepted, such as changing jobs and starting activities for which there are no rules". Low uncertainty avoidance thus implies "willingness to enter into unknown ventures" (Hofstede, 2001: 164). Hofstede operationalizes uncertainty avoidance using three survey questions about whether employees feel "company rules should not be broken even when the employee thinks it is in the company's best interests", about their personal expected job stability and about how often they feel nervous or tense at work.

### ***Relevance of uncertainty avoidance for explaining the business ownership rate***

Verheul, Wennekers, Audretsch and Thurik (2002) propose a broad, 'eclectic' occupational framework for explaining the prevalence of business ownership. In this framework, a distinction is made between the supply side (labour market perspective) and the demand side (product market perspective) of business ownership. At the supply side, primarily demographic, cultural and economic factors influence the occupational preferences, abilities and resources of individuals. At the demand side, it is mainly technological and economic factors that determine the opportunities for new entrepreneurs and the carrying capacity<sup>10</sup> of the market with respect to the viable number of enterprises.

Viewed from the supply side, there are contradicting hypotheses with respect to the *direct influence* of uncertainty avoidance on the rate of business ownership. One hypothesis is that low uncertainty avoidance (UAI-) stimulates business ownership. This is based on the assumption that countries with this cultural profile have relatively more individuals with entrepreneurial values and thus more entrepreneurs (see Shane, 1993, for indirect support of this hypothesis). However, the opposite could also be true, based on the reasoning that high uncertainty avoidance (UAI+) in existing firms and organizations may push enterprising individuals towards self-employment (see Baum et al., 1993, for an analogous reasoning with respect to the effect of low individualism at the country level).

Uncertainty avoidance may also have an *indirect influence* on the rate of business ownership, i.e. the level of uncertainty avoidance in a nation may influence the manner in which other variables determine business ownership. For example, the degree to which increasing per capita income leads to a perception of increasing opportunity costs of entrepreneurship (compared with well-paid, safe jobs) versus a perception of increasing entrepreneurial opportunities (more niches; need for autonomy) may well be dependent on the level of uncertainty avoidance. Likewise, high unemployment levels may be interpreted as a decrease of the opportunity costs associated with business ownership, and hence stimulate entrepreneurship, but also with

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<sup>10</sup> See Carree and Thurik (1999).



increased likelihood of failure, and therefore negatively related with business ownership levels, depending on the degree of uncertainty avoidance.

## MODEL

The dependent variable in this study is the rate of business ownership in a nation at a certain moment in time. Our major interest is the direct and the indirect contribution of uncertainty avoidance to the variance in business ownership across nations and over time. To this purpose we employ a setup developed by Noorderhaven, Thurik, Wennekers and Van Stel (2003). This model, which is based on the 'eclectic' occupational framework mentioned before, features the following independent variables.

### *Per capita income*

It has been observed in various studies that the business ownership rate tends to decrease as economies become more developed (Schultz, 1990; Yamada, 1996; see Carree et al., 2002, for an overview). A low level of prosperity usually coincides with a low wage level, implying little pressure to increase efficiency or the average scale of enterprise. Small firms in agriculture, crafts and retail trade are therefore dominant in such an economy. A major route for ambitious wage earners to increase their income, then, is to set up shop and become an entrepreneur.

Economic development subsequently leads to a rise in wages, which stimulates enterprises to work more efficiently and to reap economies of scale and scope (Chandler, 1990). Also, a declining share of agriculture and an increasing share of manufacturing diminish the opportunities for self-employment. At the supply side an additional effect of rising wage levels is an increased attraction of wage-employment, increasing the opportunity cost of self-employment (Lucas, 1978). Iyigun and Owen (1998) argue that with economic development the "safe" professional earnings will rise and fewer individuals will be willing to risk becoming a business owner.

In recent decades, statistical evidence points at a *reversal* of the negative relationship between real per capita income and self-employment at an advanced level of economic development. The employment share of manufacturing starts declining while that of the services sector keeps increasing with rising per capita income, creating new market niches and providing more opportunities for business ownership. At the supply side, social psychology hypothesises a hierarchy of human motivations, ranging from material needs to self-realization (Maslow 1970). By providing autonomy, entrepreneurship may become a more attractive occupational choice at higher levels of income.

However, this reversal is apparently not universal, witness the continued decline of business ownership in some highly developed economies such as France and Japan (Verheul, Wennekers, Audretsch and Thurik, 2002). Two opposing forces may be at play here: while rising wage levels will continue to increase the opportunity costs of self-employment, expansion of the services sector and differentiation of consumer wants will also create opportunities for new enterprises. Occupational choices in countries with weak uncertainty avoidance may be influenced more strongly by the latter effect than by the first. In strong uncertainty avoidance countries it may be the other way around. Consequently, at advanced levels of economic development we conjecture a differential impact of increasing prosperity in weak (UAI-) and in strong (UAI+) uncertainty avoidance countries. In UAI+ countries the negative relationship between the level of prosperity and the self-employment rate will be undiminished across economic development. In UAI- countries the negative relationship between prosperity and the self-employment rate will break down or even reverse after a certain turning point.

### *Unemployment*

A factor diminishing the opportunity costs of self-employment is (threat of) unemployment, particularly when unemployment benefits are low relative to (minimum or average) wages. However, when structural unemployment is very high, this may indicate bleak business opportunities and discourage business ownership (Hamilton, 1989 and Meager, 1992). Where the negative influence of rising unemployment begins to outbalance the positive effect of decreasing opportunity costs depends on a perception of uncertain future

events, and may therefore be related to the level of uncertainty avoidance in a country. Hence we expect the positive effects of unemployment to dominate in UAI- countries, and the negative effects in UAI+ countries.

### ***Expected entrepreneurial income***

A major economic pull factor is the expected entrepreneurial income versus expected wage income. Obviously, the better the prospects of entrepreneurial income as compared to the wage income of an employee, the more people will be attracted to become self-employed. However, also with respect to this relationship we hypothesize a differential impact of low versus high uncertainty avoidance. In occupational choice, the weighing of expected entrepreneurial and wage income against one another also involves an assessment of the risks involved. This pertains foremost to the risk of failure (dismissal), but also concerns the expected stability of income over time. In UAI- countries these risks will be viewed more lightly and accordingly the pull of expected entrepreneurial income will be stronger than in UAI+ countries.

### ***Demographic characteristics***

In most countries women in the labour force have a lower prevalence rate of business ownership than men (Verheul, van Stel and Thurik, 2004). A higher labour participation rate of women thus in itself means a lower overall business ownership rate. The role of population density at the national level is less obvious. Every local area needs a minimum supply of facilities in retail trade, repair and personal services. Therefore, thinly populated regions will have relatively many small retail outlets, workshops and service providers. Conversely, urban areas will give rise to economies of scale through which small-sized entrepreneurship in particularly retailing comes under pressure (Bais, van der Hoeven and Verhoeven, 1995). On the other hand, networks and other supply side factors in urban areas are conducive to new entrepreneurship in many service industries. As these factors are unrelated to the uncertainty avoidance on which we focus in this paper, but may lead to differences between the rates of business ownership between countries, we will include them as controls in our model.

### ***Time trends***

Recent decades have witnessed a worldwide diffusion of new information and communication technologies as well as a widespread tendency towards deregulation of markets. Both phenomena have created opportunities for small scale business and new entrepreneurship. Audretsch and Thurik (2000 and 2001) label this as a regime switch from 'a managed to an entrepreneurial economy'. We try to catch these developments using year dummies as controls in our analysis.

## **DATA AND METHOD**

The database used in our paper (COMPENDIA 2000.2)<sup>11</sup> contains the number of non-agricultural business owners as well as some other economic variables for 23 OECD countries and for the even years of the period 1972-2000. This database includes a unified data set of self-employment, including the owners of both the incorporated and the unincorporated businesses but excluding unpaid family workers. With respect to (expected) entrepreneurial versus wage income we use the macro-economic labour income share as a (reverse) proxy. The labour income share is defined as the sum of wages including 'imputed wage income of self-employed persons', expressed as a fraction of total income. This is admittedly a rough proxy. The 23 countries in COMPENDIA are 18 European countries (EU countries including Iceland, Norway and Switzerland) and USA, Japan, Canada, Australia, and New Zealand.

Additionally, Hofstede (2001) provides data on uncertainty avoidance for 22 of the countries mentioned above<sup>12</sup>. Uncertainty avoidance is a key variable in Hofstede's well-known study<sup>13</sup> of cultural dimensions across some 50 different nations and regions. The uncertainty avoidance index (UAI) was

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<sup>11</sup> COMParative ENtrepreneurship Data for International Analysis. See Van Stel (2003).

<sup>12</sup> No data on Hofstede's indices are available for Iceland whereas for Luxembourg there are estimates that we have used for clustering only.

<sup>13</sup> This study was first published in 1980, but the second edition published in 2001 gives more information on stability and cross-validation of the data.

computed on the basis of the country mean scores for three different survey questions already mentioned in a previous section of the present paper. Because the surveys on which the index was based were held between 1967 and 1973, the stability of the index is a crucial aspect for our study into the rate of business ownership in the years 1976, 1988 and 2000. Hofstede (2001: 34) claims that national cultures are extremely stable over time. He argues that ‘... this stability can be explained from the reinforcement of culture patterns by the institutions that themselves are products of the dominant cultural value systems’. In the long run, ‘cultures shift, but they shift in formation, so that the differences between them remain intact’ (Hofstede, 2001: 255). Chapters 2 and 4 of Hofstede’s book present abundant statistical information about the stability and reliability of the uncertainty avoidance index. Our best assessment is that this index can validly be used for explaining national rates of entrepreneurship during several decades following the measurement of the index.

We have first investigated the *direct* influence of uncertainty avoidance, by means of a regression analysis for 21 countries between uncertainty avoidance (measured around 1970) and business ownership at one subsequent moment in time, given the influence of (four years lagged) per capita income and some other control variables (also four years lagged). We have chosen the years 1976, 1988 and 2000 as separate samples to investigate the stability of these direct relationships over time.

Second, we explore the possible *indirect* influence of uncertainty avoidance on business ownership. This means that we have carried out a multiple regression analysis of the business ownership rate over the period 1976-2000 with several (four years lagged) control variables. To this purpose we have pooled the samples for 1976, 1988 and 2000 mentioned above. Since these samples are 12 years apart, they seem sufficiently independent to warrant pooling them in one regression. Our basic model regresses business ownership in 22 countries on a set of independent variables excluding uncertainty avoidance (which was measured only once, around 1970). We repeat the regressions for two separate clusters of these countries. In our dataset the following thirteen countries form the cluster<sup>14</sup> of weak uncertainty avoidance: Denmark, Finland, Germany, Ireland, the Netherlands, Sweden, Great Britain, Norway, Switzerland, USA, Canada, Australia and New Zealand. Another nine countries, i.e. Austria, Belgium, Luxemburg, France, Italy, Greece, Portugal, Spain and Japan, make up the cluster with strong uncertainty avoidance.

## RESULTS

### *Direct influence of uncertainty avoidance*

Table 1 presents the regressions of business ownership on uncertainty avoidance in three separate sample years (21 countries in 1976, 1988 and 2000) including the most relevant control variables. The results for 1976 and 1988 are roughly similar. The main finding for these two samples is a significantly *positive* influence of uncertainty avoidance on the rate of business ownership. Apparently, Baum’s hypothesis stating that dissatisfaction with a climate of strong uncertainty avoidance in large organizations may push enterprising individuals towards self-employment was dominant in these years. While there is a significant partial (bivariate) *negative* correlation between lagged per capita income and business ownership (correlation approximately  $-0.5$ , significant at 5% level), no significant result is found in the regressions, which may be due to multi-collinearity with uncertainty avoidance (correlation around  $-0.5$ , significant at 5%). Furthermore, in both regressions female labour participation has the expected negative sign (significant at 10% in 1976, but not quite significant in 1988).

The regression results for 2000 are different. The main outcome is that uncertainty avoidance is no longer found to have a significant influence on business ownership. Our interpretation would be that the advent of the entrepreneurial economy in recent years, as discussed in the Introduction, has created new pull factors mobilizing the relatively abundant supply of potential entrepreneurial capital in countries with low uncertainty avoidance. So Baum’s push hypothesis for high uncertainty avoidance and Shane’s pull hypothesis for low uncertainty avoidance may now be equally valid, effectively countervailing one another in the regression. Another possible explanation could be that the measurement of uncertainty avoidance (which was carried out around 1970) has lost some of its validity 30 years onwards, but the arguments discussed in the Data section offer no specific support for this interpretation. With respect to the other explanatory variables it

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<sup>14</sup> The clustering was carried out with the K-means algorithm. See Noorderhaven et al. (1999).

may be observed that the negative impact of per capita income is now almost significant at 10% level, while female labour participation keeps the expected significant negative sign.

We conclude that there is some evidence that in recent years a pull towards entrepreneurship in a climate of *low* uncertainty avoidance has gained dominance vis-à-vis a longstanding historical push effect of *high* uncertainty avoidance. We have also found some support for the well-known observation of a negative bearing of per capita income on business ownership. However, the fact that uncertainty avoidance and per capita income are (negatively) correlated hampers a valid analysis of their isolated effects.<sup>15</sup>

### ***Indirect influence of uncertainty avoidance***

Table 2 shows our results of the pooled panel regressions (in 1976, 1988 and 2000) for all 22 countries, as well as for the cluster of nine UAI+ countries and that of thirteen UAI- countries. Regarding the set of all countries (column 1), per capita income has a strong (and highly significant) negative impact on business ownership. The effect of female labour participation is also negative and significant. The positively significant year dummies for 1988 and 2000 give support for the assumption of worldwide trends stimulating entrepreneurship. Also, in a regression without these dummies (not in table 1) the results for per capita income and female labour participation are weaker, suggesting a missing variable.<sup>16</sup>

In the UAI+ countries (column 2), GDP per capita was again found to have a very strong negative effect on the rate of business ownership. Also a positive (and nearly significant) effect of the labour-income share was found, possibly indicating reversed causality to be more likely in these countries. A very high rate of self-employment may cause the average scale of operations to remain below optimum, resulting in large numbers of ‘marginal’ entrepreneurs, who hardly make any profits (Carree, Van Stel, Thurik and Wennekers, 2002).<sup>17</sup>

In the thirteen UAI- countries (column 3), GDP per capita seems to have no systematic effect on business ownership. Also, in these weak uncertainty avoidance countries the labour-income share was found to have the expected negative (and nearly significant) effect.

We interpret our findings as supporting our general hypothesis that rising opportunity costs of entrepreneurship are the dominant perception in a cultural environment of strong uncertainty avoidance, while rising opportunities are the main perception in an environment of weak uncertainty avoidance. This is primarily based upon the strongly different effect of per capita income on entrepreneurship across the two clusters of strong versus weak uncertainty avoidance. To a lesser extent, this interpretation is also based upon our empirical results somewhat supporting the predicted differential effect of profitability on entrepreneurship across the two clusters. In sum, our findings support the hypothesis that uncertainty avoidance has a negative impact on entrepreneurship, be it an indirect one.

## **CONCLUSIONS**

The prevalence of entrepreneurship, expressed as the percentage of business owners within the labour force, differs strongly between countries. The causes of this disparity are not only economic but also stem from cultural differences between countries (Hofstede et al., 2004 and Noorderhaven et al, 1999). The persistence of the country differences throughout the economic cycles points at cultural determinants which themselves are relatively constant per country. Also, their persistence despite a U-shaped development of

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<sup>15</sup> Additionally, there is a possibility that uncertainty avoidance and per capita income interact. However, in model specifications including interaction term (the multiplication of the two variables), this interaction variable is never significant, and adjusted R<sup>2</sup> values are lower than simpler specifications which include one of the two variables separately. In the latter type of regressions, compared to table 1, the effect of per capita income increases for the 1976 and 1988 samples, while the effect of uncertainty avoidance increases for the 2000 sample (effect remains insignificant though), implying that the positive effect of uncertainty avoidance is dominant in the 1976 and 1988 estimations while the negative effect of per capita income is dominant in the 2000 estimation. We conclude that the results from table 1 suffer to some extent from multicollinearity but interaction between the two variables does not seem to play a role.

<sup>16</sup> The difference between the estimates in the two regressions is significant at 5% level for per capita income and significant at 10% level for female labour participation.

<sup>17</sup> In this respect, Greece is a striking example. Greece combines a high self-employment rate with a labour income share above one, indicating that the *imputed wage income* for the self-employed persons is higher than the *actual total income* of the self-employed.

entrepreneurship prevailing in many countries and related to both the level of economic development and time trends points in this direction.

Using a dataset of a large number of OECD countries, for the years 1976 and 1988 we have found a positive *direct* influence of uncertainty avoidance on business ownership rates, indicating that a climate of strong uncertainty avoidance in existing firms and organizations may push enterprising individuals towards self-employment (Baum's hypothesis, as discussed before). These findings also show that a personal trait (risk aversion) and its related cultural characteristic (uncertainty avoidance) may have a diverging impact on entrepreneurship. However, for the year 2000 the main outcome is that uncertainty avoidance no longer has a significant direct influence on business ownership. Our interpretation would be that the advent of the entrepreneurial economy in recent years has created pull factors mobilizing the relatively abundant supply of potential entrepreneurial capital in countries with low uncertainty avoidance. So in recent years a pull towards entrepreneurship in a climate of *low* uncertainty avoidance has gained dominance vis-à-vis a longstanding historical push effect of *high* uncertainty avoidance.

The *indirect* influence of this cultural variable was also found to be complex. In a group of nine high-uncertainty avoidance countries the expected strong negative relationship between GDP per capita and the level of business ownership was indeed found, suggesting that rising opportunity costs of entrepreneurship are the dominant perception in this cultural environment. On the other hand, in a group of thirteen low-uncertainty avoidance countries the negative relationship between business ownership and per capita income seems to have broken down. Instead, the profits associated with being self-employed appear to be a pull factor. A closer look at the underlying development of the business ownership rate in all 22 countries between 1972 and 2000 reveals the following. In the group of low-uncertainty avoidance countries, eleven out of thirteen nations show either a more or less U-shaped or a continuously upward trend in entrepreneurship, one shows a stabilization in the last fifteen years (Denmark), while only one (Norway) shows a decreasing trend. In the group of high-uncertainty avoidance countries, three out of nine countries (France, Japan and Luxemburg) show a strongly decreasing trend, while six show an increase or a U-shape, sometimes followed by stabilization. While the large number of countries with rising business ownership rates in both groups are witness to a worldwide trend toward more entrepreneurship related to ICT and deregulation, the differences between the two groups also suggest that in modern service economies high uncertainty avoidance may hamper the exploitation of new economic opportunities and thus may have a negative indirect impact on business ownership.

Our study has some limitations that should be borne in mind when interpreting the results. First, the low explanatory power of most of our regressions suggests that there may still be important explanatory variables missing from the analysis. Several recent publications suggest that other cultural, psycho-sociological and institutional variables may also play a role<sup>18</sup>. Secondly, our paper only studies the effect of uncertainty avoidance on the *level* of entrepreneurship. It would be relevant to repeat the study for the *dynamics* of entrepreneurship, although a lack of time series of harmonized business start-up data across countries may hamper the latter at least in the near future.

Nonetheless, the present results may already have some relevance for policymakers trying to promote entrepreneurship. While we would not advocate social engineering, the results do suggest that countries may see reason to scrutinize to what extent their educational system and relevant labour market, social and fiscal legislation foster a low or a high degree of uncertainty avoidance within the population.

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<sup>18</sup> This includes individualism (Shane, 1993), post-materialism (Uhlener and Thurik, 2004), dissatisfaction (Noorderhaven et al., 2004), as well as personal income tax rates, social security contributions and the unemployment benefit replacement rate (Parker and Robson, 2003).

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**Table 1 The *direct* influence of uncertainty avoidance on business ownership, separate samples 1976, 1988 and 2000 (21 countries)**

	1976	1988	2000
Constant	15.335 * (5.490)	17.113 # (8.527)	41.885 ** (12.246)
Unemployment	-0.084 (0.272)	0.044 (0.194)	-0.098 (0.200)
GDP per Capita	-0.102 (0.230)	-0.003 (0.275)	-0.382 (0.236)
Female Labour Share	-0.221 # (0.113)	-0.266 (0.169)	-0.552 * (0.241)
Population Density	-0.005 (0.005)	-0.009 (0.007)	-0.007 (0.006)
Uncertainty Avoidance	0.062 * (0.027)	0.071 # (0.034)	0.020 (0.033)
N	21	21	21
Adjusted R <sup>2</sup>	0.393	0.295	0.378

Dependent variable: number of non-agricultural business owners per labour force.  
Standard errors are between brackets. # p<.10; \* p<.05; \*\* p<.01; \*\*\* p<.001.

**Table 2 The *indirect* influence of uncertainty avoidance on business ownership, pooled samples for 1976, 1988 and 2000 (22 countries)**

	All Countries	Strong Uncertainty Avoidance Countries	Weak Uncertainty Avoidance Countries
Constant	22.446 *** (6.100)	13.633 (10.389)	26.944 *** (7.276)
Labour-Income Share	0.009 (0.060)	0.127 (0.087)	-0.105 (0.085)
Unemployment	-0.066 (0.110)	0.102 (0.155)	0.032 (0.152)
GDP per Capita	-0.474 *** (0.117)	-0.673 *** (0.157)	-0.055 (0.184)
Female Labour Share	-0.230 ** (0.082)	-0.235 (0.139)	-0.244 * (0.102)
Population Density	-0.003 (0.003)	0.010 (0.006)	-0.008 * (0.004)
Year dummy 1988	3.409 ** (1.203)	1.993 (2.055)	1.934 (1.550)
Year dummy 2000	6.626 *** (1.538)	5.813 * (2.229)	3.962 # (2.090)
N	66	27	39
Adjusted R <sup>2</sup>	0.314	0.524	0.216

Dependent variable: number of non-agricultural business owners per labour force.  
Standard errors between brackets. # p<.10; \* p<.05; \*\* p<.01; \*\*\* p<.001