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The Relationship between Entrepreneurship and Economic Development: Is It U-Shaped?

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Abstract

Following a centuries-long decline in the rate of self-employment, a discontinuity in this downward trend is observed for many advanced economies starting in the 1970s and 1980s. In some countries, the rate of self-employment appears to increase. At the same time, cross-sectional analysis shows a U-shaped relationship between start-up rates of enterprise and levels of economic development. We provide an overview of the empirical evidence concerning the relationship between independent entrepreneurship, also known as self-employment or business ownership, and economic development. We argue that the reemergence of independent entrepreneurship is based on at least two 'revolutions'. If we distinguish between solo self-employed at the lower

end of the entrepreneurship spectrum, and ambitious and/or innovative entrepreneurs at the upper end, many advanced economies show a revival at both extremes. Policymakers in advanced economies should be aware of both revolutions and tailor their policies accordingly.

Keywords: Entrepreneurship, self-employment, business ownership, business start-ups, economic development, U-shape, L-shape.

JEL Codes: L26, J24, M13, O14, O31.

Summary

Following a centuries-long decline in the rate of self-employment, a discontinuity occurred in this downward trend for many advanced economies starting in the 1970s and 1980s. In some countries the rate of self-employment appears to increase. Weighing the evidence, it is too early to conclude that the historical, decreasing relationship between economic development and the *level* of business ownership has become U-shaped. Nonetheless, a trend break is beyond doubt, and this discontinuity is all the more remarkable as there is no obvious reason why independent entrepreneurship should not continue decreasing. Yet we know that powerful new driving forces are at the fore since the mid-1970s. These include the rapidly growing services sector with its smaller scale and lower entry barriers, an increasing differentiation of consumer preferences, declining transactions costs, and a trend in occupational preferences toward more autonomy and self-realization. Additionally, globalization in concert with the spread of ICT (information and communication technologies) enables solo entrepreneurs and small firms to reap the fruits of scale economies through loosely organized networks. And last but not least new technologies create opportunities for new technology-based business start-ups.

Early-stage entrepreneurial activity may be an even more important measure of entrepreneurship. Although there are no long time series for any measure of gross entry, cross-sectional analysis for recent years shows a significant U-shaped relationship between early-stage entrepreneurial activity and levels of economic development. Two 'revolutions' seem to drive the upward trend of this U-shaped curve. If we distinguish between solo self-employed at the lower end of the entrepreneurship spectrum, and ambitious and/or innovative entrepreneurs at the upper end, advanced economies show a revival at both ends. In sheer numbers the rise of self-employment without employees appears dominant. This trend has strong implications for the labor market and for the external organization of the business sector. However, at the upper end of the entrepreneurship spectrum an apparent positive correlation between the prevalence of ambitious, export-oriented and innovative business start-ups on the one hand and average per capita income on the other may be dominant in qualitative terms. This stylized fact represents the onset of an innovation-driven stage of economic development while marking a regime switch in the relationship between entrepreneurship and innovation. In addition, this correlation probably masks bidirectional causality.

Entrepreneurship has become a key policy issue. Insight in the relationship between entrepreneurship and economic development across countries is important for policymakers because it provides them with a beacon for their endeavors. Insight in the two revolutions driving the re-emergence of entrepreneurship is especially valuable. First, the rise of solo self-employment is important because it increases the flexibility and productivity of the economic system and contributes to a higher degree of job satisfaction, although it also increases insecurity for those involved as well as income inequality. Second, the upward trend of innovative and/or ambitious entrepreneurship is of particular importance for competitiveness, economic growth and job creation. Policymakers in advanced economies should be aware of both revolutions, recognize their determinants and implications, and tailor policies accordingly.

1

Introduction

After more than a century of declining business ownership rates in the labor force, a reversal of this trend is observed in many, though not all, highly developed economies, including the US and Germany. Since 1980, the revival of independent entrepreneurship not only refutes the long-standing Marxist prediction that the small business sector would evaporate, but it also suggests that the more recent Lucas hypothesis of a negative relationship between a country's level of per capita income and its rate of entrepreneurship no longer holds.[1] Using the literature on stages and patterns of economic development and structural change (Syrquin, 1988; Porter et al., 2002) as well as the literature on the determinants of entrepreneurship at the level of countries (Acs et al., 1994; Audretsch et al., 2002) as a foundation, an alternative, U-shaped relationship between economic development and the rate of entrepreneurship has been hypothesized (Acs et al., 1994; Wennekers and Thurik, 1999; Carree et al., 2002; Wennekers et al., 2005). This survey summarizes and updates the empirical evidence and presents the main lines of reasoning behind the relationship between economic

[1] See Lucas (1978) and Steinmetz and Wright (1989, pp. 981–982).

development and entrepreneurship. It is essential reading for policy makers because it provides them with a benchmark how to evaluate their country's specific entrepreneurship — economic development ratio as well as with an understanding what the developments are and how to influence them.

1.1 Definitions

Sternberg and Wennekers (2005) distinguish between the occupational and behavioral notions of entrepreneurship. The occupational notion centers on the individuals owning and managing businesses for their own account and risk, and is usually denoted as self-employment, independent entrepreneurship or business ownership. The behavioral notion centers on behavior related to pursuing an entrepreneurial opportunity, and it is generally denoted as entrepreneurial behavior or simply as entrepreneurship. It is clear that the occupational and behavioral notions are not mutually exclusive, but overlap to a substantial degree (Verheul et al., 2005).

This survey focuses on the occupational notion of entrepreneurship. Behavioral entrepreneurship will be taken into account in as far as it is incorporated in occupational entrepreneurship. A further distinction is that between a static perspective relating to the number of business owners and a dynamic perspective focusing on the creation of new businesses. Following the Global Entrepreneurship Monitor, we also refer to the dynamic perspective as 'early-stage entrepreneurial activity' (Reynolds et al., 2005; Bosma et al., 2008). This notion includes the activities of both nascent entrepreneurs and owner-managers of young businesses. Early-stage (independent) entrepreneurship usually involves at least some degree of entrepreneurial behavior as defined above,[2] while some scholars (Gartner and Carter, 2003) consider entrepreneurial behavior as identical to new firm organizing activity. Within the realm of independent entrepreneurship one can also distinguish between business owners with personnel (employers) and those without personnel (own account workers). The latter are also

[2] Exceptions are 'quasi entrepreneurship' and parts of 'necessity entrepreneurship', as will be discussed in Section 4.

known as 'solo self-employed' (Boegenhold and Fachinger, 2007). In the present survey, we will come across various other relevant subdivisions of entrepreneurship, including 'necessity' versus 'opportunity' entrepreneurship (Acs, 2006), 'real' versus 'quasi' entrepreneurship (Kautonen et al., 2009), and 'replicative' or 'routine' entrepreneurship versus 'innovative' or 'high impact' entrepreneurship[3] (Acs, 2008; Baumol, 2008; The Economist, 2009). Finally, for evidence of increasing heterogeneity of entrepreneurship across occupational categories, we refer to Arum and Müller (2004).

1.2 Structure of the Paper

Section 2 reviews the long historical decline in the rate of independent entrepreneurship. This includes the statistical evidence as well as a summary of the main driving forces behind this long term development. Section 3 investigates the evidence supporting the alleged revival of independent entrepreneurship. Against this background Section 4 interprets the various findings. First, it investigates to what extent the shift from the so-called 'managed' to the 'entrepreneurial' economy (Audretsch and Thurik, 2001) is a labor market phenomenon. Then, it considers to what extent these new push and pull factors in the labor market share the stage with a changing relationship between entrepreneurship and innovation. Section 5 presents conclusions and policy implications.

[3] A related notion is 'ambitious entrepreneurship' (Kirchhoff, 1994).

2

The Long Decline in the Rate of Independent Entrepreneurship

2.1 Empirical Evidence

2.1.1 Data for Six Countries

Historically, self-employment may well be the natural economic status of *Homo sapiens*.[1] However, driven by the division of labor, gradually paid jobs arrived on the scene. Although reliable statistics concerning the prevalence of self-employment in the distant past are not available, there are indirect indications (Braudel, 1982, pp. 52–54) that by the end of the eighteenth century the prevalence of self-employment had already declined to below 50% of the labor force in several of the most developed countries. To our knowledge the oldest economy-wide statistical material on self-employment pertains to the (early) nineteenth century.[2]

[1] It is a debatable and probably irresolvable issue to what extent tribal hunters and gatherers in prehistoric times compare best with self-employed and/or unpaid family workers, or whether many of them should be viewed as unfree laborers bonded to a chief. In ancient civilizations slavery was a major type of labor, just as serfdom of unfree peasants during the Middle Ages in Europe. In any case, according to Finley (1973, p. 65) it holds that "historically speaking, the institution of wage-labour is a sophisticated latecomer". Also see Wennekers (2006, p. 22).

[2] Gelderblom (2008, pp. 40–42) estimates the number of entrepreneurs in Amsterdam in the seventeenth century, based on "an official count, instigated by the town magistrate, of the

Table 2.1. Estimates from various sources for the long term development of self-employment rates in France, Sweden, the U.S., Germany, the Netherlands, and the U.K. (in %).

Rounded dates	France[a]	Sweden[b]	U.S.[c]	Germany[d]	The Netherlands[e]	U.K.[f]
1800	60.0					
1850		22.6				
1880	42.2		36.9	38.2		
1890			33.8	34.6		
1900	35.7		30.8		26.4	
1910			26.3	34.8	25.1	13
1920	37.8		23.5	33.5		
1930			20.3	32.9	20.8	12
1940			19.5	29.3		
1950		19.8	16.5	28.5	19.3	7
1960	30.1		13.0	22.6	15.8	8
1970	20.8	10.7	9.5	16.5		

Note: (most) data excludes owner-managers of incorporated businesses as well as unpaid family workers; for more statistical details consult the sources indicated below.
Sources:
[a]Toutain (1963) cited by Steinmetz and Wright (1989, p. 984); 1800/1880 in % employed, other years in % labor force.
[b]Edvinsson (2005; Tables O and Q), in % total employment.
[c]Phillips (1962, pp. 11–13); 1880–1930 cited from Bell (1940), in % all gainful workers; 1940–1970 in % labor force. Data for 1970 are from Steinmetz and Wright (1989), in % gainful workers (labor force).
[d]Steinmetz and Wright (1989), in % labor force.
[e]Wennekers (2006), in % employment.
[f]Storey (1994, p. 26); Phillips (1962, p. 23), Clark (1960, p. 514).

In the literature, we have found long term data for six countries: France, Germany, the Netherlands, Sweden, the United Kingdom, and the United States. These data are summarized in Table 2.1.

The data for France, taken from a study by Toutain (1963), go back as far as 1800. This is the oldest point estimate that we found in the literature. Self-employment in France since 1800 has seen a continuous and large decline from 60% in 1800 to almost 20% in 1970. Sweden, which traditionally has had low self-employment rates, saw its rates halved since 1850, reaching almost 10% in 1970. Germany, the Netherlands, and the United States show similar patterns; although the speed of decline was more rapid in the US. For the United Kingdom, Storey

number of active guild members in 1688". He also presents estimates for the number of farmers and other rural entrepreneurs in the province of Holland. However, it is unclear to what extent his estimates include part-time peasants with paid by-employment, unpaid family workers and other forms of solo self-employment.

(1994, p. 26) finds a decline in the self-employment rate from around 13% of the total labor force in 1910 to 8% in 1965. The relatively low level of self-employment in 1910 suggests that the UK, on the cutting edge of the First Industrial Revolution, may have had most self-employment vanish in the nineteenth century.

2.1.2 A Simple Model

A well-known reason behind the long decline of self-employment is the role of changing sector composition. In many OECD-countries, the nineteenth and early twentieth century showed a continuous decline in the share of agricultural employment, with both manufacturing and services gradually gaining ground. Following the Second World War, there was further shrinking in agricultural employment as well as some decline in the manufacturing share, while services eventually dominated employment.

In order to determine the relative importance of changes in sector composition, as compared to within-sector trends, to explain the long-term downward development of self-employment, a simple definitional model may be of use. Its core variable is the self-employment rate, i.e., the proportion of the self-employed (e) in total employment (l).[3]

By definition it holds:

$$\frac{e}{l} = \frac{l_{\mathrm{A}}}{l} \times \frac{e_{\mathrm{A}}}{l_{\mathrm{A}}} + \frac{l_{\mathrm{I}}}{l} \times \frac{e_{\mathrm{I}}}{l_{\mathrm{I}}} + \frac{l_{\mathrm{S}}}{l} \times \frac{e_{\mathrm{S}}}{l_{\mathrm{S}}} \tag{2.1}$$

where e is the number of self-employed and l total employment. The capital subscripts A, I and S refer to agriculture, industry[4] and services, respectively.

As Equation (2.1) shows, the self-employment rate in total employment can be written as a weighted sum of self-employment rates per sector, with the sector employment shares in total employment serving as weights. We are interested in the long-term developments of both self-employment rates per sector and sector shares in total employment. For this purpose, the above model, or a simplified version distinguishing between agriculture and non-agriculture only, may be applied to either time series or cross-sectional data.

[3] Alternatively one may use the total labor force.
[4] Industry usually denotes the sum of manufacturing and construction.

2.1.3 Decomposing Time Series Data

For two countries, the US and the Netherlands, a shift-share analysis of time series data for the rate of self-employment is available in the literature. Historical data for the US, assembled by Phillips (1962, pp. 7–26) from several sources, indicate that between 1880 and 1930 the proportion of the self-employed among all 'gainful workers' declined from 37% to 20%.[5] This decrease of the self-employment share is due to both a declining proportion of the self-employed within agricultural and non-agricultural employment, and to the fact that the agricultural sector, a sector where self-employment dominates, saw its share of total employment halved. Between 1930 and 1970 one can observe self-employment declining to around 9% by 1970. A shift-share analysis by Steinmetz and Wright (1989) attributes this prolonged downward trend of self-employment to both a further decline of employment in the agricultural sector and a decline of self-employment in virtually all sectors of the economy.

For the Netherlands, Wennekers and Folkeringa (2002) carried out a shift-share analysis on self-employment data for agriculture, industry, and services since 1899. Apart from the substantial influence of the shrinking employment share of agriculture between 1899 and 1960, the evidence rejects a prime role of sector shifts. On the other hand, up-scaling trends in both industry and services appear to have been the major proximate cause of the decline in self-employment rates until 1980. This conclusion obviously calls for more deeply probing research into the ultimate economic and non-economic causes underlying these broader scale trends.

2.1.4 Cross-Sectional Evidence

As shown, time series analysis of countries is hampered by the fact that for many countries no harmonized time series data seems to be available. However, another way of looking at these structural developments

[5] Based on a reclassification of Census data by Bell (1940), as cited by Phillips (1962). In addition, for the first half of the nineteenth century, the US Manufacturing Censuses of 1820 and 1850 present evidence of increasing average firm size in almost all northeastern manufacturing sectors (Sokoloff, 1984).

is through cross-sectional data for a large number of countries across a wide range of levels of economic development. Table 2.2 shows grouped national data across three per capita income categories and pertains to 1987, or the closest available year. The table is based upon Loutfi (1992, p. 42). Column 1 suggests a clear downward relationship between self-employment and the level of per capita income. The table also suggests two possible determinants. The first determinant is a declining employment share of agriculture, where self-employment remains the dominant work status across levels of economic development. The second determinant is the significant decline of self-employment in non-agriculture.

Column 6 shows a strong decline of the percentage of agricultural self-employed in total self-employment across increasing levels of economic development. This observation is corroborated by data pertaining to 1950 (Phillips, 1962, p. 23) showing a range from 83% in the Philippines to 21% in the UK.

Based on Table 2.2, we conclude that the cross-sectional patterns of sector composition and self-employment rates, across a worldwide sample ranging from low to high income countries, resemble the long-term developments of these variables as shown in Table 2.1. For additional cross-sectional evidence of the role of economic development in the historical decline of self-employment we refer to Clark (1960), Kuznets (1971), Schultz (1990) and Yamada (1996).

2.1.5 Some Stylized Facts

The available evidence thus gives rise to the following *stylized facts* that were valid until at least the early 1980s.

(1) Over the very long term, economic development has implied a decline of the self-employment rate in total employment from around 50% to around 10%.
(2) This decline is due to both a decline of the share of agricultural employment (from around 50% to around 5%) and a decline of the non-agricultural self-employment rate (from around 35% to around 10%)

Table 2.2. Self-employment (s.e.) rates by per capita income category, worldwide (circa 1987).

	(1) s.e. rate in the labor force	(2) s.e. rate in agricultural employment	(3) Implied employment share agriculture	(4) s.e. rate in non-agricult. employment	(5) Implied employment share in non-agriculture	(6) Implied % agricultural s.e. in total s.e.
Low income countries	0.48	0.58	0.52	0.37	0.48	63
Middle income countries	0.26	0.455	0.19	0.215	0.81	33
High income countries	0.115	0.49	0.05	0.095	0.95	21

Source: Columns 1, 2 and 4 are taken from Loufti (1992, p. 42), but using un-weighted average figures for the (lower and upper) middle income countries and the (lower and upper) high income countries. The implied figures in columns 3, 5 and 6 have been calculated by the present authors, using a two sector version of model (2.1), while assuming that the labor force equals total employment.

(3) Agricultural self-employment rates show no clear long term decline, but remain high, fluctuating between roughly 60% and 40%.
(4) In low-income countries, about 30% of the labor force (total employment) is self-employed in agriculture[6] and just below 20% is self-employed outside of agriculture. The corresponding figures for high income countries are 2.5% and just below 10%. Until a certain level of economic development is achieved, the major 'flow' is from agricultural self-employment to non-agricultural wage-employment.

2.2 Understanding the Long Decline

2.2.1 Role of Economic Development

Economic development can be approached in many different ways. One well-known operational notion of economic development focuses on the accompanying, interrelated processes of structural change, and is referred to as structural transformation (Syrquin, 1988, p. 206). The core components of this transformation are the accumulation of physical and human capital, as well as shifts in the sector composition of economic activity (production, employment, consumption). Related socio-economic changes include urbanization, demographic transitions, growing levels of education and changes in the distribution of income.

In economic history, one tradition distinguishes between 'stages of economic development', emphasizing the discontinuities in development. A well-known example is Rostow's theory (1960) hypothesizing five stages of economic growth. Criticisms of this theory have to do with the assumption of a unique path of development. Subsequently, Chenery and Syrquin (1986) identify three stages of transformation: primary production, industrialization and the developed economy. Economic development, in terms of structural transformation, influences self-employment through at least three changes, i.e., in sector structure, in the scale of production and in occupational choice.

[6] This can be seen by multiplying columns 1 and 6 in Table 2.2.

2.2.2 Long Term Patterns in Sector Structure Until the Late Twentieth Century

One of the first scholarly references to the importance of changing sector patterns for economic development is Sir William Petty (1690). In his *Political Arithmetick*, Petty compares the level of economic development in the seventeenth century Dutch Republic to that of England and France, and credits the far greater Dutch prosperity to their lower employment share in agriculture and higher share within manufacturing and commerce. He states: "There is much more to be gained by Manufacture than Husbandry, and by Merchandize than Manufacture" (Petty, 1690, Chapter I). Explicitly recognizing the value of Petty's work, Clark (1960) refines the analysis in the light of 'modern theoretical and statistical knowledge' and analyzes the role of transport, communication, commerce, financial and professional services in economic development. Another dominant reference on long-term patterns in sector structure is the seminal article by Chenery (1960). His empirical analysis of sector growth across 50 countries in the 1950s shows distinctive patterns. Rising *per capita* income is accompanied by changes in consumer demand, i.e., Engel's law, as well as changes in factor proportions on the supply side. Together these imply a strong decline of the share of agriculture in national output, a strong increase in manufacturing and transportation, followed with a modest increase in construction and other services. These patterns are not prescriptions for economic development and deviations are possible in the sense that a nation can increase its wealth through international trade instead of industrialization. On the whole, however, Chenery's sector growth functions describe the normal pattern of transformation accompanying economic growth in the greater part of the twentieth century. To some extent these are still relevant for developing economies.

2.2.3 Scale Economies

As early as 1867 Karl Marx 'identified two long-term causal processes that shape the fate of both the petty bourgeoisie[7] and small employers'

[7] The term 'petty bourgeoisie' refers to the self-employed without personnel.

(Steinmetz and Wright, 1989, pp. 981–982). These processes are the decline of simple (artisanal) commodity production as well as the concentration and centralization of capital (also known as the 'law of accumulation'), in which increasing returns to scale increasingly select against smaller units of production. Combined these processes led Marx and later theorists, notably the German Social Democratic theorist Kautsky (1902), to predict the 'complete disappearance of the small business sector' (quote taken from Steinmetz and Wright, 1989, p. 982).

For a long time this prediction seemed quite probable. Apart from the continual transformation of craft shops into mechanized factories, industrialization meant increasingly intensive usage of physical capital and fossil energy, thus facilitating larger scales of production. Large firms became increasingly predominant in both production and innovation activity, while firm ownership became increasingly concentrated. At the same time independent entrepreneurship waned in importance. The logical outcome of these processes, as predicted by Schumpeter (1942),[8] is the end of capitalism. Chandler (1990) stresses the importance of investment in production, distribution, and management needed to exploit economies of scale and scope from the late nineteenth century and through a large part of the twentieth century. Obviously, this continued tendency toward fewer and bigger enterprises implied less room in the market place for independent entrepreneurs. In similar vein, the well-known Bolton report (1971, pp. 75–82) attributed the continuous decline in the small firm sector to a number of factors which amount to 'an increasingly hostile environment for the small firm', including economies of scale in management, marketing and distribution, as well as increasing administrative overhead costs due to growing government regulation of wage employment and other business aspects.

[8] This publication is associated with the so-called Schumpeter Mark II regime in which large businesses dominate innovation, while the highly entrepreneurial Schumpeter Mark I regime of the late nineteenth and early twentieth century can be linked to Schumpeter's well-known *Theory of Economic Development* (Schumpeter, 1911/1934). For these two regimes also see Malerba and Orsenigo (1995) and Carree et al. (2002). Conceptually this distinction remains valid even when Langlois (2003) may be right in opposing the suggestion of an 'early' and a 'later' Schumpeter and in claiming that 'Schumpeter's ideas were remarkably consistent from at least 1926 ... until his death.'

2.2.4 Wage Levels and Occupational Choice

Finally, the continual rise of real wages throughout history has had a major influence on occupational choice. Assuming an unequal distribution of 'managerial' talent among the working population, Lucas (1978) shows how rising real wages increase the opportunity cost of self-employment, inducing marginal entrepreneurs to become employees. Iyigun and Owen (1998), assuming a distribution of risk aversion, argue that with rising economic development and as relatively 'safe' professional earnings rise, fewer individuals are willing to run the risk associated with becoming an entrepreneur.

As late as 1978, Lucas' seminal article concluded that there would be a continued decline in independent business ownership. Using his analysis, the limit of this process could be zero independent business ownership. Ultimately it is conceivable that large internet stores, chain stores and other multi-establishment corporations would prevail, because they can reap economies of scale, reduce transaction costs, and, at the same time, offer an extensive network of distribution to their customers. In the next section, we will discuss what actually happened to self-employment in the 30 years since Lucas' writings on 'the size distribution of business firms'.

3

A Revival of Independent Entrepreneurship

3.1 First Signals of a Discontinuity

3.1.1 Early Data for the 1970s and 1980s

As early as 1980, the US Bureau of Labor Statistics identifies an apparent reversal in the downward trend of the non-agricultural self-employment rate, beginning in the early 1970s (Fain, 1980). At the same time, Birch (1979) is the first to show that small firms make a disproportionately large contribution to job creation. It becomes increasingly clear that fundamental transformations are changing some of the most advanced capitalist economies. In this respect, Piore and Sabel (1984) talk of the 'Second Industrial Divide'. An empirical analysis by Blau (1987) attributes the reversal in the downward trend of the US self-employment rate to changes in industrial structure and technology and to institutional (fiscal) changes in the American economy. Steinmetz and Wright (1989) perform a time series analysis confirming that the 'rise in self-employment since the middle 1970s is statistically significant'. In addition, a shift-share analysis for the period 1970–1980 brings out the employment growth of post-industrial sectors such as business and professional services combined with an increase of the

self-employment rate in traditional sectors such as construction and parts of manufacturing.

Taking a slightly different angle by focusing on small business presence, Loveman and Sengenberger (1991) document the major developments in firm size distribution for six of the largest OECD countries, across various time spans through the mid 1980s. They conclude that "after many decades of decline, the employment share of SMEs began to increase in the 1970s, though at different rates in different countries and sectors." Loveman and Sengenberger attribute the re-emergence of small-scale production to the decentralization and vertical disintegration of large companies and to various kinds of new small business dynamism, more so than to sectoral changes toward the service sector or to effects emanating from the business cycle. A volume edited by Acs and Audretsch (1993, p. 227) concludes that in the 1970s and 1980s "a distinct and consistent shift away from large firms and toward small enterprises has occurred within the manufacturing sector" across several Western countries. Acs et al. (1994), the first to investigate the variations in self-employment rates across a large panel of OECD countries for a longer period (1966–1990), report a U-shaped time pattern for the total self-employment rate in a sample of 12 OECD countries for which data were available for the whole period.

3.1.2 Detailed Data for the OECD Area Up to 2007

In fact, most although not all developed economies witnessed a reversal in the long-term decline of business ownership rates, while the attention given to entrepreneurship by both policymakers and social scientists around the world surged. Table 3.1 presents an overview of business ownership rates, excluding the primary sector, across 23 OECD-countries in 1972, 1990, and 2007. Between 1972 and 1990, the average rate of non-agricultural business ownership across these countries increased from 10.0% to 11.3% of the total labor force, subsequently remaining fairly stable during the period from 1990 to 1998, and falling to 10.6% in 2002. Since then business ownership slightly increased until a level of 10.8% in 2007. At present, 17 of these 23 advanced economies have a business ownership rate between 8% and

Table 3.1. Non-agricultural business ownership in 23 OECD-countries, 1972, 1990 and 2007.

Country	Number of business owners (×1,000)			Business ownership rate in labor force (%)		
	1972	**1990**	**2007**	**1972**	**1990**	**2007**
Austria	281	254	395	9.3	7.2	9.4
Belgium	423	499	543	11.1	11.9	11.3
Denmark	200	182	201	8.2	6.3	6.9
Finland	145	211	229	6.6	8.2	8.5
France	2,468	2,431	2,414	11.3	9.8	8.7
Germany[a]	2,070	2,186	4,059	7.6	7.2	9.7
Greece	524	775	976	16.1	19.4	19.8
Ireland	86	143	255	7.7	10.9	11.6
Italy	3,190	4,635	5,230	16.2	19.9	21.0
Luxembourg	15.6	12.4	16.9	10.5	6.5	4.9
Netherlands	564	562	1,053	9.7	8.2	12.0
Portugal	435	688	715	12.1	13.9	13.1
Spain	1,551	1,924	2,993	11.6	12.3	13.5
Sweden	292	313	411	7.4	6.9	8.8
United Kingdom	2,002	3,257	3,537	7.9	11.4	11.4
EU-15	**14,248**	**18,072**	**23,027**	**10.4**	**11.5**	**12.2**
Iceland	9.4	13.3	19.6	9.6	9.4	10.8
Norway	165	165	214	9.7	7.7	8.5
Switzerland	225	274	312	6.3	6.9	6.8
United States	7,354	13,908	15,197	8.2	10.8	9.9
Japan	6,479	7,432	5,715	12.5	11.6	8.6
Canada	734	1,563	2,237	7.9	10.8	12.2
Australia	734	1,312	1,605	12.6	15.5	14.8
New Zealand	138	197	287	10.6	11.8	12.8
Total	**30,086**	**42,936**	**48,615**	**10.0**	**11.3**	**10.8**

[a]West-Germany for 1972 and 1990.

Note: Business ownership is defined as including both the owner-managers of incorporated and unincorporated businesses, but excluding unpaid family workers and wage-and-salary workers operating a side-business as a secondary work activity. Business owners in the primary sectors of economy are also excluded. See Van Stel (2005).

Source: EIM, COMPENDIA 2007.1 database (see www.entrepreneurship-sme.eu).

14%, while three (Denmark, Switzerland and Luxembourg) have rates below this range and three (Australia, Greece and Italy) are above.

Despite the seemingly small net increase (between 1972 and 2007) in the average business ownership share of these 23 OECD countries, it nevertheless implies an annual growth rate of the number of business owners that is even greater than the annual growth rate of the total labor force (1.38% versus 1.15%). In terms of absolute growth over the 35 year period, an increase of 18.5 million owner-managers occurred, reaching 48.6 million owner-managers by 2007.

Sixteen countries achieved net growth in their business ownership shares between 1972 and 2007. Of these, the greatest absolute increase of the business ownership rate from the lowest point, which was not necessarily in 1972, through 2007, was in Italy (5% points), Canada (4.8% points), Greece, Ireland, the Netherlands, the UK and New Zealand (all above 3.5% points). Canada saw its independent entrepreneurship rates increase by 6.6% points between 1973 and 1998, a rise tempered by a decrease of 1.8% points in the following decade. Five countries experienced a net decline of the business ownership rate between 1972 and 2007, while two, Austria and Belgium, remained relatively stable. Of the latter countries, Austria experienced a strong increase from a low point in 1985. Luxembourg and Japan did not show any significant increase since the 1970s.

The timing and pattern of change vary greatly across individual countries. For the United States and Australia growth occurred primarily in the 1970s and 1980s.[1] Several countries, including Greece, Ireland, Italy, the United Kingdom, Switzerland, Canada and New Zealand, saw a rise in their business ownership rate until the mid- or late 1990s followed with some stabilization or minor decline thereafter. From 1998 through 2006, Belgium saw a decline in its self-employment rate with 1.5% point, after a strong revival that occurred between 1980 and 1998. In various other countries, including Austria, Finland, Germany, Iceland, the Netherlands, Spain, and Sweden, the reversal in the rate of business ownership did not start until the 1980s or 1990s, with rates continuing to increase until 2006 or 2007. In France and Norway, the long-term decline of business ownership continued until the dawn of the twenty first century, with a revival seen in its first decade. Of the two countries without any growth of their business ownership rate in the past 30 years, as mentioned above, Luxembourg had a continual decline in business ownership rate throughout the entire period 1972–2007, while Japan's sharp and ongoing decline began in the early 1980s.

In brief, most OECD countries saw a reversal in the steady decline of the business ownership rate sometime after 1970. This reversal is related

[1] Despite a subsequent period of stabilization, including a decline between 1993 and 2002, the United States still accounts for the greatest number of business owners: as of 2007, more than 30% of all business owners from these 23 countries are in the United States.

to fundamental changes in the economy.[2] This 'shift from the managed to the entrepreneurial economy' (Audretsch and Thurik, 2000, 2001) reversed a downward trend that started well before 1900. However, the COMPENDIA database underlying Table 3.1 also shows that in several Anglo-Saxon countries business ownership rates have stabilized after the 1990s, while in other countries business ownership rates declined somewhat after 1997. It is too early to determine whether this decline was cyclical or structural. In several countries the business ownership rate recovered after 2002, suggesting that the preceding decrease may have been temporary.

3.2 Empirical Evidence of a Structural Shift

This section summarizes the results of ongoing empirical analysis in order to answer the following two questions: first, does the underlying trend of business ownership rates in economically highly developed nations show a *structural* shift in the sense of a revival (U-shape)[3] or at least a stabilization (L-shape), or is the underlying trend still negative? Secondly, to what extent are trends and fluctuations in business ownership related to the level of economic development and/or to other determinants?

Carree et al. (2002, 2007) introduce a model of the interrelationship between business ownership and economic development (measured as per capita income), at the country level.[4] The model consists of three equations. The first equation explains changes in the rate of business ownership from an error-correction process towards an 'equilibrium rate' (the percentage in the labor force that the individual country rates tend to). The second equation determines the economic growth penalty of the rate of business ownership being 'out-of-equilibrium'.[5] A third

[2] These changes will be discussed below.

[3] Clearly, in the long term a U-shape does not hold because the business ownership rate is bounded by its definitional maximum. Long before reaching this maximum it will level off. However, a structural shift may be captured using a U-shape.

[4] See the appendix for a detailed description of this model.

[5] Carree et al. (2002) indeed find empirical support for the existence of a growth penalty, implying that an 'optimal' business ownership rate exists: from a perspective of economic growth, economies can have too few but also too many business owners. Van Praag and

equation, describing the 'equilibrium rate' of business ownership as a function of per capita income, is substituted into the first. This model can be used to investigate whether the assumed underlying 'equilibrium rate' of business ownership in OECD countries has shown a U-shaped or an L-shaped relationship with per capita GDP over the past 30 years. In the longer run, the implications of a U-shape versus an L-shape for both the labor market and the firm size distribution would be quite different. A U-shape would imply that, in the coming decades, business ownership rates in the very high income countries will increase structurally. On the contrary, an L-shape means that the underlying (declining) rates will gradually converge to a certain level, while observed increases in actual business ownership rates are to be interpreted as temporary fluctuations or as 'error corrections'. The empirical research so far was inconclusive. Carree et al. (2002) suggested a slightly better fit of the U-curve, while Carree et al. (2007), using more recent data, finds the L-shape performing somewhat better. In both analyses, the difference between the two curves is not statistically significant. Additionally, for the manufacturing and service sector Van Stel and Carree (2004) find that either the U- or L-shape provide comparable fits.

In Table 3.2, key results taken from Carree et al. (2007) are presented. Obviously, passing through a minimum rate of 8.2% during the 1970s and 1980s, while successively increasing after (on the U-shape), implies a different long-term scenario for the rate of independent entrepreneurship than a gradual decline toward an asymptote of 4.7% (on the L-shape). In 25 years, at a normal rate of economic progress, the U-shape predicts a future increase in the 'equilibrium rate' toward a level of 12% while the L-shape implies a historically low 'equilibrium' business ownership around 7%. However, *prima facie* inspection of the data for the US, presented in Figure 3.1, lends no obvious support for either an upswing or for a continual decline in the rates. In fact, the US data suggests that a stabilization of business ownership rates around 10%, two percentage points above the low level of the early 1970s, may be a more likely development in the short term. On the other hand,

van Stel (2010), using a Cobb–Douglas production function model, estimate this optimal business ownership rate to lie around 12.5%.

Table 3.2. Relating the assumed 'equilibrium rate' of business ownership to the level of economic development (implied results from the estimated equation for four year changes in the observed rate of business ownership, 1980–2004).

	U-shaped relationship with per capita income	L-shaped relationship with per capita income
Constant	0.244***	1.180***
	(5.0)	(4.6)
Per capita income (linear)	−0.011*	
	(1.9)	
Per capita income (squared)	0.00018	
	(1.1)	
Per capita income (inverse)		1.133***
		(4.2)
Minimum rate	0.082	
Asymptote		0.047
Observations	161	161

Absolute t-values are in parentheses.
***Significant at 0.01 level; **Significant at 0.05 level; *Significant at 0.10 level.
Source: Carree et al. (2007).

annual data for several other countries show a continued upswing in business ownership rates.

Analyses by Carree et al. (2002, 2007) show a slow, but significant, error-correction process: differences in business ownership rates across countries with a similar GDP per capita tend to disappear slowly over time.[6] Carree et al. (2007) estimate the speed of the error-correction process to be 13% per 4-year period. This means that it takes two decades for the difference between a country's actual business ownership rate and the 'equilibrium rate' to halve. These results may be influenced by the recent introduction of entrepreneurship policies by countries of which the business ownership rates appear to fall behind those of other highly developed countries.

Finally, as it may be intuitively clear from Figure 3.1, the explanatory power of the first equation in the Carree et al. model explaining the change in business ownership, as measured by the adjusted R^2, is quite modest. This suggests that, apart from error correction, many more determinants of variations in business ownership rates are at play. Likely factors include economic variables, such as the unemployment rate and net profits of independent small businesses, as well

[6] Italy is an exception here. There are idiosyncratic factors discussed in Section 3.4.

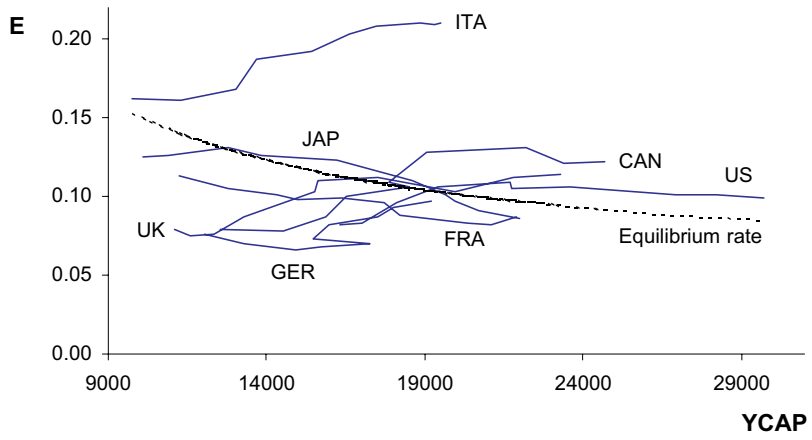

Fig. 3.1 The estimated 'equilibrium rate' and the actual rates of business ownership for G7-countries, as a function of per capita GDP, expressed in purchasing power parities per US $ at 1990 prices.
Note: plotted data for the 'equilibrium rate' are derived from the inverse 'equilibrium rate' or L-shape curve, estimated by Carree et al. (2007). Plotted data for the actual business ownership rates are updated on the basis of Table 3.1, using data over the period 1972–2007.

as demographic, cultural and institutional determinants[7] (Wennekers et al., 2002).

3.3 Driving Forces

In general, the growing level of *per capita* income and its corollaries on the one hand, and global trends such as the invention and worldwide diffusion of new information and communication technology on the other, are the major driving forces of the apparent reversal in the business ownership or, equivalently, independent entrepreneurship rate.

3.3.1 Corollaries of Economic Development

Earlier, three stages of economic development were introduced: primary production, industrialization, and the developed economy

[7] Cultural, institutional, and other structural factors may lead countries to deviate from the theoretical 'equilibrium rate' related to their level of economic development, but it might also be the case that the 'equilibrium' itself differs between specific (groups of) countries. Carree et al. (2002, 2007) assume a unique 'equilibrium function' for all countries present in their database.

(Chenery and Syrquin, 1986). These affect self-employment through accompanying changes in sector structure, the scale of production, occupational choice and, most prominently in the third stage, the role of new knowledge. While the corollaries of the second stage are relevant for understanding 'the long decline of entrepreneurship', the third stage's accompanying changes need to be understood within the context of the increasing rates of business ownership since the late 1970s.

3.3.2 The Service Economy

A prominent corollary of the third stage of economic development is a strongly increasing share of the services sector in total employment (Inman, 1985). While in 1900 the share of services[8] in the most highly developed economies was about one-third of total employment, a century later it was in excess of 70% (ILO, 1956, 2006). At the same time, the employment share of the industrial sector initially rose to 40% or more in the 1950s; by 2000 this had dropped to nearly 25%. An early analysis of the increasing share of services is by Baumol (1967).[9] The most important underlying causes are a relatively high income elasticity of the consumption of personal and social services, a trend in recent decades toward the outsourcing of producer services and the relatively low labor productivity growth of services vis-à-vis manufacturing. The share of services is relevant for self-employment because average firm size for many services is smaller than in manufacturing, and entry barriers are considerably lower. However, a shift-share analysis of the rising self-employment rate in the Netherlands since 1980 suggests only a minor impact of the increasing share of services, and a dominant influence of downscaling trends within major sectors of industry (Wennekers and Folkeringa, 2002). For other countries, other authors also find a positive influence of the sectoral shift from manufacturing to services on the rate of self-employment (Acs et al., 1994; Blau, 1987).

[8] Total services include distributive services, producer services, personal services, and social services.

[9] Echevarria (1997) presents a more advanced model of a two-way causation between sector composition and economic growth.

3.3.3 Declining Scale Economies Due to a Differentiation of Consumer Preferences

Over the past decades individual wealth has increased considerably throughout the OECD. Consequently consumer preferences and demand have shown growing differentiation (see also Jackson, 1984) and, hence, business opportunities. Until the 1970s consumer demand was served by fewer and fewer firms, each enjoying increasing economies of scale and scope (Chandler, 1990). The conglomerate merger wave of the late 1960s appeared to intensify this concentration, but it turned out to be a bridge too far. Many of the resulting conglomerates either disappeared or divested in the years that followed. Niche markets were a factor dooming conglomerates: the individuals, often with substantial income and wealth, seeking specialized products were increasingly unable to buy them from the conglomerates. Large firms unable to fill all such niche markets loose ground, ultimately choosing to decrease diversification activities (Jovanovic, 1993).[10] Meanwhile small and new firms or self-employed individuals focusing on niche markets gain ground.

3.3.4 Occupational Choice

On the supply side of entrepreneurship, Maslow's (1970) theory of motivation and human needs, the latter ranging from physical needs to need for self-actualization, may also be relevant for occupational choice. Once the basic material and social needs are satisfied, a still higher level of prosperity gives prominence to the need for autonomy and self-realization which makes self-employment a more attractive option. Survey research of the self-employed supports this hypothesis (Van Gelderen, 2004; Pleijster and van der Valk, 2007). Survey research consistently shows that, in spite of longer work hours, poorer working conditions and other disadvantageous factors, self-employed people have greater job-satisfaction than employees, at least in developed economies (Blanchflower and Oswald, 1998; Blanchflower, 2000;

[10] However, in recent years, ICT and globalization seem to enable large corporations to combine standardization and differentiation through so-called mass customization.

Hamilton, 2000; OECD, 2000), and this seems somewhat related to the higher autonomy of independent entrepreneurs. Additionally, a rising level of economic development stimulates the supply of entrepreneurship through an increasing availability of financial resources for business start-ups, through savings, inheritances and home ownership.

3.3.5 The Knowledge Economy

In a modern view of economic development, as propagated by Porter et al. (2002), advanced development implies the evolution from a resource-based to a knowledge-based economy. These authors distinguish between three stages and two transitions. At the lowest levels of economic development, production is based upon the mobilization of primary factors of production: land, primary commodities, and unskilled labor. At this *factor-driven stage*, international competitiveness is primarily based upon low factor costs and/or the presence of minerals and other commodities. As countries move to the second stage, that of industrialization, economic growth becomes more capital intensive and thus *investment-driven*. The third, *innovation-driven stage*, is that of a technology generating economy. According to Porter et al. (2002, p. 17), countries reaching this stage innovate at the global technological frontier in at least some sectors. This stage also implies a high level of per capita income. Transitioning to this stage requires not just developing the ability to generate new knowledge, but also to commercialize it. This entails intensive cooperation between universities, private businesses and government. Once a critical mass of knowledge, technologies, skills, and purchasing power is built up, innovation can achieve increasing returns to scale. This will fuel a self-perpetuating cycle of continuing innovation and long-term economic growth (Sachs, 2000). This is a knowledge economy.

3.3.6 Global Trends

In the 1980s and 1990s, the invention and worldwide diffusion of new information and communication technologies started the third

Industrial Revolution (Jensen, 1993),[11] ushering in a new phase of 'creative destruction' where entrepreneurs challenge incumbent firms by introducing new inventions that make current technologies and products obsolete (Carree et al., 2002). Consequently in many sectors, the scale necessary to survive is considerably smaller than before. Jensen (1993, p. 842) argues that 'smaller, more efficient, entrepreneurial organizing units that cooperate through technology' have gained prominence in the economy. Affordable computers make small-scale production possible while the Internet has made networking and reaching customers around the world much easier for small and new companies. Many of the labor and capital-intensive parts of production are now divested and are either relocated to emerging economies like China and India or outsourced to specialized small firms. In this environment of rapid technological change and globalization, firms concentrate on 'core competences'.

Additionally globalization combined with the revolution in telecommunications and computers has drastically reduced the cost of shifting not just capital but also information from high-cost locations to lower-cost locations around the world. This means that economic activity in high-cost locations is no longer compatible with routinized tasks. Rather, globalization shifts the comparative advantage of high-cost locations to knowledge-based activities, and in particular search activities, which cannot be costlessly transferred around the globe (Audretsch, 2007). Knowledge, as an input into economic activity, is characterized by high uncertainty, high asymmetries across people, and is costly to transact (Thurik and Wennekers, 2004).[12]

The implied shift away from corporate management toward entrepreneurial formations is further supported by a widespread

[11] Alternatively, Piore and Sabel (1984) use the term 'Industrial Divide', while Freeman and Perez (1988) refer to the transition from the fourth to the fifth Kondratiev wave. Audretsch and Thurik (2000, 2001) refer to the switch from the managed to the entrepreneurial economy.

[12] Knowledge, as opposed to information, is often highly specific in nature and therefore difficult to transmit through formal means of communication. Face-to-face contacts are important for the diffusion of knowledge (Audretsch and Thurik, 1999; Storper and Venables, 2004).

tendency toward market deregulation. In order to survive this complex and turbulent environment, incumbent firms participate in strategic partnerships with heterogeneous enterprises, giving them flexibility and responsiveness combined with cost efficiency. This emerging 'network economy' creates new opportunities for specialized, small enterprises.[13] Consequently other factors not necessarily related to the level of economic development may also be at play in inducing the present revival of independent entrepreneurship.

Finally, governments are stimulating entrepreneurial initiatives. For examples of entrepreneurship policies in the US and in Asia, see EIM (2009). Examples in Europe include the gradual abolishment of entry requirements in the Netherlands (Carree and Nijkamp, 2001), Italy's 1998 Bersani Law (Carree et al., 2008), and the 2003 French law reform (Insee, 2008).[14] Many European initiatives to decrease the time and effort needed to start up a company intend to stimulate entrepreneurial activity.[15] Privatization efforts, like those in the telecom, energy and health care sector, are opening up opportunities for new and small enterprises. At least until recently, government's role has decreased in most countries. This is especially true in formerly Communist countries, where independent entrepreneurship is increasing, almost by definition, since before there was legally none.

In sum, the service economy is at the same time a knowledge economy, a network economy and an entrepreneurial economy.

3.4 Variation Across Countries

3.4.1 Role of Institutional and Cultural Factors

Notwithstanding the influence of economic development and global trends, the level of independent entrepreneurship, as shown in

[13] For a literature review on networks, see for example Havnes and Senneseth (2001) and Hulsink (2005, pp. 21–24).

[14] 'La loi pour l'initiative économique d'août 2003' aims to simplify the creation of new enterprises and to promote the transition from wage employment to self-employment (Insee, 2008).

[15] Using different models but similar data sets, both Grilo and Irigoyen (2006) and Grilo and Thurik (2008) show that the perception of administrative burdens hampers entrepreneurial activities.

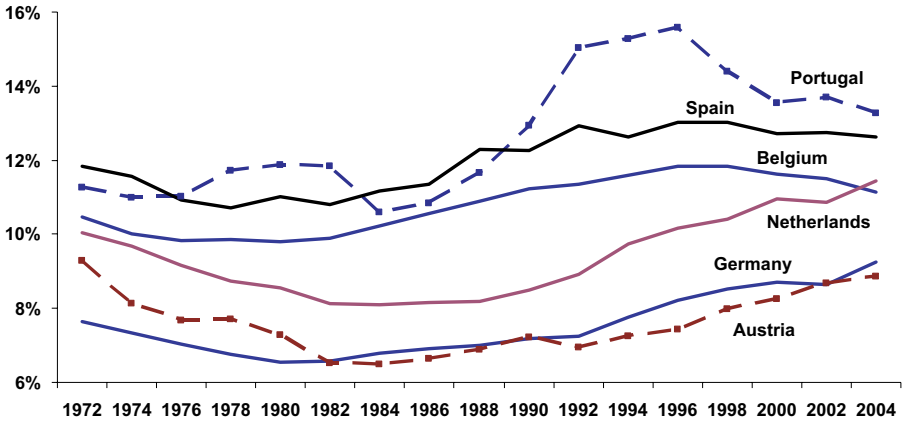

Fig. 3.2 Rate of business ownership in six OECD countries.
Source: Freytag and Thurik (2007).

Table 3.1, differs widely even among highly developed economies. Figure 3.2 shows the persistent differences in business ownership rates for six of these countries for which a U-shaped development can be observed. While economic development is probably the main driver of the U-shape, persistent differences between countries point to demographic, cultural, and institutional factors that tend to remain relatively stable over time.

Thus the explanation of the independent entrepreneurship rate at the country level clearly belongs to the realm of multidisciplinary investigations. See Verheul et al. (2002) for such an 'eclectic' framework and Wennekers et al. (2002) as well as Audretsch et al. (2007) for updates. Other investigations also use the 'eclectic' approach.[16] Typically, multidisciplinary investigations attempt to bring together elements from distinct fields.

The framework used by Verheul et al. (2002) combines various disciplines, including institutional economics, psychology, sociology and anthropology, three levels — micro, meso, and macro — of analysis, and classifies the explanatory factors into two categories — supply and demand side. From the demand side the framework focuses on factors

[16] See Stevenson and Lundström (2007) and the GEM Global Reports of the Global Entrepreneurship Monitor (www.gemconsortium.org).

influencing the industrial structure and the diversity of consumers' tastes, such as technological development, globalization, and changing standards of living. The supply side examines various structural characteristics of the population and how these affect the probabilities of someone becoming an entrepreneur. Population growth, urbanization rates, age structure, participation of women in the labor market, income levels, and unemployment are examples of such factors. While the supply and demand sides refer to the macro and meso levels, the eclectic framework includes how and why individuals decide to become self-employed instead of seeking other job opportunities.

Beyond personal characteristics, the business environment also plays a crucial role. From a policy perspective these "framework conditions" are aspects offering the widest scope for action. Institutional issues such as the fiscal environment, labor market regulations, administrative complexities, intellectual property rights, bankruptcy law, education, and training are critical in influencing an economy's entrepreneurship rate. Finally, cultural aspects shape the business environment. It is plausible that differences in individual values and beliefs influence a wide range of behaviors including the choice between becoming self-employed or working for others. There are three fundamental views (Wennekers, 2006). The first view is the 'aggregate psychological trait' explanation of entrepreneurship which suggests that if a society contains more people with 'entrepreneurial values', more people will become entrepreneurs (Davidsson, 1995). The second perspective looks at degrees of 'legitimation' or 'moral approval' of entrepreneurship within a culture (Etzioni, 1987). In this view, if there is a higher level of 'legitimation' of entrepreneurship, then it will manifest itself widely, resulting in more attention for entrepreneurship within the educational system, a higher social status of entrepreneurs, and more tax incentives to encourage business start-ups. Obviously, this results in higher demand for, and supply of, entrepreneurship (Etzioni, 1987). The third view, the 'push' explanation of entrepreneurship, argues that, in predominantly non-entrepreneurial cultures, a clash of values may drive entrepreneurial employees away from the average (non-entrepreneurial) organization and into self-employment

(Baum et al., 1993; Noorderhaven et al., 2004). This 'push' perspective is the inverse of the 'legitimation' view.

3.4.2 Typology of OECD Countries

Based on a mix of the above mentioned economic and non-economic factors, the OECD countries in Table 3.1 can be distinguished into four main groups with Japan and Luxembourg being special cases. The four groups are Mediterranean countries, Scandinavian countries, Western European countries and Anglo-Saxon countries. The Mediterranean countries, including Greece, Italy, Portugal and Spain, have relatively high business ownership rates, related to, among others, a relatively low GDP per capita among the OECD countries and relatively high life dissatisfaction rates. Italy's high business ownership rates reflect an abundance of small firms in artisan, retail and personal services firms, partly due to its high level of family-based social capital, while its high employment protection[17] may have stimulated outsourcing (Arum and Müller, 2004, p. 21). The Scandinavian countries of Denmark, Finland, Norway, and Sweden have the lowest business ownership rates. These countries share several characteristics associated with lower business ownership rates, including a high per capita income, high female labor participation rates, a low degree of income inequality, a large public sector, and a concentration of large business. In a certain sense, France could be considered part of this group of countries, with its system of centralized planning and control combined with strong public participation in large 'national champion' companies. However, it also shares some characteristics with the somewhat mixed group of five Western European countries of Austria, Belgium, Germany, the Netherlands and Switzerland. These countries have neither unusually high nor low business ownership rates, but the business ownership is in the traditionally strong small business sector and there is a limited

[17] Arum and Müller (2004, p. 21) hypothesize that 'labor market regulation will likely manifest a curvilinear relationship, with pressures for self-employment highest at either end of the continuum'. At the low end of labor market protection 'there are few incentives for workers to stay in dependent employment', while at the high end 'employers have greater incentives to outsource economic production'.

amount of new business venturing. The last group is the Anglo-Saxon countries of Australia, Canada, Ireland, New Zealand, United Kingdom and United States. These countries tend to combine a high level of development with both relatively high levels of business ownership and early-stage entrepreneurial activity. These countries share several cultural and institutional characteristics, including high individualism, low social security expenditures, a low degree of employment protection, and low barriers to entry (OECD, 1999; Hofstede, 2001; Fonseca et al., 2001).

3.5 Entrepreneurial Dynamics

The U-shaped relationship between economic development and independent entrepreneurship may not only be valid for static measures of entrepreneurship such as the business ownership rate, but also for dynamic measures of entrepreneurship, such as the number of nascent entrepreneurs (Wennekers et al., 2005).[18] It can be argued that the underlying mechanism of the U-shaped relationship between economic development and business ownership also applies to economic development's relationship with nascent entrepreneurship and other dynamic measures of entrepreneurship. Modern economies are characterized by high levels of uncertainty related to globalization and the advancing state of information and communication technology (ICT). Globalization and ICT stimulate outsourcing and create many possibilities to exploit new ideas thus resulting in many new-firm start-ups. However, uncertainty makes it unclear which new ideas will be successful and which ideas will not. Through market selection and its revealing of preferences, the viable firms and ideas survive, but many new firms exit because consumers fail to respond to the offers. Hence, at the macro-level there are high levels of gross entry and exit ultimately associated with moderate net entry. As the relationship between economic development and static measures of entrepreneurship captures this net-entry

[18] Static measures of entrepreneurship measure the stock of all firms or business owners (both new and incumbent) in an economy, while dynamic measures of entrepreneurship measure the number of *new* firms (i.e., start-ups) or *new* entrepreneurs (those who recently started a business) and may also include measures of the number of individuals who are in the process of starting a business (i.e., nascent entrepreneurs).

effect, and the relationship with dynamic measures captures the gross-entry effect, the upward trend of the U-shape should be stronger for dynamic measures of entrepreneurship than for static ones.

Wennekers et al. (2005) investigate the relationship between a country's nascent entrepreneurial activity rate in 2002 and its level of economic development using data taken from the Adult Population Survey of the Global Entrepreneurship Monitor research program. This database contains various entrepreneurial measures constructed on the basis of surveys of at least 2,000 respondents per country (Reynolds et al., 2005). The nascent entrepreneurship rate is defined as the percentage of the adult population[19] actively involved in starting a new business. Empirical evidence supports a U-shaped relationship in 2002 between nascent entrepreneurship and two indicators of economic development: per capita income and an innovative capacity index constructed by the World Economic Forum (WEF) within the framework of the Global Competitiveness Report (Wennekers et al., 2005). Furthermore, additional likelihood ratio tests show an L-shaped relationship to have a poorer statistical fit, although the difference is not significant. However, a linearly decreasing specification was formally rejected (Van Stel et al., 2004). In addition, the overall U-shaped relationship was found to be based on an underlying quadratic relationship with so-called opportunity entrepreneurship, while necessity entrepreneurship is a decreasing function of per capita income.

A second important measure of entrepreneurial dynamics created by GEM is the young business entrepreneurial activity rate, defined as the percentage of the adult population that is the owner/manager of a business less than 42 months old. The sum of the nascent and the young business entrepreneurial activity rate is called the Total early-stage Entrepreneurial Activity rate (TEA). Table 3.3 presents the results when the Wennekers et al. (2005) exercise is repeated using the 2007 TEA index as the dynamic measure of entrepreneurship and per capita income in purchasing power parities (source IMF, World Economic Outlook) as the measure of economic development. As both the linear and the squared terms are highly significant (at 1% level),

[19] The adult population is defined as being between 18 and 64 years of age.

Table 3.3. Relating Total early-stage Entrepreneurial Activity (2007) to the level of economic development as measured by per capita income.

	U-shaped relationship with per capita income
Constant	21.4***
	(7.2)
Per capita income	−1.01***
	(3.5)
Per capita income, squared	0.016***
	(2.8)
Adjusted R^2	0.335
Observations	42

Absolute t-values in parentheses.
***Significant at 0.01 level.

we conclude that the U-shaped relationship with per capita income is valid not only for 2002 but also for 2007. Hence, the U-shaped relationship appears stable over time, indicating that in modern economies early-stage entrepreneurial activity increases with economic development. Figure 3.3, taken from Bosma et al. (2008), illustrates the U-shaped relationship between per capita income and Total early-stage Entrepreneurial Activity (TEA) in 2007.

3.6 A Partial Renaissance?

A refinement of the analysis considers how conclusions change if we differentiate between business owners with and without personnel. Steinmetz and Wright (1989, p. 1008) hypothesized 'that very little of the expansion of self-employment would be among small employers but, rather, would be concentrated in the individual self-employed petty bourgeoisie'. More recently, OECD (2000) presented statistical indications on the importance of distinguishing between employers and own account workers across the range of the economically developed countries. Between 1983 and 1997, the proportion of own account workers in self-employment rose in Australia, Belgium, Canada, Germany and the UK, while it decreased in France, Greece and Japan (OECD, 2000, Table 5.4). Unfortunately, for many OECD countries a long time series is unavailable. Arum and Müller (2004, p. 453), concluding from an international comparative research project into recent self-employment

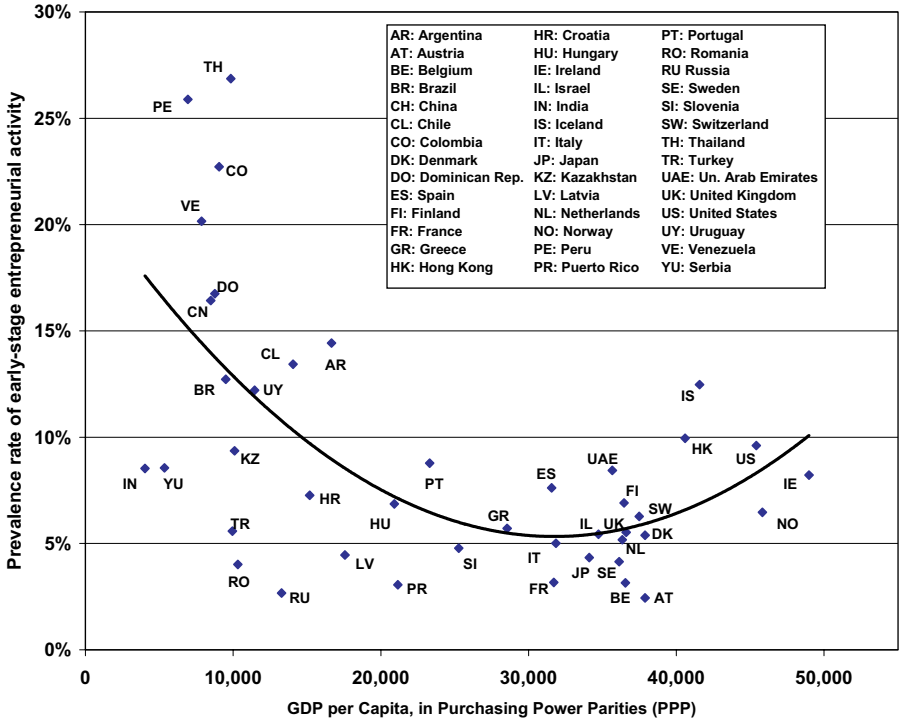

Fig. 3.3 The U-shaped relationship between TEA and per capita income (2007). *Source*: Bosma et al. (2008).

trends in eleven countries, also emphasize the high and increasing share of solo self-employment.

Recently Boegenhold and Fachinger (2007) published detailed estimates[20] for Germany concerning the numbers of both solo self-employed and self-employed with employees between 1991 and 2004. These data suggest[21] that solo self-employment is a growing share of total self-employment, increasing from about 45% in 1991 to about 54% in 2004. This development reflects an estimated growth in the prevalence of solo self-employed in the total labor force from about 3.7% to about 5.7%, while the prevalence of the self-employed with employees

[20] These estimates are calculations by Boegenhold and Fachinger on the basis of the files of the German *Microzensus*.

[21] Boegenhold and Fachinger have not published their estimates in tables but only by way of figures. The data presented are derived from Figures 2 and 3 in their work.

only increased from 4.5% to 5.0%. In fact, this modest increase was entirely realized in the first half of the 1990s. Since 1995 the share of self-employed with employees has stagnated, while the share of solo self-employment has accelerated. These remarkable developments are unrelated to German re-unification. Boegenhold and Fachinger's estimates for the share of solo self-employment in West Germany in the period 1989–2004 show a similar increase. Additionally, developments are 'nearly identical' for both female and male entrepreneurs. The only difference is a 15% points higher *level* of solo self-employment for women than for men. Finally, an increase of the number of solo self-employed is especially visible in the 'liberal' professions and freelance occupations, including medical doctors, legal professionals, therapeutic and social work professionals, consultants, computer specialists, journalists, and creative and entertainment professionals.

Weighing the available evidence, we hypothesize that a renaissance of solo self-employment may be the dominant development in many advanced post-industrial economies, while the share of small employers is stagnating or showing a modest increase. Obviously, more and internationally comparable statistical data on the prevalence of own account workers are needed to test this hypothesis.

4

The Revival of Entrepreneurship: An Interpretation

4.1 Introduction

We now attempt to interpret the empirical findings. Section 4.2 discusses the extent to which the so-called shift from the 'managed' to the 'entrepreneurial' economy is a labor market phenomenon. More precisely, we argue that, to a large extent, the revival of entrepreneurship should be principally viewed as a socio-economic response to new push and pull factors within the labor market.

While push and pull factors in the labor market play a major role, in Section 4.3 the role of technological trends is evaluated. In particular, the ICT revolution has changed the fundamental parameters underlying the relationship between entrepreneurship and innovation. This can be interpreted as a reversion from a Schumpeter Mark II regime to Schumpeter Mark I.

4.2 Fundamental Changes in the Labor Market

As shown in Section 3.6, in many advanced service economies more than 50% of the self-employed have no personnel, and the share of these 'own account workers' or 'solo self-employed' appears to be increasing.

However, solo self-employment is a diverse category, including solo entrepreneurs with an ambition to let their new business grow at the one end of the spectrum, 'quasi self-employed' still working for their previous employer at the other end, and all kinds of independent handymen, craftsmen and freelance professionals in the middle range. Solo self-employed are found across a wide variety of sectors, including 'traditional' sectors such as manufacturing, construction, and transportation as well as 'post-industrial' sectors such as personal and business services. This wide-ranging rise of solo self-employment is driven by several fundamental changes both on the demand and supply sides of the labor market.

4.2.1 Demand Side

There is a large literature on the outsourcing and subcontracting of activities to other businesses, a growing trend apparent since the 1980s (Piore and Sabel, 1984; Carlsson, 1989; Jovanovic, 1993; Abramovsky and Griffith, 2006; Merino and Rodriquez, 2007). Against this background there is a tendency for employer firms to subcontract to the solo self-employed. According to Steinmetz and Wright (1989) underlying reasons fall into two broad categories: first, attempts to bypass labor unions with their influence on business operations; and secondly, employer strategies to reduce wages and other financial obligations such as continued wage payments during slack, illness and maternity leave as well as employers' contributions to social security.

A second demand side cause of growing solo self-employment is an apparent decline of good jobs.[1] Steinmetz and Wright (1989, p. 1008) cite several commentators observing a decline of 'well-paying core industrial and public sector jobs' together with an increase of 'low-paying jobs in the service sector'. Beck (2000, p. 67) views the spread of temporary and insecure employment with the disappearance of the 'job for life' from the perspective of an assumed transition 'from the work society to the risk society'. In this respect, he describes the rise of 'nomadic multi-activity' in which an increasing number of people have

[1] This second demand side cause of the rise of solo self-employment can also be interpreted as a push factor on the supply side.

to combine several poorly paid part time service jobs ('McJobs') with working on their own account (Beck, 2000, pp. 2, 55). This labor market development in developed economies resembles the 'patchwork quilt' of labor in many semi-industrialized countries (Beck, 2000). It is the 'Brazilianization of the West' — a 'reversal to pre-modernity'. Society is reverting to its historic norm with individuals engaged in many activities, informal labor relations and self-employment. In retrospect careers and lifetime jobs are a twentieth century exception. While some of Beck's views may be an exaggeration, the analysis resonates.

Additionally, since the 1990s, many OECD governments have implemented policies designed to stimulate self-employment. These measures include tax breaks for the self-employed, labor market deregulation, deregulation of entry, and privatization of many hitherto (semi-) public sectors.

4.2.2 Supply Side

Factors stimulating the *supply* of self-employment came to the fore after 1980. Among these, demographic factors are prominent. Between roughly 1980 and 2020, the post World War II baby boom generation in many postindustrial economies is passing through the 35–55 years age group; the age at which individuals are most likely to be self-employed. In addition, in highly developed economies there is a large increase in dual income households able to reduce entrepreneurial risk by combining a wage job for one with (solo) self-employment for the other.

Older individuals are also increasingly likely to engage in self-employment. In the US, for example,[2] older workers 'are staying in the labor force longer than prior trends would have predicted and many change jobs later in life' (Giandrea et al., 2008, p. 2). A longitudinal study following a cohort of 5,570 US respondents between 51 and 63 years of age in 1992 and with 'full-time career jobs' returned 12 years later, in 2004, to find that of the almost 50% still working, more than 25% were self-employed compared to 16% being self-employed in 1992. This increase in self-employment later in life is 'a result of a combination of factors, including the fact that self-employed workers tend to

[2] This is probably the case in many other OECD countries as well.

stay in the labor force longer than wage-and-salary workers and that more wage-and-salary workers switch into self-employment later in life than vice versa' (Giandrea et al., 2008, p. 17). Singh and De Noble (2003) present a typology of 'early-retiree self-employment'. 'Constrained entrepreneurs' have relatively high entrepreneurial tendencies, but because of various established or perceived constraints 'have been unable to act on such tendencies earlier in their careers' (Singh and De Noble, 2003, p. 217). 'Rational entrepreneurs' decide on self-employed after comparing their current position with self-employment. Often financial returns play a major role in the assessment. 'Reluctant entrepreneurs' lack 'employment opportunities in the primary labor market' (Singh and De Noble, 2003, pp. 218–219).

As the vanguard of the baby boom generation is reaching retirement age, whether early or traditional, with good health combining with their human, social, and financial capital, but not always with adequate retirement income, it seems a safe prediction that solo self-employment in the 55+ age group, including those 65 and older, will continue to increase.

4.2.3 Necessity versus Opportunity Entrepreneurship

Recently, the various observations and assumptions discussed under the headings of demand and supply side, are to some extent corroborated by the self-expressed motives of early-stage entrepreneurs to choose for self-employment. Global Entrepreneurship Monitor 2007 survey research (Bosma et al., 2008) shows that even in relatively affluent OECD countries, on average almost 40% of early-stage entrepreneurs do not choose self-employment out of 'improvement-driven opportunity recognition'. Rather, they opt for self-employment either out of necessity (because they have no better options for work), to maintain their income, or for mixed motives (necessity and opportunity). In less developed countries more than 50% of the entrepreneurs have non-opportunity or mixed motives for choosing for self-employment. Accordingly, using GEM 2004 entrepreneurship data, Acs (2006) finds a positive relationship between the opportunity-necessity entrepreneurship ratio and a country's per capita income. Opportunity motives for

self-employment are thus at least partly and positively linked to economic development levels. A growing need for independence plays a prominent role in this relationship. In OECD countries around 35% of early-stage entrepreneurs choose self-employment in order to gain independence, while in less developed countries 'being independent' is the primary motive for only around 20% of early-stage entrepreneurs (Hessels et al., 2008).

Other authors also evaluate the prevalence of 'self-employment out of necessity' in developed economies (Boyle, 1994; Singh and De Noble, 2003; Hughes, 2006). While the evidence is often sketchy and sometimes anecdotal, it is likely that in most OECD countries necessity entrepreneurship, which is also known as 'reluctant', 'refugee' or 'involuntary' self-employment, makes up a non-negligible minority group within the self-employed.

4.2.4 Spurious (quasi) versus Real Self-employment

The solo self-employed harbor an unknown number of 'spurious' or 'quasi' self-employed, also known as 'grey' or 'dependent' self-employed, who are rather similar to wage-earners. Since the 1980s, a growing number of publications in the sociological and the economic literature compare these 'quasi' self-employed workers with 'real' self-employed on the one hand and with employees on the other (Boyle, 1994; Granger et al., 1995; Belussi, 1998; Jaspers, 1999; Beck, 2000; Muehlberger and Pasqua, 2006; Boegenhold and Fachinger, 2007; Kautonen et al., 2009). From this literature it appears that in many highly developed countries there is a growing 'grey area' between self-employment and wage employment.

Based on this literature,[3] both legal and economic criteria play a role in distinguishing between real and quasi self-employed. Legal perspectives evaluate whether an individual carries out paid activities under a commercial contract to deliver services or earns wages. Related to this is the formal status of a 'self-employed worker' with tax and social security authorities. Economic criteria are many, and they are also less

[3] Kautonen et al. (2009) is particularly helpful in this respect.

clear-cut. These include the:

— degree of autonomy in carrying out the agreed work;
— degree of integration in the client's organization; and
— formal and informal freedom to work for others

These criteria focus on the degree of autonomy or independence with which paid activities are carried out. Two other economic criteria refer to the content and scope of activities including:

— doing the same or different work as the principal's employees; and
— the degree to which typical entrepreneurial activities are carried out, such as marketing, acquisition and recombining factors of production.

Complicating empirical analysis is that usage of the various criteria does not allow for a clear-cut distinction between real and quasi self-employment. While empirical research regarding the prevalence of quasi self-employment is scarce, it appears that only a small percentage of the solo self-employed meet all the criteria that would fully qualify them as 'employees in disguise'. Nevertheless, self-employment is probably a matter of degree, and this aspect contributes to the 'grey area' between self-employment and wage employment.[4]

4.2.5 A Double Dichotomy of Solo Self-employment

When we combine both dimensions — real versus quasi (spurious) self-employment and voluntary versus involuntary (necessity) self-employment — we obtain the following double dichotomy for types of solo self-employment (see Table 4.1).

Statistical data for each category is scarce. A survey of 403 solo self-employed in Finland (Kautonen et al., 2009) finds that substantial numbers show some aspects of quasi self-employment and/or self-reported involuntariness. However, according to this study only two

[4] Another complication is the relatively large incidence of part-time self-employment, which may not only be a source of secondary income 'but also a first step into full-time self-employment' (Wennberg et al., 2006, p. 1).

Table 4.1. Double dichotomy of solo self-employed.

	Voluntary self-employed	Involuntary self-employed
Real self-employed	— Fully autonomous — Following own preference	— No other choice to earn a living (out of necessity)
Quasi self-employed	— Voluntary arrangement with previous employer or exclusive client	— No other choice offered by previous employer or exclusive client

respondents completely fulfill the criteria of quasi self-employment and, at the same time, consider their entry into self-employment to have been involuntary.[5] Our best guess is that in post-industrial economies voluntary real self-employed are by far the largest group, but that a non-negligible number of solo self-employed show some aspects of 'quasi self-employment' or of 'involuntariness'.

4.2.6 Conclusion

We consider three basic labor market categories: employers, solo self-employed and wage-earners. Due to fundamental push and pull factors in the labor market, the solo self-employed are the fastest growing category in post-industrial economies, and they make up a large share of the rise of independent entrepreneurship. Additionally, an unknown, but non-negligible, number of the solo self-employed are 'reluctant' to be self-employed or show characteristics that make them 'employees in disguise'.

4.3 A Changing Relationship Between Entrepreneurship and Innovation

4.3.1 New Technologies and Entrepreneurial Opportunities

While the labor market's push and pull factors play a major role in explaining the revival of entrepreneurship, these share the stage with highly forceful and often disruptive new technological developments. In particular, the ICT revolution not only lowers transaction costs[6]

[5] The incidence of involuntary quasi self-employment is probably higher in specific occupations such as hairdressers, lorry drivers and home-care helpers.

[6] In addition to lowering external transaction costs, ICT also lowers coordination and communication costs within corporations (Varian, 2002). We assess that presently the effect

and advances network economies, but it also leads to the proliferation of new Internet-based business models designed to reach large numbers of customers at low costs. ICT in concert with other new technologies, such as biotech and nanotech, are changing the underlying parameters of the relationship between entrepreneurship and innovation. As previously noted, this new industrial revolution can be interpreted as a reversion back from a Schumpeter Mark II regime in which large business dominate innovation, to a Schumpeter Mark I regime in which independent entrepreneurs are the major agents of change (see Carree et al., 2002). This regime switch also reflects that '. . . the economic and social environment actually changed in such a way as to shift the innovative advantage more towards smaller enterprises' (Acs and Audretsch, 2005, p. 185). It is also '. . . what one would expect, in as much as the arrival of any major, new technology should favor young, small firms'.[7] There are even indications that innovations by young and small firms dominate in the trough of the business cycle (Koellinger and Thurik, 2009).

Technological change may be the most significant determinant of expanded entrepreneurial opportunities in the late twentieth and early twenty-first century. In all eras new technological knowledge embodies the potential for new goods and services, something certainly still true. However, incumbent organizations, such as universities and large enterprises whose R&D activities produce new knowledge, do not automatically exploit the implied economic opportunities. This 'gap' may be caused by the inherent uncertainty with respect to the expected value of the new knowledge, by information asymmetries and/or other divergences between the researcher possessing the knowledge and the decision-making hierarchy of the incumbent organization, or by an inconsistency between the new idea and the core competence of the incumbent organization (Acs and Varga, 2005; Audretsch and Keilbach, 2006; Acs et al., 2009). These imperfections are a major source of entrepreneurial opportunities for innovative new business

on external transaction costs, causing a wave of outsourcing and new business start-ups, is the larger one. In future years, when the new technologies mature, the balance may be different.

[7] This quote from (Jovanovic, 2001, p. 54) refers to the arrival of the microprocessor, but obviously has wider applicability.

start-ups, and may stimulate agents possessing new knowledge to start a new firm in an attempt to appropriate the new knowledge.[8] Such start-ups potentially belong to the small but essential domain of *high impact entrepreneurship* in the sense of '... the actions of individuals responding to market opportunities by bringing inventions to market that create wealth and growth.' (Acs, 2008, p. 537).

4.3.2 A New Industrial Revolution

In retrospect, the last 25 years of the twentieth century may be viewed as the onset of the Third Industrial Revolution (Jensen, 1993), and now the benefits from its inventions are becoming clear. Industrial Revolutions are periods of creative destruction. New industries like ICT, biotech, and nanotech emerged, provoking considerable new venture entry. Although many fail, others quickly become important business players. Acs and Audretsch (1987) show that small firms have a relative innovative advantage over their larger counterparts in the highly innovative industries. Both Prusa and Schmitz (1991) and Baumol (2002) show a comparative advantage for small firms in inventing radically new products. Additionally, start-ups are more likely to commercialize university inventions than incumbents (Van Praag and Versloot, 2007). In other words, the time of the admired inventors/entrepreneurs of the late nineteenth and early twentieth centuries appears back again. Names like Bell, Carnegie, Edison and Ford have modern equivalents in Branson, Dell, Gates and Jobs. Being an entrepreneur is again a highly valued occupational choice in many countries around the world. In many European countries it is no longer the sole ideal of ambitious university graduates to get a job as a civil servant or as a manager with a large multinational company. Students are now interested in establishing companies of their own, and many universities focus on entrepreneurship.

At the aggregate level of industries, countries, and regions the individual attempts of economic agents trying to commercialize new

[8] In this way, entrepreneurship serves as a conduit for knowledge spillovers. The knowledge spills over from the source (i.e., the agent holding the knowledge) to a new firm in which it is commercialized (Audretsch and Keilbach, 2004).

knowledge create a mosaic of new experiments (Wennekers and Thurik, 1999, p. 50). In evolutionary terms this is called 'variety'. A continual competition between these new ideas and initiatives leads to the selection of the most viable firms and industries.[9] Variety, competition, selection, and imitation expand and transform both regional and national productive potential. Obsolete firms are replaced or displaced by expansion of new niches and industries. Furthermore, there are important feedback mechanisms. Competition and selection amidst variety[10] undoubtedly enable individuals and firms to learn from their own and others' successes and failures. These learning processes enable individuals to increase their skills and adapt their attitudes through active learning. The outcome of these so-called spillovers will be new entrepreneurial ventures (Carree and Thurik, 2003).

4.3.3 Empirical Evidence

As explained in Section 3.3 highly advanced economies seem to be moving from an *investment-driven stage* of economic development dominated by the technical progress generated by large corporations to an *innovation-driven stage* where small and new enterprises have a growing role in innovation and challenge incumbent firms by introducing new inventions. As noted before, this can be seen as a regime shift from Schumpeter Mark II back to Schumpeter Mark I. To further explore this hypothesis we regress GEM's 2007 Total early-stage Entrepreneurial Activity (TEA) index on the innovative capacity index constructed by the World Economic Forum (WEF, 2007)[11] as an alternative measure for the subsequent stages of economic development. The results, as seen in Table 4.2, are significant for both the linear and the squared term of the innovation index, confirming earlier results by Wennekers et al. (2005) regarding the relationship between nascent entrepreneurial

[9] Jovanovic (1982) characterizes this process as noisy selection. Efficient firms grow and survive while inefficient firms decline and fail. This selection process is characterized by high levels of business dynamics — entry and exit of firms — in markets.

[10] For the important role of competition and variety at the local urban level see Glaeser et al. (1992).

[11] In particular, we use the 12th pillar of the so-called Global Competitiveness Index (WEF, 2007, p. 20).

Table 4.2. Relating total early-stage entrepreneurial activity (2007) to the level of economic development as measured by innovative capacity.

	U-shaped relationship with innovative capacity
Constant	57.4***
	(3.0)
GCR Innovation Index	−21.2**
	(2.2)
GCR Innovation Index, squared	2.15*
	(1.9)
Adjusted R^2	0.232
Observations	42

Absolute t-values in parentheses.
***Significant at 0.01 level; **significant at 0.05 level; *significant at 0.10 level.

activity and innovative capacity in 2002. We thus conclude that a U-shaped relationship between the rate of early-stage entrepreneurial activity and a country's innovative capacity seems stable across 2002 and 2007.

Additionally, Koellinger (2008) finds evidence of a positive relationship between economic development and innovative entrepreneurship. In this study, a multi-level logit model is estimated, using pooled micro-data 2002–2004 for about 6,500 nascent entrepreneurs from 30 countries as well as aggregate country data in order to explain the prevalence of self-perceived innovative nascent entrepreneurs within this sample. The operationalization of the latter is chosen with the goal of differentiating between purely imitative business ideas and those with some degree of novelty at least at the local market level. First, a significant positive influence on the prevalence of innovative entrepreneurship exists with respect to, among others, tertiary education, entrepreneurial self-confidence, and opportunity perception at the individual level. Second, the regression analysis shows that GDP per capita in the respondent's country of residence has a significant positive influence on the odds of innovation among nascent entrepreneurs (Koellinger, 2008, p. 32). The finding that the individual probability to exploit an innovative business idea rather than a purely imitative one is greater in more advanced economies may be related to the fact that these countries operate closer to the worldwide production-possibility frontier (PPF) thus offering a more constrained scope for imitation (Koellinger, 2008, pp. 27, 34).

4.3.4 Other Indicators of Ambitious Entrepreneurship

If it is true that university graduates in highly developed economies no longer solely desire a job with a large organization, but instead want to establish companies of their own, there should also be empirical evidence of an increasing rate of 'ambitious entrepreneurship' at the higher end of economic development. A good proxy for ambition may be the degree of export-oriented new entrepreneurship. And indeed, across an unbalanced panel of more than 50 countries in 2006 and 2007, Terjesen and Hessels (2009) find a significant positive relationship between measures of export-orientated early-stage entrepreneurship and the level of per capita income.

Another proxy for ambition is the degree of high-growth expectation entrepreneurial activity (HEA), as assembled by GEM (Bosma et al., 2008). In a regression analysis between HEA and per capita income, a U-shaped relationship across 33 countries (including China) and a positive linear one across 32 countries (excluding China) is found. Table 4.3 reports the findings. In fact, among the 21 richest countries in this database, the relationship between HEA and per capita income is more positively sloped and highly significant. Figure 4.1 shows the results for the latter two regressions.

Table 4.3. Relating high-growth expectation early-stage entrepreneurship (average 2000–2006) to the level of economic development, as measured by per capita income.

	U-shaped relationship with per capita income (I)	U-shaped relationship with per capita income, excluding China (II)	Linear relationship with per capita income, excluding China (III)	Linear relationship with per capita income, 21 richest countries (IV)
Constant	0.98***	0.66**	0.33*	−1.2**
	(3.0)	(2.1)	(1.9)	(2.4)
Per capita income	−0.041	−0.022	0.010*	0.049***
	(1.5)	(0.9)	(1.9)	(3.8)
Per capita income, squared	0.00088*	0.00060		
	(1.7)	(1.3)		
Adjusted R^2	0.053	0.097	0.076	0.397
Observations	33	32	32	21

Absolute t-values in parentheses.
***Significant at 0.01 level; **significant at 0.05 level; *Significant at 0.10 level.

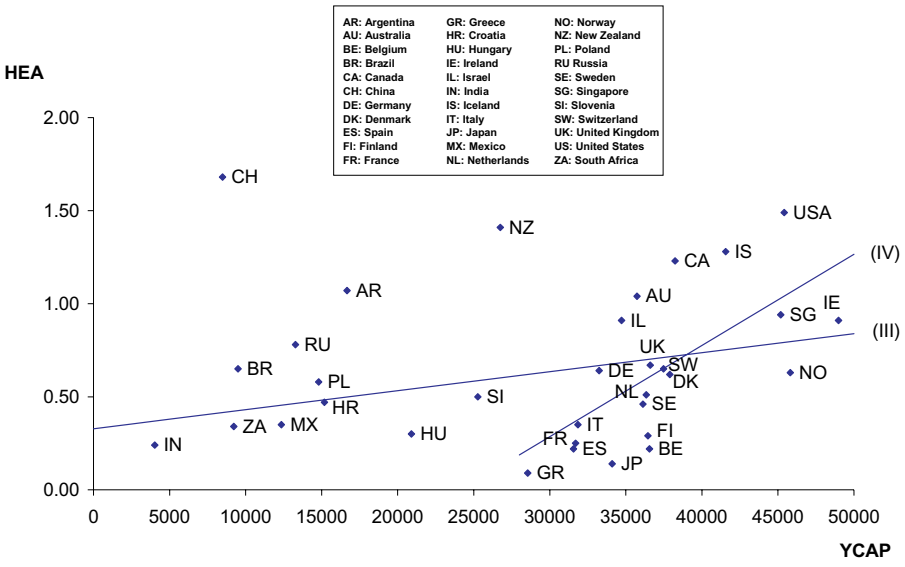

Fig. 4.1 HEA index versus per capita income, linear specifications (III) and (IV) of Table 4.3.

Obviously, these regressions do not imply causality between these variables, which may even be absent or run in either direction.[12] This is a subject for further research. Nonetheless, the highly significant positive relationship between the level of per capita income and the rate of high-growth expectations early-stage entrepreneurship is intriguing and may exemplify a new stylized fact.[13] For the time being,

[12] In a general sense, the existence of two-way causality is confirmed by Thurik et al. (2008) who find two distinct relationships between unemployment and self-employment. More specifically, in a multiple regression analysis using data for 37 countries, Wong et al. (2005) find a positive effect of ambitious early-stage entrepreneurship on economic growth rates but no effect of overall early-stage entrepreneurship. In addition, Stam et al. (2009) find that the positive effect of ambitious entrepreneurship on GDP growth is larger for highly developed and transition economies than for developing economies. Combining these results with the stylized facts in Table 4.3 suggests that, above a certain income threshold, ambitious entrepreneurship and economic development may create a virtuous circle.

[13] Van Praag and van Stel (2010) provide indirect empirical evidence, related to their finding of a negative relationship between the optimal rate of overall business ownership and the enrollment rate in tertiary education. The reasoning is as follows. First, a higher rate of high-growth entrepreneurs leaves less room in the economy for smaller firms, given the total labor supply. Hence, high-growth entrepreneurship and overall business

we interpret these findings as supporting the theory that advanced economies are experiencing a reversion from a Schumpeter Mark II regime to a Schumpeter Mark I regime.

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ownership are negatively related. Second, since participation in tertiary education is positively related to economic development, it follows that a negative relationship between overall business ownership and tertiary education is consistent with a positive relationship between economic development and high-growth entrepreneurship.

5

Conclusions and Policy Implications

5.1 Conclusions

This survey reviews the evidence for a U-shaped relationship between the level of economic development and the rate of 'occupational entrepreneurship', also known as independent entrepreneurship, self-employment or business ownership. In addition to the *level* of occupational entrepreneurship, we also consider *gross entry* into entrepreneurship and a related measure called 'early-stage entrepreneurial activity'. Behavioral entrepreneurship is taken into account in as far as it overlaps with occupational entrepreneurship.

Following a long, steady decline of the rate of independent entrepreneurship since at least the early nineteenth century, a discontinuity in the trend over recent decades is well documented. Starting in the 1970s Anglo-Saxon countries experienced a reversal in the trend, while several countries on the European continent followed in the 1980s. Business ownership rates in Australia, the United Kingdom, and the United States have stabilized since the late 1990s, but rates in Germany, the Netherlands and some other European economies remain increasing. Weighing the evidence, it is too early to conclude that the historical, decreasing relationship between economic development and

the *level* of business ownership has become U-shaped. Nonetheless, a trend break is beyond doubt, and this discontinuity is all the more remarkable as there is no convincing conceptual *a priori* reason why independent entrepreneurship should not continue decreasing. It is conceivable that, ultimately, large internet stores, chain stores and other multi-establishment corporations would prevail because they can reap economies of scale, reduce transaction costs, and at the same time offer a fine-maze network of distribution reaching their customers. However, powerful new driving forces are at the fore since the 1970s. These include the rapidly growing services sector with its smaller scale and lower entry barriers, an increasing differentiation of consumer preferences, declining transactions costs, and increasing network economies related to information technology, and last but not least a trend in occupational preferences toward more autonomy and self-realization. Additionally, globalization in concert with evolving ICT enables solo entrepreneurs and small firms to profit from scale economies through loosely organized networks. Some of these forces, including a differentiation of consumer preferences and an occupational preference for more autonomy, are relevant for countries with an advanced level of economic development, while the diffusion of new information and communication technologies seem relevant for all nations irrespective of their per capita income.

Early-stage entrepreneurial activity may be an even more important measure of entrepreneurship, because it notably combines aspects of occupational and behavioral entrepreneurship. Although there are no long time series for any measure of gross entry, cross-sectional analysis for recent years shows a significant U-shaped relationship between early-stage entrepreneurial activity and levels of economic development. Two 'revolutions' seem to be underlying the upward trend of the U-shaped curve for early-stage entrepreneurial activity. If we distinguish between solo self-employed at the lower end of the entrepreneurship spectrum, and ambitious and/or innovative entrepreneurs at the upper end, we see discontinuities at both ends. In sheer numbers the growing entry of new solo self-employed without employees appears dominant. This trend has strong implications for the labor market and for the external organization of the business sector. In qualitative

terms, however, the apparent positive correlation between ambitious and/or innovative business start-ups and average per capita income may be more important. This stylized fact represents the onset of an innovation-driven stage of economic development while marking a regime switch in the relationship between entrepreneurship and innovation. In addition, the correlation between ambitious and/or innovative entrepreneurship and economic development probably masks bidirectional causality.

5.2 Policy Implications

Meanwhile 'the entrepreneurial idea has gone mainstream, supported by political leaders on the left as well as on the right' (The Economist, 2009, p. 3), and accordingly entrepreneurship has become a key policy issue worldwide. However, entrepreneurship is a fuzzy concept, and as long as we do not properly define the typologies and phenomena involved in entrepreneurship, many implications for policy are likely to be on shaky grounds. In particular, policymakers in advanced economies should be aware of the two revolutions discussed before. The rise of solo self-employment is important because it increases the flexibility and productivity of the economic system, while contributing to a higher degree of job satisfaction. On the downside this trend toward more self-employment also increases insecurity for those involved as well as income inequality. The upward trend of innovative and/or ambitious entrepreneurship at the high end of economic development is of particular interest for competitiveness, economic growth and job creation.

What do our findings mean for policymakers? Only a few policy measures seem universally applicable. First, more extensive and effective entrepreneurship education seems sensible for promoting all sorts of entrepreneurship (Hessels et al., 2009). Secondly, and particularly in Europe, measures to lower the 'opportunity costs' of self-employment, including the introduction of a more individualized pension system, would make up another no-regret policy.

At the high end of entrepreneurship, governments can specifically stimulate ambitious, innovative start-ups by facilitating the commercial exploitation of scientific discoveries. This includes encouraging

universities to establish science parks, technology offices, business incubators and venture funds. Particularly in Europe, a further deregulation of the labor market for well-paid managers and professionals will be helpful in removing disincentives discouraging prospective ambitious entrepreneurs 'from leaving their tenured jobs and undertaking the risks in creating new enterprises' (Baumol, 2008, p. 13). In addition, a more flexible labor market will lower the risks of hiring employees and will be conducive to the evolution of high growth businesses (Henrekson et al., 2010, p. 16).[1]

At the lower end of entrepreneurship, in many advanced economies the rise of solo self-employment does not seem to ask for any more specific fiscal incentives, but it may need to be accommodated through adequate social policies. Here the goal should be 'to find the right balance between flexibility and security' (The Economist, 2009, p. 18).

5.3 Future Perspectives

ICT does not only provide lower transaction costs enabling a more extensive division of labor and promoting small business start-ups, it also helps to lower internal communication and coordination costs within large multinational corporations. At present the former effect promoting small firms seems dominant, but in the future the latter effect may gain momentum. Specifically, in a later, more advanced phase of the present 'Industrial ICT Revolution' many experimental new products, production processes and business models will give way to dominant designs. Scale economies and process innovations will again become prominent in the quest for productivity gains, and this may favor larger firms. So in the longer run the upward trend of innovative new business start-ups may level off or even reverse. However, as usual, that remains to be seen.

[1] See Bosma and Levie (2010, p. 27) for empirical evidence on the (negative) relationship between the strictness of employment protection and the prevalence of high-expectation early-stage entrepreneurship, and Van Stel et al. (2007) for empirical evidence on the (negative) relationship between the rigidity of labor market regulations and overall early-stage entrepreneurship.

A

Appendix: Specification of the Carree et al. Model

The model of Carree et al. (2002, 2007) describes the interrelationship between business ownership and economic development at the country level. It consists of three equations. The first equation explains changes in the rate of business ownership from an error-correction process toward 'equilibrium' rates. The second equation determines the growth penalty of the rate of business ownership being 'out-of-equilibrium'. A third equation acts as a definition and describes the 'equilibrium' rate of business ownership as a function of economic development. It reads as follows:

$$\begin{aligned}\Delta_4 E_{it} &= b_1(E^*_{i,t-4} - E_{i,t-4}) + b_2(U_{i,t-6} - \overline{U}) \\ &\quad + b_3(LIQ_{i,t-6} - \overline{LIQ}) + b_{ITA} D_{ITA} + \varepsilon_{1it}; \qquad \text{(A.1)} \\ \frac{\Delta_4 YCAP_{it}}{YCAP_{i,t-4}} &= c_0 + c_1 |E^*_{i,t-4} - E_{i,t-4}| + c_2\, YCAP_{i,t-4} + \varepsilon_{2it}; \qquad \text{(A.2)} \\ E^*_{it} &= \alpha + \beta\, YCAP_{it} + \gamma\, YCAP^2_{it}; \qquad \text{(A.3)} \\ E^*_{it} &= \alpha - \beta \frac{YCAP_{it}}{YCAP_{it} + 1}, \qquad \text{(A.4)}\end{aligned}$$

where

E:	is the number of business owners per labor force,
E^*:	'equilibrium' number of business owners per labor force,
$YCAP$:	per capita GDP in thousands of purchasing power parities per US $ in 1990 prices,
U, $\overline{U}$:	unemployment rate and sample average, respectively,
LIQ, $\overline{LIQ}$:	labor income share and sample average, respectively,
D_{ITA}:	dummy variable with value 1 for Italy, and 0 for other countries,
$\varepsilon_1, \varepsilon_2$:	uncorrelated disturbance terms of Equations (A.1) and (A.2), respectively,
i, t:	indices for country and year, respectively

and where Δ_4 denotes a four year difference: $\Delta_4 X_t = X_t - X_{t-4}$. Obviously, Equation (A.3) is used to describe the U-shaped relationship and Equation (A.4) the L-shaped one. The term 'equilibrium' is not meant to suggest that the relationship between number of business owners and per capita GDP is formally derived. See Thurik et al. (2008) for some indications of the many and complex short-term interrelationships between business ownership and unemployment.

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