



Research Report H200202

Post-Materialism as a Cultural Factor Influencing Entrepreneurial Activity across Nations

Lorraine M. Uhlaner*

Roy Thurik**

Jan Hutjes***

* Erasmus University Rotterdam (CASBEC), EIM Business and Policy Research
Zoetermeer and Eastern Michigan University

** Erasmus University Rotterdam (CASBEC), EIM Business and Policy Research
Zoetermeer

*** M&T Consult and EIM Business and Policy Research Zoetermeer

Zoetermeer, August 2002



SCALES

Scientific Analysis of Entrepreneurship and SMEs

ISBN: 90-371-0861-X
Ordernumber: H200202
Price: € 20.-

This report is part of the research programme SMEs and Entrepreneurship, which is financed by the Netherlands Ministry of Economic Affairs.

Acknowledgement: *We would to thank Marco van Gelderen, Peter van Hoesel, André van Stel, Ingrid Verheul and Sander Wennekers for helpful comments. Earlier versions have been read at the SBEDC conference, Nottingham, UK, April 2002, the Babson BKERC conference, Boulder, Co, June 2002 and the ICSB world conference, San Juan, Puerto Rico, June 2002. The present report has been written in the framework of the research program SCALES (Scientific AnaLysis of Entrepreneurship and SMEs) which is carried out by EIM and financed by the Dutch Ministry of Economic Affairs. We would also like to thank Jacques Niehof and Hanneke van de Berg for their contributions to earlier versions of this paper. An earlier version of the present paper appeared as ERIM report ERS-2002-62-STR.*

Correspondence: *Lorraine Uhlaner, CASBEC, Rotterdam School of Economics, room H8-20, Erasmus University Rotterdam, P.O. Box 1738, 3000 DR Rotterdam, Netherlands, uhlaner@few.eur.nl.*

The responsibility for the contents of this report lies with EIM. 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.

EIM does not accept responsibility for printing errors and/or other imperfections.

Contents

	Summary	5
1	Introduction	7
2	Past research on level of entrepreneurship at the aggregated society level	9
2.1	Push versus pull factors as influences on entrepreneurship	9
2.2	Economic influences on rate of entrepreneurship	9
2.3	Culture and entrepreneurial behaviour	10
3	The Model and Hypotheses	13
3.1	Post-materialism and level of entrepreneurship	13
3.2	Economic factors as control variables and level of entrepreneurship	13
3.3	Other cultural factors as control variables and level of entrepreneurship	14
4	Research method	17
4.1	Data and variables	17
4.2	The sample	17
4.3	Data Analysis	17
5	Results	19
5.1	Validation of the aggregation of data across time	19
5.2	Prediction of self employment	19
6	Discussion	21
7	Conclusion	23
	References	25
	Appendices	
1	Source and Measurement of Variables	29
2	Correlations	31

Summary

The study of the determinants of entrepreneurship at the country level has been dominated by economic influences. The relative stability of differences in levels of entrepreneurship across countries suggests that other forces such as certain institutional and/or cultural factors are at play. The objective of this paper is to explore how post-materialism explains differences in entrepreneurial activity across countries. Entrepreneurial activity is defined as the percent of a country's population that is self-employed, using a broad definition that also includes CEOs of both unincorporated and legally incorporated establishments. The measure for post-materialism is based upon Inglehart's four-item post-materialism index. Because of the known interactions between economic and cultural factors found in previous research, a set of economic and cultural factors is included to provide a clearer picture of the independent role post-materialism plays in prediction of self-employment levels. In particular, education, life satisfaction, church attendance and political (left or right) extremism are used as control variables in our analyses using data of 14 OECD countries over in recent period. Findings confirm the significance of post-materialism in predicting self-employment even when controlling for economic and cultural factors. However, strong covariation between post-materialism and other cultural factors makes it difficult to clearly discriminate between the effects.

1 Introduction

In the late twentieth century, entrepreneurship re-emerged as a key agenda item of economic policy makers across Europe, both for specific nations as well as for the European Union as a whole (Brock and Evans, 1986; OECD, 1998; European Commission, 1999; EZ, 1999; Carree and Thurik, 2002). Moderate economic growth coupled with persistently high levels of unemployment stimulated expectations of entrepreneurship's potential as a source of job creation and economic growth (Acs, 1992; Thurik, 1996, Audretsch and Thurik, 2000). This has not always been the case. For instance, in the early and mid twentieth century - in fact until the 1980s - a focus on entrepreneurship was absent from the European economic policy agenda. The exploitation of economies of scale and scope was thought to be at the heart of modern economies (Teece, 1993). Audretsch and Thurik (2001) characterize this period as one where stability, continuity and homogeneity were the cornerstones and thus label it the '*managed economy*'. Small businesses were considered to be a vanishing breed.

The late twentieth century witnessed massive downsizing and restructuring of many large firms as well as the decline of the centrally-led economies in Central and Eastern Europe built on certainty and the virtues of scale. By the 1980s evidence mounted to demonstrate that this move away from large firms toward small, predominantly young firms was a sea-change, not just a temporary aberration of the 1990s. Audretsch and Thurik (2001) label this new economic period, based less on the traditional inputs of natural resources, labor and capital, and more on the input of knowledge and ideas, as the '*entrepreneurial economy*'. Paradoxically, the increased degree of uncertainty creates opportunities for small and young firms, and hence leads to higher rates of entrepreneurship. Further study shows that this change does not take place in all developed economies at the same time or to the same degree (Audretsch, Thurik, Verheul, Wennekers, 2002). Hence comparative research may explain these variations (Reynolds, Hay, Bygrave, Camp and Autio, 2000, Wennekers, Thurik, and Uhlaner, 2002).

Although the focus has concentrated primarily on economic factors, a different strand of research includes sociological indicators such as culture and institutions. For instance, post-materialism, first coined by Inglehart (1977, 1990, 1997), describes the degree to which a society places immaterial life-goals such as personal development and self-esteem above material security. The objective of this paper is to explore whether post-materialism explains differences in entrepreneurial activity across countries. In particular, we investigate to what degree economic or cultural variables including post-materialism dominate the explanation of entrepreneurial activity at the country level.

For the purpose of the present exploratory study, entrepreneurial activity is defined as the percent of a country's population that is self-employed, using a broad definition that also includes CEOs of multi-employee establishments. Though not an ideal measure of entrepreneurship, self-employment has the advantage that it is readily available as a comparable measure across a large number of countries and a long period of time (Wennekers and Thurik, 1999). In the majority of the analyses, data of 14 OECD countries are used for 1982 and 1990.

Section Two of the paper provides an overview of the models used to explain cross-country differences. It also provides a review of the cultural factors thought to influence the rate of entrepreneurship at the aggregated societal level. Section Three presents the model and hypotheses tested in this paper. Sections Four through Seven present the Method, Results, Discussion and Conclusion sections, respectively.

2 Past research on level of entrepreneurship at the aggregated society level

The rate or level of entrepreneurship at the societal level depends upon the opportunities provided by the environment as well as the capabilities and preferences of the population. These aspects in turn are influenced by available technology, level of economic development, culture, institutions and the demography of a society. The focus of this section will be primarily on the economic and cultural factors. A further elaboration of these issues is also discussed in an 'eclectic' theory of entrepreneurship proposed by Verheul, Wennekers, Audretsch and Thurik (2002) and by Wennekers, Thurik, and Uhlaner (2002).

2.1 Push versus pull factors as influences on entrepreneurship

Applicable to both economic and cultural factors is the notion of push and pull factors for business start-up and entrepreneurship in general (Stanworth and Curran, 1973 in Wennekers, Noorderhaven, Hofstede and Thurik, 2002). Pull factors are concerned with the expectation of being better off as an entrepreneur. Individuals are often attracted to self-employment with the expectation that it will provide greater material and/or nonmaterial benefits. Push factors take into account the conflict between one's current and one's desired state. Push factors are often associated with some level of dissatisfaction. Huisman and de Ridder (1984) report that frustrations with previous wage-employment, unemployment and personal crises are among the most cited motives of a large sample of entrepreneurs in eleven different countries. Van Uxem and Bais (1996) find that 50% of almost 2000 new Dutch entrepreneurs mention dissatisfaction with their previous job among their motives to start for themselves. At the macro level, Wennekers, Noorderhaven, Hofstede and Thurik (2002) also find support for push factors of entrepreneurship, as measured by self-employment as a percentage of the labor force. In particular, they find higher self-employment in countries with less prosperity (lower per capita GDP), greater dissatisfaction with society and lower life satisfaction.

2.2 Economic influences on rate of entrepreneurship

Early models focused primarily on economic factors to explain differences in entrepreneurship across nations. Blau (1987) uses data on the American labor force to identify which factors caused this growth. He highlights two key factors: changes in technology and industrial structure. He suggests that these structural changes diminished the comparative advantage of larger firms (scale advantages) and created better opportunities for small firms as their survival became less dependent on their scale based on economic factors alone. In his general equilibrium model of self-employment he assumes that workers try to maximize the utility of income.

In the economic literature, other explanations for the rebound in self-employment in the late twentieth century are based on supply factors such as tax rates, unemployment, competition and female labor participation (Blau, 1987; Blanchflower and Oswald, 1994; Blanchflower, 2000; Evans and Leighton 1989; Meager 1992, Acs, Audretsch and Evans, 1994; Audretsch, Thurik, Verheul and Wennekers, 2002). Acs, Audretsch and Evans (1994), for instance, conclude that self-employment decreases with an increase in

per capita GNP, female labor force participation, and the relative importance of manufacturing. They also conclude that self-employment increases with an increase in the relative importance of the service sector. Audretsch, Carree and Thurik (2001) assume a two-way causation between changes in the level of entrepreneurship and that of unemployment-- a 'Schumpeter' effect of entrepreneurship reducing unemployment and a 'refugee' or 'shopkeeper' effect of unemployment stimulating entrepreneurship. They try to reconcile the ambiguities found in the relationship between unemployment and entrepreneurship by introducing a two-equation model where changes in unemployment and in the number of business owners are linked to subsequent changes in those variables for a panel of 23 OECD countries over the period 1974-1998. The existence of two distinct and separate relationships between unemployment and entrepreneurship is identified including significant 'Schumpeter' and 'refugee' effects. Carree, van Stel, Thurik and Wennekers (2002) take a different approach and investigate the relation between the level of economic development and the degree of entrepreneurship. See Wennekers and Thurik (1999), Audretsch, Carree and Thurik (2001) and Carree, van Stel, Thurik and Wennekers (2002) for some literature surveys of the role of entrepreneurship at the country level.

2.3 Culture and entrepreneurial behaviour

Though the economic factors influencing self-employment are clearly important, they do not address the possible impact of culture either directly on self-employment or indirectly as an influence on these economic factors. Moreover, there remains a high level of unexplained variation across countries when only economic variables are taken into account. Thus, more recently, researchers have also looked toward cultural factors to explain this variation. This section reviews the basic terminology used with respect to culture, how it has been applied to entrepreneurship research, and finally how the variable of post-materialism may be thought to influence entrepreneurial activity.

2.3.1 *Definition of culture*

Kroeber and Parson (1958, p. 583) define culture as 'patterns of values, ideas and other symbolic-meaningful systems as factors in the shaping of human behaviour.' Barnouw (1979, p. 5) defines culture as configurations of 'stereotyped patterns of learned behaviour which are handed down from one generation to the next.' Hofstede (1980, p. 25) refers to culture as 'the collective programming of the mind which distinguishes the members of one human group from another and includes systems and values.' Since values are typically determined early in life (Hofstede, 1980; Barnouw, 1979) they tend to be 'programmed' into individuals resulting in behaviour patterns consistent with the cultural context and enduring over time (Hofstede, 1980; Mueller and Thomas, 2000). Since extensive research at the psychological level shows a link between values, beliefs and behaviour, it is plausible that differences in culture, in which these values and beliefs are imbedded, may influence a wide range of behaviours including the decision to become self-employed rather than to work for others (Mueller and Thomas, 2000).

Culture can be defined for a variety of levels or systems in society with potential interactions between levels. Ulijn and Weggeman (2001) identify four different cultures: occupational or professional culture (PC), organizational or corporate culture, branch or industry culture (BC) and national culture (NC). Then there are those that argue that due to shifting national borders, at least as important if not more important is the concept of culture as defined by a civilization. Huntington (1996) identifies five or six contemporary civilizations: Sinic, Japanese, Hindu, Islamic, Orthodox, Western, and African (possi-

bly), with Western further subdivided into three components: Europe, North America, and Latin America. At each level of culture, one can identify distinct values, norms, language and symbols. Though all these layers are important, differences in cultures may be explained in turn by variations in influences from ancient and modern civilizations from which these national cultures derive (Huntington, 1996).

Since extensive research at the psychological level shows a link between values, beliefs and behaviour, it is plausible that differences in national culture, in which these values and beliefs are imbedded, may influence a wide range of behaviours including the decision to become self-employed rather than to work for others (Mueller and Thomas, 2000). Using this logic, several past studies explore the relationship between various aspects of culture and entrepreneurial behaviour across cultures (Busenitz, Gómez and Spencer, 2000; Davidsson, 1995; Huisman, 1985; Lee and Petersen, 2000; McGrath and MacMillan, 1992; Mueller and Thomas, 2000; Tiessen, 1997; Wennekers, Noorderhaven, Hofstede and Thurik, 2002).

2.3.2 *Views regarding the relationships between cultural values and entrepreneurial behaviour*

Davidsson (1995) identifies two overall views regarding the relationship between cultural values and entrepreneurial behaviour. The first, the *aggregate psychological trait* explanation for entrepreneurship, is based on the idea that if a society contains more people with entrepreneurial values, more people will be entrepreneurs. Davidsson notes that this is essentially the perspective taken by McClelland (1961) and other proponents of the individualistic view of culture. Davidsson also identifies a second view, first set forth by Etzioni (1987) referred to as *social legitimation*. This latter view assumes that variation in entrepreneurship is based upon differences in values and beliefs between the population as whole and potential entrepreneurs. It is precisely the clash of values between the groups that drives potential entrepreneurs away from the average organization and into self-employment (Wennekers, Noorderhaven, Hofstede and Thurik, 2002).

2.3.3 *Post materialism and the cultural dimension*

Though perhaps less well known than the cultural indices developed by Hofstede (1980), Inglehart (1977; 1990; 1997) has carried out extensive research using another cultural concept referred to as post-materialism. In order to explain observed changes in values in modern societies Inglehart proposed the materialism/post-materialism hypothesis. The post-materialism hypothesis describes the transformation in many countries from a culture dominated by more materialistic-oriented individuals to a society in which an increasing proportion of the population prefers non-materialistic life-goals above materialist ones. The hypothesis of post-materialism is based in turn on two sub-hypotheses, that of *socialization* and that of *scarcity*. The socialization hypothesis assumes that someone's values reflect to a great extent the prevailing circumstances during his or her formative years. The scarcity hypothesis assumes that someone's priorities reflect his or her socio-economic circumstances; therefore someone attaches the greatest value to relatively scarce goods. Taken together these two hypotheses imply that, as a consequence of the unprecedented prosperity and the absence of war in Western countries since 1945, younger birth cohorts attach less importance to economic and physical security (materialistic values) than older birth cohorts who experienced poverty in their early years. Instead, younger birth cohorts give higher priorities to non-material goals such as esteem, self-realization and quality of life (post-materialistic values) often referred to in the psychology literature as Maslow's 'higher order needs' (Maslow, 1954).

In his research, Inglehart's findings also support the conclusion that due to intergenerational replacement a gradual shift takes place from materialistic priorities to post-materialistic goals in western countries. A consequence of this shift is a declining emphasis on economic growth in these countries, together with an increasing emphasis on the protection of the environment and the quality of life. Other research on post-materialism shows that in countries with a prevailing post-materialist climate, the emphasis on income attainment is smaller than in materialistic countries (de Graaf, 1988), supporting Inglehart's description of post-materialists as 'economic underachievers'. The assumption of stability of post-materialist value-orientations within a culture over relatively long periods of time is supported by extensive empirical research from De Graaf using panel-data for the period 1974-1985 (De Graaf, 1988; De Graaf and De Graaf, 1988), as well as others (Dalton 1984; De Graaf, Hageaars en Luijckx 1989; Niehof, 1992; Van Deth, 1984). More recent research does show that the trend toward post-materialism is slowing (De Graaf, 1996) or even declining (Van Deth, 1995). Nevertheless, the bulk of the research shows that these values are very slow to change within particular cultures.

3 The Model and Hypotheses

3.1 Post-materialism and level of entrepreneurship

The underlying premise of this research study is that the material gains that are central or crucial to entrepreneurial activity are of less value to post-materialist individuals. Research by McGrath, MacMillan and Scheinberg (1992) shows that individual entrepreneurs from a wide variety of countries are more likely to have materialistic values, such as viewing success as making lots of money, than do their non-entrepreneur counterparts. However, they do not test for country differences. Blais and Toulouse (1998) do make such comparisons and conclude that entrepreneurs across countries tend to have similar motivations. In another study of individual entrepreneurs, Robichaud, McGraw and Roger (2001) find a positive correlation between extrinsic motivation of the entrepreneur and sales performance whereas they find negative relationships between the independent variables, intrinsic motivation and autonomy and independence on the one hand and the dependent variable, sales performance, on the other. These findings are interesting because at the micro-level they correspond to the thesis that entrepreneurs, especially successful ones, are more materialistic than their counterparts. Lacking comparable research at the macro-level of analysis, we can only draw on these studies for our hypotheses. In particular, assuming that trends from the micro level can be aggregated to the societal level, we predict that the relationship between post-materialism and entrepreneurship is also negative, i.e., the more less materialistic the culture, the fewer people choose to become self-employed. The central hypothesis of the present paper then reads: *The more post-materialistic the culture, the lower the overall level of entrepreneurship.*

3.2 Economic factors as control variables and level of entrepreneurship

Past research shows that certain factors, such as low levels of prosperity (as measured by gross domestic product) and unemployment are push factors toward self-employment. Low wages in the regular work force often provide an incentive to establish one's own business as a way to increase material wealth (Wennekers, Noorderhaven, Thurik and Hofstede, 2002).

Other research shows a fairly strong positive relationship between levels of education and post-materialism (De Graaf and Evans, 1996; Inglehart, 1992). That is, rising levels of education lead to rising levels of post-materialist values. Further, in an extensive study on the American occupational structure Blau and Duncan (1967) conclude that educational attainment is a more important predictor of someone's occupation than background characteristics such as the father's occupation or education. They also conclude that the intergenerational mobility within business families increases and increasingly, as a result, children of business owners choose to pursue a different career than their parents.

The growing importance of knowledge and rising educational levels also require organizations to organize (the way of) production in conformity with the supply of individualistic human capital (Audretsch and Thurik, 2000). Individuals now have the chance to achieve social status within average organisations and entrepreneurship is no longer 'the only way out' of lower socio-economic positions. Other research also supports the

notion that education may be indirectly linked to lower self-employment rates due to its inverse relationship to unemployment (Audretsch, Thurik, Verheul and Wennekers, 2002). Thus, more highly educated people are less likely to become unemployed, which, as stated earlier, is a push factor towards self-employment.

Several other economic factors can be considered with respect to self-employment such as female labor force participation and service sector as a share of the overall labor force. With respect to female labor force participation, it might be argued that since women tend to have lower self-employment rates than men, as their share rises, the overall rate of self employment is lower (Audretsch, Thurik, Verheul and Wennekers, 2002). In addition, Evans and Leighton (1989) point out that starting entrepreneurs often have a long history of employment. Women tend to have shorter employment histories than men, because of breaks for getting and raising children. Finally, it might be argued that rising levels of education in a country include a higher ratio of females in the labor force.

In sum, to better understand the separate impact of postmaterialism on self-employment is it important to control for these other factors. High covariation does not negate the importance of post-materialism, but a joint regression analysis allows a test of whether post-materialism may contribute independently to an explanation of variation of self-employment.

3.3 Other cultural factors as control variables and level of entrepreneurship

Other aspects of culture may also influence self-employment. A major factor pushing people toward self-employment is job dissatisfaction. Brockhaus (1982) finds self-employed to be relatively strongly dissatisfied with their (previous) work itself, with supervision and with opportunities for promotion (but more satisfied with actual pay). More generally, the state of being out of place or between things (Shapero and Sokol, 1982, p. 81) often precedes the formation of a company. Dissatisfaction as a motive at the micro level has often been confirmed in survey studies with respect to both job mobility and business start-ups (Noorderhaven, Wennekers and Thurik, 2002; Wennekers, Noorderhaven, Thurik and Hofstede, 2002). So at the level of the individual, a strong dissatisfaction with life in general is probably associated with a stronger propensity to become self-employed. What exists at the micro level appears also to exist at the macro level. In a study by Wennekers, Noorderhaven, Thurik and Hofstede (2002), life dissatisfaction is found to be positively correlated with self-employment.

The cultural variable post-materialism indicates the culture in which individualism, self-esteem and feelings of security are stronger. Past research focuses on distinctions between the Protestant Ethic and Catholicism, showing positive influence of the former on economic development in support of Weber's thesis (Blum and Dudley, 2001; Landes, 1998; Weber, 1930). Inglehart (1997) found that post-materialism is negatively related to church attendance. Thus we might presume that in post-materialist countries, the proportion of weekly church-goers is lower. Because we have not focused on religious sect per se, we have no a priori idea about the influence of church-goers on self-employment, but we will introduce the variable as a control.

Finally, another cultural aspect that can add information about the cultural environment is political orientation. In his research, Inglehart (1977, 1990, 1997) suggests that along with rising post-materialism, societies also change in their political orientations. More

specifically, Inglehart suggests that with a relative decline of social class conflict, left-wing extremism diminishes. With a declining legitimacy of the nation-state, right wing extremism is also seen to diminish. Thus, post-materialism is seen to have a moderating effect on politics and political orientation. To the extent post-materialism is predicted to have a negative effect on self-employment, indirectly, it is also assumed that left-right political extremism is positively related to self-employment. Once again, although these other cultural factors are not in themselves the primary focal point of our research, controlling for their effects may provide insights into our understanding of the relationship between post-materialism and self-employment.

4 Research method

4.1 Data and variables

In order to test our central hypothesis about the influence of post-materialism on entrepreneurship, data is used from different sources including the OECD and World Value Surveys (ICPSR, 1994). Because of the known interactions between economic and cultural factors found in previous research, a set of economic and other cultural factors is also included to provide a clearer picture of the independent role post-materialism plays in prediction of self-employment levels. Details on the different variables used in the research are presented in Appendix 1. The measure for post-materialism is based upon Inglehart's four-item post-materialism index. Economic variables, also obtained from secondary sources, include the percent of unemployed, average years of education among adults, the percentage of women participating in the labor force, share of adult employment in the service sector, and gross domestic product per capita. Other cultural factors include church attendance, political (left or right) extremism and average life satisfaction.

4.2 The sample

Data from up to 24 OECD countries is available. However, for the regression analyses, overlapping data on economic and cultural factors is available from only fourteen of these countries including Belgium, Canada, Denmark, Finland, France, Germany (Western), Iceland, Ireland, Italy, Japan, Spain, Sweden, The Netherlands and the United Kingdom. These were the countries for which complete data was available.

4.3 Data Analysis

The data analysis has two parts. Part I involves the analysis of data for the level of self-employment across 14 OECD countries and 12 observations over a 20-year period (1974-1994). There are 168 observations. In part II of the study, data are averaged from two years, 1982 and 1990, for which all independent variables are available. There are 14 observations. Averaged data are used to improve reliability at the country level. Initially, bivariate correlations were run to examine the effects of individual variables on the dependent variable of self-employment. In an effort to disentangle the influence of economic factors, post-materialism and other cultural factors, a further set of regression analyses were carried out. Because of the small sample size, a preliminary regression analysis was carried out to identify the primary economic factor explaining variation in self-employment. Subsequent regression analyses were then done using only this factor, with post-materialism and the other cultural factors.

5 Results

5.1 Validation of the aggregation of data across time

In Part I, an analysis of variance shows that the majority of variation can be explained by country variation ($\eta^2=.88$) rather than time period ($\eta^2=.024$). This confirms previous research findings that country provides an important source of explanation for variation in entrepreneurial activity. Its relative stability suggests that certain institutional and/or cultural factors may play a role in this stability.

5.2 Prediction of self employment

In Part II, in an initial test, using the Pearson Product-Moment Correlation coefficient, post-materialism is negatively related to self-employment, consistent with predictions ($r=-.682$, $p<.01$, $n=15$). Results of other bivariate tests for independent, control, and dependent variables are presented in Appendix 2. Further regression analyses are carried out to control for various economic and cultural effects, in order to gain better insight into this relationship. Due to the small sample size, a regression analysis of the seven economic variables against self-employment was used to determine whether a smaller subset of economic variables could be used as a control. When including education, unemployment, female labor force participation, labor income share, the service sector share, and finally, the GDP per capita, education has the most pronounced effects on self-employment. The bivariate correlation between education and self-employment is highest among the economic factors ($r=-.734$, $p<.01$). Further, when entered first in a stepwise forward regression analysis, the added contribution of the other economic variables is not significant.

For further testing we use education, post-materialism and the three culture variables (life satisfaction, church attendance and left-right extremism) for determining whether post-materialism has an independent influence on self-employment. Using education as one of the controls for testing the influence of post-materialism on entrepreneurship has the advantage of a strong test since education is often found to explain post-materialism (De Graaf and Evans, 1996; Inglehart, 1992).

Table 1 presents a summary of the regression analyses carried out on self-employment for the 14 OECD countries for which comparable data is available. In independent regressions education, post-materialism and the culture variables are important predictors of self-employment (the adjusted R^2 ranges from .424 in the case of post-materialism to .687 for the culture variables). The question now is what happens if post-materialism has to 'compete' with the other variables. In a regression together with education the effect of post-materialism remains negative and significant at a 5% level. In a regression with the culture variables it also remains negative albeit at a 10% level of significance. Post-materialism clearly contributes in both a regression with education and one where the culture variables are taken into account. When all three groups of variables (education, post-materialism and culture) are combined, the independent, the statistical significance of the effects disappears, but all signs remain similar to those established in the independent regressions. The series of regressions does suggest indeed that post-materialism may provide an important contribution toward the explanation of variation in self-employment.

table 1 Regressions on Self-Employment across 14 OECD Countries

<i>Variable</i>	<i>Education</i>	<i>Post-materialism</i>	<i>Other culture variables</i>	<i>Education and post-materialism</i>	<i>Post-materialism and culture</i>	<i>All variables</i>
Education	.189**			-.016**		-.007
Post-materialism		-.146**		-.093*	-.068#	-.080
Life satisfaction			-.031**		-.022*	-.013
Church attendance)			.001*		.000*	.000
Left-right extremism			.004**		.004**	.003
R ²	.539	.465	.754	.784	.821	.850
Adj. R ²	.504	.424	.687	.745	.749	.756
F-Statistic	15.20**	11.31**	11.25***	19.95***	11.44***	9.06 **
Number of obs.	14	14	14	14	14	14

$p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

In summary, findings confirm the significance of economic factors in predicting self-employment levels with economies with a higher level of economic development having lower levels of self-employment. Education, in particular, absorbs the variation explained in self-employment and is used in subsequent analyses due to the small sample size. Controlling for economic factors, (i.e. education) there is still a clear residual effect of post-materialism that remains significant. In particular, societies with a higher level of post-materialism tend to have lower entrepreneurial activity. However, this effect does not appear to be independent of education representing economic influences and the other cultural factors measured in the study, suggesting a relevant co-variation among these latter factors (post-materialism with education, life satisfaction, religiousness and political extremism,). It is interesting to note that life satisfaction has a negative influence on self-employment and both church attendance and left-right extremism a positive influence.

6 Discussion

This study is limited by its small sample size (fourteen countries) and by its particular period of time (the average of 1982 and 1990). The conclusions from these analyses can be drawn only on a tentative basis. However, the strength and size of the findings, with respect to their significance levels and amount of variation explained, certainly point toward the benefits of pursuing the impact of post-materialism on level of entrepreneurship. One aspect that needs to be further taken into account is the relative stability of post-materialism. Although earlier research (De Graaf, 1984) pointed to the stability of this cultural characteristic, more recent research suggests that it may be declining. On the other hand, if this characteristic is declining only slowly, and in line with major historical changes (i.e. the strong recession of the 1980s), perhaps it is nevertheless an important cultural variable.

It is interesting that, whereas post-materialism does serve to predict self-employment, in past research a different operationalization of the similar concept, Hofstede's masculinity index, which essentially also measures the degree of materialism in a society, though weakly positive, is not significantly correlated with self-employment (Wennekers, Noorderhaven, Thurik and Hofstede, 2002). Thus, further research needs to rule out method bias and examine whether indeed the underlying construct of post-materialism is being appropriately measured. However, given the extensive research already undertaken using this measure over the past thirty years, Inglehart's measure appears to be well validated.

Furthermore, this research examines relationships on a simple linear basis. However, recent research suggests a U-shaped curve of self-employment, first declining and later rising again over time (Carree, van Stel, Thurik and Wennekers, 2002; Audretsch, Thurik, Verheul and Wennekers, 2002). The reversal of the trend toward lower levels of self-employment is described as the transition from the managed to the entrepreneurial economy (Audretsch and Thurik, 2000, 2001). However, during the twenty-year period under study (1974-1994), an analysis of variance carried out initially in our study supports the notion that relative differences across countries explain more variation in self-employment than does the particular point in time. Nevertheless, research taking other data points would be helpful in testing this hypothesis. Unfortunately, to date, currently available research data on post-materialism across a broad number of countries is limited to only certain data points (i.e., 1982 and 1990) representing the period of declining levels of entrepreneurship.

Finally, perhaps most importantly, there is some question as to the legitimacy of using self-employment as a surrogate for level of entrepreneurship activity. There are those that would argue that measuring entrepreneurship by including the number of single establishments and/or small 'mom and pop' shops may be misleading and that entrepreneurship should reflect growth potential of firms (Wennekers and Thurik, 1999). Further work might explore the use of other indicators for level of entrepreneurship as the dependent variable to confirm the results found in our study.

7 Conclusion

Audretsch, Carree, van Stel and Thurik (2002) propose that a process of industrial restructuring has been transforming the developed economies, where large corporations are accounting for less economic activity and small firms are accounting for a greater share of economic activity. Not all countries, however, are experiencing the same shift in their industrial structures. Little is known about the cost of resisting this restructuring process. They identify whether there is a cost, measured in terms of forgone growth, of an impeded restructuring process. The cost is measured by linking growth rates of European countries to deviations from the 'optimal' industrial structure. Their empirical evidence suggests that countries impeding the restructuring process pay a penalty in terms of forgone growth. The importance of small firms, entrepreneurship or rate of self-employed for economic growth has been amply documented in recent years (Carree and Thurik, 2002). This has raised the question as to where entrepreneurship comes from. The study of the determinants of entrepreneurship has been dominated by the role of economic factors.

Two caveats are appropriate here. First, the relationship between post-materialism and self-employment holds across nations, and may not be true for individuals within countries. It might be that post-materialism also plays a role within countries but this cannot be concluded from this cross-national study. Secondly, one must be prudent in extrapolating the conclusions found in this study to worldwide relationships. This study is based on Western countries (with the exception of Japan). Further research is needed to test our conclusions for different country samples. In particular, this study is based primarily on more affluent cultures based on Western traditions. But this limitation does not disqualify important findings from this study, which shows that even within Western countries, national culture may have powerful effects on the level of entrepreneurship.

In summary, the primary purpose of the present study is to test the relationship between post-materialism and levels of nation-wide entrepreneurship. The findings clearly confirm a negative relationship between post-materialism and self-employment: countries marked by less materialistic values tend to have lower self-employment as a proportion of the overall labor force. Further, although education is also strongly and negatively associated with self-employment, post-materialism explains additional variation in the dependent variable. Various other culture variables, including, life satisfaction, church attendance and left right extremism also explain some variation in self-employment. In particular, greater dissatisfaction, church attendance and extremism all predict higher levels of self-employment. There is fairly high multicollinearity among the variables of the present study. However, they still appear to contribute a certain amount of unique explanation suggesting that post-materialism does matter as an independent predictor of self-employment. Further research should be done to confirm the stability of this relationship in ensuing decades, and also to test for this relationship against measures of level of entrepreneurship other than self-employment.

References

- Acs, Z.J., 1992, 'Small Business Economics; a Global Perspective', *Challenge* **35**, 38-44.
- Acs, Z.J., D.B. Audretsch and D.S. Evans, 1994, The Determinants of Variations in Self-employment Rates across Countries over Time, unpublished manuscript.
- Audretsch, D.B. and A.R. Thurik, 2000, 'Capitalism and Democracy in the 21st Century: from the Managed to the Entrepreneurial Economy', *Journal of Evolutionary Economics* **10**, 17-34.
- Audretsch, D.B. and A.R. Thurik, 2001, 'Sources of Growth: the Entrepreneurial versus the Managed Economy', *Industrial and Corporate Change* **10**, 267-315.
- Audretsch, D.B., M.A. Carree, A. van Stel and A.R. Thurik, 2002, 'Impeded Industrial Restructuring: the Growth Penalty', *Kyklos* **55**, 81-97.
- Audretsch, D.B., M.A. Carree and A.R. Thurik, 2001, 'Does Entrepreneurship Reduce Unemployment?', Tinbergen Institute Discussion Paper TI01-074/3, Erasmus University Rotterdam.
- Audretsch, D.B., A.R. Thurik, I. Verheul and A.R.M. Wennekers, 2002, *Entrepreneurship: Determinants and Policy in a European-US Comparison*, Boston/Dordrecht: Kluwer Academic Publishers.
- Barnouw, V., 1979, *Culture and Personality*, Homewood, IL: The Dorsey Press.
- Blais, R. A. and J. Toulouse, 1998, 'National, Regional or World Patterns of Entrepreneurial Motivation': an Empirical Study of 2,278 Entrepreneurs and 1,733 Non-Entrepreneurs in Fourteen Countries on Four Continents', *Journal of Small Business and Entrepreneurship* **7**, 3-20.
- Blanchflower, D. G., 2000, 'Self-employment in OECD Countries', *Labour Economics* **7**, 471-505.
- Blanchflower, D. G. and Oswald, A. J., 1994, *The Wage Curve*, Cambridge, MA: MIT Press.
- Blau, D., 1987, 'A Time Series Analysis of Self-Employment', *Journal of Political Economy* **95**, 445-467.
- Blau, P. M. and O. D. Duncan, 1967, *The American Occupational Structure*, New York, NY: John Wiley.
- Blum, U. and L. Dudley, 2001, 'Religion and Economic Growth: Was Weber Right?', *Journal of Evolutionary Economics* **11**, 207-230.
- Brock, W.A. and D.S. Evans, 1986, *The Economics of Small Businesses: Their Role and Regulation in the U.S. Economy*, New York: Holmes and Meier.
- Brockhaus, R. H., 1982, 'the Psychology of the Entrepreneur', in C. A. Kent, D. L., Sexton and K. H. Vesper (eds.) *Encyclopedia of Entrepreneurship*, Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Busenitz, L. W., C. Gómez, and J. W. Spencer, 2000, 'Country Institutional Profiles: Unlocking Entrepreneurial Phenomena', *Academy of Management Journal* **43**, 994-1003.
- Carree, M., A. van Stel, A. R. Thurik and A. R.M. Wennekers, 2002, 'Economic Development and Business Ownership: An Analysis Using Data of 23 OECD Countries in the Period 1976-1996', *Small Business Economics* **18**, forthcoming.

- Carree, M.A. and A.R. Thurik, 2002, 'The Impact of Entrepreneurship on Economic Growth', in *Handbook of Entrepreneurship*, D.B. Audretsch and Z.J. Acs (eds), Boston/Dordrecht: Kluwer Academic Publishers, forthcoming.
- Davidsson, P. (1995), 'Culture, Structure and Regional Levels of Entrepreneurship', *Entrepreneurship and Regional Development* **7**, 41-62
- Dalton, R.J. (1984), 'The Persistence of Values and Life Cycle Changes', *Politische Vierteljahresschrift* **12**, 189-207.
- Deth, J.W. van, 1984, *Politieke Waarden: Een Onderzoek naar Politieke Waarde-orientaties in Nederland in de Periode 1970 tot en met 1982*, Dissertation, Amsterdam.
- Deth, J.W. van, 1995, 'De stabiliteit van Oude en Nieuwe Politieke Orientaties', in J. J. M. van Holsteyn and B. Niemoller (eds.), *De Nederlandse Kiezer*, Leiden: DWSO Press.
- Etzioni, A., 1987, 'Entrepreneurship, Adaptation and Legitimation', *Journal of Economic Behavior and Organization* **8**, 175-189.
- European Commission, 1999, *Action Plan to Promote Entrepreneurship and Competitiveness*, Directorate-General for Enterprise.
- Evans, D.S. and L.S. Leighton (1989), 'The Determinants of Changes in U.S. Self-Employment, 1968-1987.' *Small Business Economics* **2**, 319-330.
- Graaf, N. D. de, 1988, *Postmaterialism and the Stratification Process: An International Comparison*, Utrecht: ISOR.
- Graaf, N. D. de, 1996, 'Politieke Scheidslijnen: Ontwikkelingen in de Politieke Participatie en Politieke Voorkeuren', in H. B. G. Ganzeboom and W. C. Ultee (eds.), *De Sociale Segmentatie van Nederland in 2015*, WRR Rapport V96, Den Haag: SDU.
- Graaf, N. D. de and P. M. de Graaf, 1988, 'De Samenhang tussen Leeftijd en Postmaterialistische Waarden', *Sociologische Gids* **6**, 397-417.
- Graaf, N.D. de, J. Hagenars, and R. Luijkx (1989), 'Intragenerational Stability of Post-materialism in the United States, West Germany and the Netherlands', *European Sociological Review* **5**, 183-201.
- Hofstede, G., 1980, *Culture's Consequences: International Differences in Work-Related Values*, *Cross Cultural Research and Methodology Series Vol. 5*, Newbury Park, CA: Sage Publications.
- Huisman, D., 1985, 'Entrepreneurship: Economic and Cultural Influences on the Entrepreneurial Climate', *European Research* **13** (4), 10-17.
- Huisman, D. and W. J. de Ridder, 1984, *Vernieuwend Ondernemen*, Utrecht: SMO.
- Inter-University Consortium for Political and Social Research, 1994, *World Values Survey 1981-1984 and 1990-1993 (codebook)*, Ann Arbor, MI: ICPSR.
- Inglehart, R., 1977, *The Silent Revolution: Changing Values and Political Styles among Western Publics*, Princeton, NJ: Princeton University Press.
- Inglehart, R., 1990, *Culture Shift in Advanced Industrial Society*, Princeton, NJ: Princeton University Press
- Inglehart, R., 1997, *Modernization and Post-modernization: Cultural, Economic and Political Change in 43 Societies*, Princeton, NJ: Princeton University Press.
- Kroeber, A. L. and T. Parsons, 1959, 'The Concepts of Culture and of Social System', *American Sociological Review* **23**, 582-583.
- Kuznets, S., 1971, *Economic Growth of Nations, Total Output and Production Structure*, Cambridge, MA: Harvard University Press/Belknap Press.

- Landes, D. S., 1998, *The Wealth and Poverty of Nations: Why Some are so Rich and Some so Poor*, New York, NY: Norton.
- Lee, S. M. and S. J. Peterson, 2000, 'Culture, Entrepreneurial Orientation, and Global Competitiveness', *Journal of World Business* **35** (4), 401-416.
- Lever, M. and H. Nieuwenhuijsen, 1999, 'The Impact of Competition on Productivity in Dutch Manufacturing', in D.B. Audretsch and A.R. Thurik (eds), *Innovation, Industry Evolution and Employment*, Cambridge, UK: Cambridge University Press, 111-128.
- Maslow, A., 1954, *Motivation and Personality*, New York: Harper and Row.
- McGrath, R. G. and I. C. MacMillan, 1992, 'More Like Each Other Than Anyone Else? Cross-Cultural Study of Entrepreneurial Perceptions', *Journal of Business Venturing* **7** (5), 419-429.
- McGrath, R.G., I.C. MacMillan and S. Scheinberg (1992), 'Elitists, Risk-takers, and Rugged Individualists? An Exploratory Analysis of Cultural Differences between Entrepreneurs and Non-entrepreneurs', *Journal of Business Venturing* **7** (2) 115-136.
- Meager, N., 1992, 'Does Unemployment Lead to Self-employment?', *Small Business Economics* **4**, 87-103.
- Mueller, S. L. and A. S. Thomas, 2000, 'Culture and Entrepreneurial Potential: A Nine Country Study of Locus of Control and Innovativeness', *Journal of Business Venturing* **16**, 51-75.
- Niehof, T. J., 1992, Postmaterialisme en Levensloopeffecten: een Onderzoek naar de Invloed van een Verandering in Leefsituatie op Postmaterialistische Waardenorientaties. Doctoraal thesis, Katholieke Universiteit Nijmegen.
- Noorderhaven, N. G., A.R.M. Wennekers, and A. R. Thurik, 2002, *Self-employment Out of Dissatisfaction: An International Study*, ERIM (Erasmus Research Institute for Management) Report, ERS 2001-XX-STR, Rotterdam, NL: Erasmus University Rotterdam, forthcoming.
- OECD, 1998, *Fostering Entrepreneurship, the OECD Jobs Strategy*, OECD: Paris.
- Reynolds, P.D., M. Hay, W.D. Bygrave, S.M. Camp and E. Autio, 2000, *Global Entrepreneurship Monitor: 2000 Executive Report*, Kauffman Center for Entrepreneurial Leadership.
- Robichaud, Y., E. McGraw, and A. Roger, 2001, 'Toward the Development of a Measuring Instrument for Entrepreneurial Motivation', *Journal of Developmental Entrepreneurship* **6**, 189-201.
- Shapiro, A. and L. Sokol, 1982, 'The Social Dimensions of Entrepreneurship', in C. A. Kent, D. L., Sexton and K. H. Vesper (eds.), *Encyclopedia of Entrepreneurship*, Englewood Cliffs, NJ: Prentice-Hall, Inc., 72-90.
- Stanworth, M J. K. and J. Curran, 1973, *Management Motivation in the Smaller Business*, London: Gower Press.
- Teece, D.J., 1993, 'The Dynamics of Industrial Capitalism: Perspectives on Alfred Chandler's Scale and Scope', *Journal of Economic Literature* **31**, 199-225.
- Thurik, A.R., 1996, Small Firms, Entrepreneurship and Economic Growth, in P.H. Admiraal (ed.), *Small Business in the Modern Economy*, Oxford: Basil Blackwell Publishers, 126-152.
- Tiessen, J. H. 1997, 'Individualism, Collectivism, and Entrepreneurship: A Framework for International Comparative Research', *Journal of Business Venturing* **12**, 367-384.
- Uxem, F.W. van and J. Bais, 1996, *Het Starten van een Bedrijf: Ervaringen van 2000 Starters*, Zoetermeer: EIM.

- Weber, M., 1930, *The Protestant Ethic and the Spirit of Capitalism*, New York, NY: Scribner's.
- Wennekers, S., N. Noorderhaven, G. Hofstede, and A. R. Thurik, 2002, 'Cultural and Economic Determinants of Business Ownership Across Countries', *Frontiers of Entrepreneurship Research 2001*, Babson College, MA: Center for Entrepreneurial Studies, forthcoming.
- Wennekers, S. and A.R. Thurik, 1999, 'Linking Entrepreneurship and Economic Growth', *Small Business Economics* **13**, 27-55
- Wennekers, S., A. R. Thurik and L. M. Uhlaner, 2002, 'A Synthesis of Perspectives on Entrepreneurship and Economic Performance', *International Journal of Enterprise Education* **1**, forthcoming.
- Verheul, I., S. Wennekers, D. Audretsch and A. R. Thurik, 2002, 'An Eclectic Theory of Entrepreneurship: Policies, Institutions and Culture', in D.B. Audretsch, A.R. Thurik, I. Verheul and A.R.M. Wennekers (eds), *Entrepreneurship: Determinants and Policy in a European-US Comparison*, Boston/Dordrecht: Kluwer Academic Publishers.

Appendix 1 Source and Measurement of Variables

Economic variables

Self-employed (%) (mean of two time periods: 1982 and 1990)

Self-employed is measured as the percentage of the total labor force (i.e. the number of people actively participating in paid labor and/or actively in search of paid labor). A broad definition of self-employed was used, including those owning a business that is not legally incorporated or owning an incorporated business from which they gain profits as well as salary. Where country data used the narrow definition (single employee firms only) a correction factor was used. For a detailed description of the correction factors used, see Carree, van Stel, Thurik and Wennekers (2002) or contact André van Stel at EIM (ast@eim.nl)

Unemployment rate (standardized)

The standardized unemployment rate represents the number of unemployed as a percentage of the total labor force (self-employed, unpaid workers, army personnel and un-employed). Sources include the OECD Main Economic Indicators, OECD, Labor Force Statistics 1974-1994, and for Australia, Denmark, Greece, Luxembourg, Iceland and Switzerland, the International Labor Office, Yearbook of Labor Statistics, 1982, 1986, and 1994.

Labor income share

The Labor income quota represents the compensation of workers and self-employed proportional to total employment. To correct for the imputed wage income of self-employed, the total compensation of employees is multiplied by (total employment/number of employees). The corrected compensation figure is then divided by total income (compensation of employees plus other income). The data on the separate variables are from the OECD National Accounts 1960-1994, Detailed Tables. Some missing data have been filled up with help of data from the OECD Labor Force Statistics.

Female labor participation

Female labor participation is the percentage of women in the labor force. The source is OECD, Historical statistics, 1960-1993 (1995), Labor Force Statistics, 1974-1994.

Education

The Education variable is the average amount of years spent on education, for the total population above age 18. This data comes from the World Value Survey, 1980-82, and 1990-92.

Share service sector

The Share service sector represents the proportion of the of the economy with activities in the service sector (on the basis of international registration)

Gross Domestic Product per capita

The GDP in constant prices comes from the National Accounts detailed tables. These figures have been fixed to the price level of 1990 in local currencies and via the purchasing power parity of 1990 to the same currency. Constant prices are used because trends in welfare needed to be estimated. The year 1990 is chosen because it seems to be a reasonably stable year concerning level of prices. The purchasing power parity is a better measure for comparing welfare between countries than the exchange rate which can strongly fluctuate per year because of speculations The size of the population comes from the Labor Force Statistics. The source is OECD, National accounts, detailed tables 1960-1994; Labor Force Statistics 1974-1994.

Postmaterialism

The source of the postmaterialism data is the World Values Survey, 1981-1984 and 1990-1993 (ICPSR, 1994). The mean score on Inglehart's 4-item post-materialism index (range between 0 and 3). Respondents were asked to select the most important and second important goal a country should have from the following four items: a) Maintaining order in the nation, b) Giving people more to say in important government decisions, c) Fighting rising prices and d) Protecting freedom of speech. The post-materialism index is constructed as follows:

- Materialist: first choice item a, second choice item c or first choice item c and second choice item a.
- Mixed: first choice item a or c and second choice item b or d or first choice item b or d and second choice item a or c.
- Post-materialist: first choice item b and second choice item d or first choice item d and second choice item b.

Other cultural variables

The other three cultural variables used in this paper are also derived from the World Values Survey, 1981-1984 and 1990-1993 (ICPSR, 1994).

Satisfaction

The score for this variable is constructed as the average score of the inhabitants of a country rating the following three areas on a scale ranging from 1 (completely dissatisfied) to 10 (completely satisfied).

Life as a whole (Life satisfaction)

Work (Job satisfaction)

The Home situation (Personal satisfaction)

Church attendance

Church attendance is based on the percentage of people attending church on a weekly basis.

Left-right extremism

This item measures the percentage of people that place themselves on the extreme ends of the 10-point political left-right scale (i.e. placement on 1, 2, 9 or 10).

Appendix 2 Correlations

table 2 Pearson Product-Moment Correlations among the independent, dependent and control variables¹

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Self-employment	1.00												
2. Education	-.734**	1.00											
3. Unemployment	.321	-.384	1.00										
4. Female labor participation	-.454*	.698**	-.308	1.00									
5. Labor income share	.242	.260	-.204	-.101	1.00								
6. Share service sector	-.499*	.620*	.088	.391	-.205	1.00							
7. Gross domestic product	-.651**	.512	-.402	.335	-.164	.664**	1.00						
8. Post-materialism	-.682**	.604*	-.024	.502	.150	.424	.268	1.00					
9. Church attendance	.441	-.386	.529*	-.686**	-.175	-.308	-.423	-.268	1.00				
10. Left-right extremism	.512*	-.422	-.199	-.072	.132	-.509*	-.209	-.271	.261	1.00			
11. Life satisfaction	-.555*	.489	-.200	.396	.105	.416	.143	.497*	-.026	.081	1.00		
12. Work satisfaction	-.093	.121	-.066	.090	-.204	.361	.114	.264	.086	.218	.698**	1.00	
13. Personal satisfaction	-.444	.428	.037	.354	.163	.544*	.108	.508*	.046	-.035	.925**	.633**	1.00

* Correlation is significant at the .05 level (two-tailed).

** Correlation is significant at the .01 level (two-tailed).

¹ Correlations are based on pair-wise deletion of missing data for 24 OECD countries with actual N ranging between 15 and 23 depending upon the relationship tested.

The results of EIM's Research Programme on SMEs and Entrepreneurship are published in the following series: Research Reports, Strategic Studies and Publicatie-rapportages. The most recent publications of all three series may be downloaded at: www.eim.nl/smes-and-entrepreneurship.

Recent Research Reports

H200201	8-27-2002	Gibrat's Law: Are the Services Different?
H200111	3-21-2002	Growth patterns of medium-sized, fast-growing firms
H200110	3-21-2002	MISTRAL
H200108	3-4-2002	Startup activity and employment growth in regions
H200107	2-5-2002	Het model Brunet
H200106	1-18-2002	Precautionary actions within small and medium-sized enterprises
H200105	10-15-2001	Knowledge spillovers and employment growth in Great Britain
H200104	10-4-2001	PRISMA 2001, The Kernel
H200103	8-13-2001	The Emergence of ethnic entrepreneurship: a conceptual framework
H200102	6-12-2001	Competition and economic performance
H200101	6-12-2001	Measuring economic effects of stimulating business R&D
H200013	4-25-2001	Setting up a business in the Netherlands
H200012	4-4-2001	An eclectic theory of entrepreneurship: policies, institutions and culture
H200011	3-27-2001	The Effects of transaction costs and human capital on firm size: a simulation model approach
H200010	2-28-2001	Determinants of innovative ability
H200009	2-22-2001	Making sense of the New Economy
H200008	2-12-2001	KTO2000 - een sectormodel naar grootteklasse voor de analyse en prognose van Korte Termijn Ontwikkelingen
H200007	12-11-2000	Kennis-spillovers en economische groei
H200006	12-7-2000	Estimating missing data within an accounting and aggregation framework
H200005	10-10-2000	The Impact of contestability on prices in manufacturing industries
H200004	7-13-2000	The ARKO labour-cost model
H200003	6-22-2000	Comparative advantages in estimating markups
H200002	6-20-2000	Determinants of Successful Entrepreneurship
H200001	6-22-2000	Strategies, uncertainty and performance of small business startups
H199913	5-15-2000	Determinants of firm-size
H199912	5-8-2000	Measuring innovative intensity
H199911	5-8-2000	Modelling Business Ownership in the Netherlands
H199910	4-6-2000	Start-up capital: Differences between male and female entrepreneurs
H199909	3-27-2000	Turbulence and productivity in the Netherlands
H199908	2-18-2000	Modelling returns to R&D: an application on size effects