The Relation between Enterprise Population Dynamics and Economic Cycle

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Abstract

In 2009 in Poland we could observe the effects of global financial crisis translating into an economic slump. Poland, however, was the only European country to achieve positive economic growth. GDP dynamics in our country dropped to the level of 1,8%, inflation rate fell to 3,5% in 2009, and the unemployment rate rose to 11,9%. Demographic rates as basic indicators of enterprise population growth dynamics serve as a measure that is ahead of changes in economic cycle. This is due to their dependence on changes in macroeconomic factors (GDP, Inflation, Unemployment). For European countries the strongest correlation was recorded for the 'death' rate and unemployment rate in 2005 (i.e. with an anticipation effect) and the unemployment rate in 2007 and enterprise population dynamics (defined as: difference between 'birth' rate and 'death' rate). A significant interdependence was identified between the birth rate and real GDP from 2007 i.e. without an anticipation effect or delay. GDP growth stimulates establishing new business entities. The relationship between demographic rates for enterprise population and inflation is the strongest for enterprise dynamics (difference between the birth rate and death rate) and the inflation rate from 2005. However, this interdependence is weaker than in previous cases. For Poland a direct interrelationship between enterprise population dynamics and the unemployment level cannot be identified for certain. A more salient negative interdependence may be noticed between unemployment and enterprise retention measured by a total of birth and death rates. High unemployment, in turn, might encourage entrepreneurs to set up new companies. After a period of high unemployment labour market absorbs self-employed people leading to an increased enterprise retention and a decline in unemployment in the subsequent years. Those findings confirm Schumpeter's theory of creative destruction. Enterprise population dynamics is significantly dependent of GDP value. The evaluation of long-term interdependences at macroeconomic level is impeded due to a short observation period. Neither do the results for other countries confirm relationships between basic macroeconomic and measures and demographic indicators.

Key words: business demography, enterprises' population dynamics, relation to macroeconomic indicators, business cycle

1. Introduction

In 2009 in Poland we could observe the effects of global financial crisis translating into an economic slump. Poland, however, was the only European country to achieve positive economic growth. GDP dynamics dropped to the level of 1,8%. Inflation rate fell to 3,5% in 2009, whereas the unemployment rate rose to 11,9%. At present, both experts and entrepreneurs announce a temporary recovery or even the end of economic crisis in Poland.[1] However, those profound market changes led to a substantial variation in the dynamics of enterprise population growth. The influence of changes in economy brought about by the crisis on an enterprise operations should be the core element of business management. Population dynamics as measured by demographic indicators specified by 'business demography' is a useful tool to define economic changes and their effects on the enterprise market.

The influence of economic conditions on small enterprises entering and exiting the market can be considered in terms of macro and microeconomic factors. Data interpretation shall allow for the complexity of issue and the effects of multiple factors acting simultaneously. Therefore, multilevel models have to be applied. Some conclusions may be drawn with regard to a relationship between factors determining market entries, 'birth' rates and economic situation. There was a negative relationship (correlation coefficient -0,44) between the 'birth' rate and GDP as a measure of economic growth[2] for 19 European Union countries.

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[1] Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2008-2009, PARP, Warszawa 2010.
[2] Business demography in Europe. Enterprise publications. Observatory of European SMEs 2002/No 5. European Commission 2002.

A positive correlation, though not so strong, could be found between the unemployment and 'birth' rate, which stems from the fact that in the case of high unemployment jobless people are strongly motivated to find employment by setting up own business. In such conditions so-called 'push' factors come to play. Nevertheless, neither relationship is confirmed by ample evidence to indicate its importance. The Eurostat report dating back to 2004 refuted the hypothesis that the high unemployment rate is likely to stimulate people to set up their own business. Conversely, high unemployment was the evidence of weak economy. The report confirmed that there is a relationship between the number of newly emerged enterprises and GDP. High economic growth is conducive to starting new businesses[3]. In fact, some researchers maintain that there is a strong relationship between enterprise population dynamics and economic growth in Poland[4]. The strong correlation was also confirmed in Ireland, Portugal and Great Britain. In Belgium a negative relationship between enterprise population dynamics and economic growth was noted, whereas in Italy and Austria a lack of such relation was revealed[5].

A thorough analysis of how this trend will develop in the course of time would allow to justify the abovementioned conclusions.

2. *Schumpeter's theory of innovations*

The basis of this theory are innovations (Noga 2009). The existence of the enterprise, its borders are established by maximization of profits from innovations. Enterprise implement innovations by new products and business solutions. The market is seen as enterprise by itself as initiatives of entrepreneurs. The borders of enterprise are rather soft. Those borders by biurocracy kill entrepreneurships and innovations. The basic goal is profit and innovations. Enterprise creates new markets being partly monopolist due to direct innovations. Both successes and failures are good for the economy. Failed innovations are the cost of successive innovations driving economic growth. Big part of innovative enterprises drive economic growth (in Poland there is too few of such enterprises). The crucial in the enterprise is entrepreneur treated as the owner (manager). Ideas of the entrepreneur and feedback from the customers decide about the success and enterprise's survival. Schumpeter's theory may be included in analysis of relationships between macroeconomic and entrepreneur's behavior on the micro level. Schumpeter's theory shows how enterprises and entrepreneurs may influence the economic growth. Enterprises are treated as investments which pull investments of other entities. Investments cause savings and increased supply, difficulties with sales which may finally drive to economic crises. New investments break the crises and push the economy to growth. Schumpeter's theory is treated as supply theory of innovations which is popular theory of economic cycle. The connection of this theory with enterprise's life cycle and business demography is obvious. Only enterprises that create economic growth will survive. Creative development requires creative destruction. Crises is the way of enterprises' life cycles regulation. Too many enterprises do not create effective allocation of resources.

Among popular economic theories, Schumpeter's theory of creative destruction (described above) is frequently cited in business demography (Scarpetta, Bassanini, Pilat, Schreyer, 2000) in the context of enterprises' life cycle. Creation of new enterprises and closure of existing are key elements of global dynamics of the economy. Reallocation of assets from low productivity sectors (companies) to highly effective by creating new enterprises and elimination of ineffective enterprises is main idea of this economic theory. Reallocation induce pressure on existing enterprises causing them to increasing competitiveness due to keep their position on the market. Weaker companies in the process of natural selection are eliminated and give new place for new more effective enterprises. This starts the process of self-education of enterprises and shapes their life cycle (Jovanovic 1982). To minimalize the risk of uncertainty due to lack of information at start, enterprises try to start up as small entities minimalizing costs of failure. If the situation on the market comes positive enterprises grows, or exit the market in case of negative situation. Enterprise may influence its profits not only by observation but also making some actions increasing it's sales and profits (Ericsson, Pakes, 1995). Theories of this kind were verified empirically. The „U" shape of hazard rate confirm this process of self-education.

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[3] Business demography in Europe. Results for 10 Member States and Norway. Data 1997-2001. „Statistics in Focus" European Commission. Eurostat 2004

[4] P., Szymański. Statystyczny obraz narodzin i zgonów przedsiębiorstw. In: Mączyńska E. (ed.), Bankructwa przedsiębiorstw. Wybrane aspekty instytucjonalne, SGH, Warszawa 2008 pp. 263 and further.

[5] Business demography in Europe. Enterprise publications. Observatory of European SMEs 2002/No 5. European Commission 2002.

New enterprises need time to assess it's own effectiveness. This behavior is known as „liability of the adolescence" against to „liability of the newness" (Bruderl, Schussler, 1990 oraz Fichman, Levinthal, 1998). „Churn" ratio according to Schumpeter's theory is a measure of turbulences on the market. This ratio is considered as ability of the market to adoption of the production structure to changing market requirements. In the case of highly competitive economies birth rate and death rate is rather high in a given period (Nunes, Sarmento 2010). Economies with majority of small and micro enterprises are characterized by high level of „churn" ratio. High level of his ratio indicates high ability of enterprises to adopt to changing market conditions.

3. *Poland against Europe*

The difference between the 'birth' rate and 'death' rate serves as a measure of changes in enterprise population dynamics (in accordance with Eurostat methodology).

In 2007 a negative difference between the 'birth' rate and 'death' rate was recorded in the case of 5 out of 23 European countries (see figure 1) for which data was available (excluding Poland). For Poland this figure was 4,29%. Due to limited availability of Central Statistical Office data these are just estimates that account for the share of active entities and are based on small enterprises data exclusively. These organisations, however, make up over 96% of all registered and active economic entities, thus the rate value is skewed in a small degree. Data on newly registered and deregistered entities in a given year come from REGON statistics. In accordance with Eurostat classification it covers only non-financial enterprises for the following sectors: industry and services, excluding public administration and holding management (NACE Code C to K excluding 74.15). In the case of such countries as Slovakia, Portugal, Hungary, Germany and the Czech Republic, more deregistered enterprises than those newly started (registered) fell on 100 active business units. The greatest prevalence of the registered entities over those that were deleted from the register calculated for 100 active enterprises was observed in Estonia and Latvia. Poland, with the rate of 4,29, was ranked as 7th among countries that provided data. Substantial positive difference between the 'birth' rate and 'death' rate indicates great enterprise population dynamics, even though in many cases the assessment is hindered due to some lack of comparability between presented statistical data. Data referring to given countries vary both in terms of 'birth' or 'death' definitions and the definition of active unit. Statistics may include units with at least one employee or self-employment. A unit may be defined as an entity or entity with its local units[6].

In 2006 within the OECD programme (commissioned by Consortium for Dynamic Entrepreneurship Benchmarking from Denmark) a report[7] that analyses in detail the reasons for discrepancies in presented data in the field of business demography was issued. This extensive material verifies data sources pointing to the usefulness of registers. The report discusses factors that have an influence on both a numerator and denominator of reported demographic ratios. The author presents analytical tools that allow to correct presented figures and at the same time ensure comparability between countries.

Despite some problems with data presentation which skew the results, enterprise population dynamics in Poland is at a good level (situation improvement in comparison to the year 2006 can be noticed, see A. Ptak-Chmielewska 2010). In 2009 enterprise population dynamics virtually dropped to zero but since 2010 a gradual improvement has been recorded. Assuming 2009 was the effect of regulatory changes (change in PKD, Polish Classification of Activities), we have seen a systematic improvement in enterprise population dynamics since 2007. The greatest dynamics is characteristic of a group of small (micro in particular) and medium enterprises.[8] The number of newly set up companies was higher than this of companies that went out of business only in the case of micro and small enterprises. As for big and medium enterprises, a reverse phenomenon was noticed. An increase in active enterprises (micro and small in particular) that is not accompanied by a rise in registered micro and small businesses indicates the influence of changes in PKD (Polish Classification of Activities) in 2007 as well as the effects of REGON system update. A drop in enterprise dynamics could be treated as a signal of upcoming recession on the market.

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[6] Business demography in Europe. Enterprise publications. Observatory of European SMEs 2002/No 5. European Commission 2002, pp. 16 and further.

[7] S. Vale, The international comparability of Business Start-up Rates Final Report. OECD Statistics Working Papers nr 4/2006.

[8] Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2008-2009, PARP, Warszawa 2010, pp. 31-38.

According to the new Eurostat/OECD programme regulations – Entrepreneurship Indicators Programme (OECD 2008) – next to enterprise 'birth' rates, 'death' rates and 'survival' rates there are also 'churn' rates defined as a total of enterprise 'birth' rates and 'death' rates. This measure represents the vulnerability of economy to dynamic changes that popularise new ideas and thus trigger economic growth.

In compliance with Schumpeterian economic theory, the 'churn' rate is a perturbation measure and indicates that economy can adapt its production structure to changing market requirements. In the case of competing economies both high 'birth' rate and 'death' rate in a given period can be observed (Nunes, Sarmento 2010). It has to emphasised that economies with the prevalence of small and micro enterprises (as in the case of Poland) are characterised by a high 'churn' rate. Persistent high level of this rate in Poland suggests great adaptation capabilities of the Polish enterprise market. A more intensive 'churn' rate increase, as a result of last crisis, has been recorded since 2009. Due to certain inertia of central registers systems (REGON in Poland) the effects of real changes caused by the crisis will be visible with a delay. In 2007 the rate value of 29,6% places Poland at top position in Europe (see figure 2). Cyprus, Belgium, Sweden and Austria come at the end of the list of countries that provided data on demographic rates for enterprises.

4. *Relationship between demographic rates and macroeconomic indicators*

Based on Eurostat and Central Statistical Office data a correlation between basic macroeconomic indicators and demographic rates was estimated. Macroeconomic indicators were represented by the following values:

- GDP per capita in PPS values (PPS Purchasing Power Standards (EU27=100))
- GDP in real values (dynamics vs. previous year)
- Inflation (CPI) in %
- Unemployment rate in %
- Demographic rates were represented by the following measures:
- Birth rate in %
- Death rate in %
- Difference between the birth rate and death rate in %
- Total birth rate and death rate in % (so-called 'churn' rate).

Available data referred to the countries listed in the table in the appendix. The strongest correlation was recorded for the 'death' rate and unemployment rate in 2005 (i.e. with an anticipation effect) and the unemployment rate in 2007 and enterprise population dynamics (defined as: difference between 'birth' rate and 'death' rate). A significant interdependence was identified between the birth rate and real GDP from 2007 i.e. without an anticipation effect or delay. Unemployment might be considered as so-called 'push' factor for jobless people to set up own businesses. Own company is becoming an alternative to seeking another forms of employment. GDP growth stimulates establishing new business entities. The relationship between demographic rates for enterprise population and inflation is the strongest for enterprise dynamics (difference between the 'birth' rate and 'death' rate) and the inflation rate from 2005. However, this interdependence is weaker than in previous cases.

5. *Situation in Poland over the years 1997-2010*

Some relationships between basic macroeconomic indicators and demographic rates can be observed in Poland even in such a short period of time as the years 1997-2010. Fully verifiable statistical conclusions on correlation would require a substantially longer observation period.

Procyclicality of changes in business population dynamics and its retention (see figure 3) can be noticed even for short observation periods. Fluctuations in dynamics measured as the difference between the 'birth' rate and 'death' rate overlap with the changes in inflation rates. It was only in the years 2002-2003 that slight inertia in enterprises' population dynamics in relation to a decrease in inflation could be visible. A direct interrelationship between enterprise population dynamics and the unemployment level cannot be identified for certain. A more salient negative interdependence may be noticed between unemployment and enterprise retention measured by a total of 'birth' and 'death' rates. In periods of high unemployment economy shows lower retention i.e. fluctuations in the number of companies that enter and exit the market. High unemployment, in turn, might encourage entrepreneurs to set up new companies. After a period of high unemployment labour market absorbs self-employed people leading to an increased enterprise retention and a decline in unemployment in the subsequent years.

According to Schumpeter's theory of creative destruction high level of "churn" ratio indicates the ability of the market to adopt quickly to changes in macroeconomic conditions. The level of this ratio in Poland was quite high in recent years. In years 2002-2005 this ratio level was the lowest, because we observed decreasing level of birth rate with stable level of death rate. Increasing level of "churn" rate in recent years 2006-2010 is observed. Positive correlation was confirmed for "churn" rate and GDP and negative between "churn" rate and unemployment. This correlation confirm assumptions of Schumpeter's theory of effective allocation of resources in the economy.

Enterprise population dynamics is significantly dependent of GDP value. In the period of the dramatic GDP drop in the years 2001-2003, enterprise population dynamics fell and then stabilized at a low level in the years 2004-2008 despite the fact that in this period GDP levelled off at about 5%. After 2008 economy slumped into recession again, which resulted in a GDP drop and enterprise population growth dynamics falling to zero. It was not until 2010 that a growth of both GDP and business population dynamics could be observed.

The evaluation of long-term interdependences at macroeconomic level is impeded due to a short observation period. Neither do the results for other countries confirm relationships between basic macroeconomic and measures and demographic indicators.

Worth mentioning is the vital perturbation noticed in 2009. It was this year that the PKD classification was amended. Following the change that adjusted PKD to comply with the new EU classification – Rev 2.1 – many entrepreneurs were forced to reclassify their companies. As a result, the number of business entities that were deregistered from REGON significantly increased, which was to a great extent due to an automatic closure of inactive entities that had not met their obligation to deregister.

6. *Summary*

Demographic rates as basic indicators of enterprise population growth dynamics serve as a measure that is ahead of changes in economic cycle. This is due to their dependence on changes in macroeconomic factors (GDP, Inflation, Unemployment).

According to Schumpeter's theory of creative destruction described in this paper high level of "churn" ratio indicates the ability of the market to adopt quickly to changes in macroeconomic conditions. In years 2002-2005 this ratio level was the lowest, because we observed decreasing level of 'birth' rate with stable level of 'death' rate. Increasing level of "churn" rate in recent years 2006-2010 is observed. Positive correlation was confirmed for "churn" rate and GDP and negative between "churn" rate and unemployment. This correlation confirm assumptions of Schumpeter's theory of effective allocation of resources in the economy. In periods of high unemployment economy shows lower retention i.e. fluctuations in the number of companies that enter and exit the market. High unemployment, in turn, might encourage entrepreneurs to set up new companies. After a period of high unemployment labour market absorbs self-employed people leading to an increased enterprise retention and a decline in unemployment in the subsequent years. A significant interdependence was identified also between the 'birth' rate and real GDP from 2007 i.e. without an anticipation effect or delay.

There are however still remaining questions to answer: Should positive enterprise population growth be expected in the following years? Or is it likely that an unfavourable trend observed in enterprise retention i.e. market adaptation capabilities, reaction capabilities to competition activities and effective resources allocation will prevail? It is demographic indicators applied in enterprise population studies and observation of their changes with time that will answer these questions. The project 'business demography' is essential to scientists, entrepreneurs and politicians who make strategic decisions and therefore should also cover countries beyond EU member states.

References

Balcerowicz, E. 1999. Część II. Bariery rozwoju sektora prywatnego w Polsce. W: B. Błaszczyk (Red.), Uwarunkowania wzrostu sektora prywatnego w Polsce, Raport CASE nr 30. Warszawa 1999.

Bałtowski, M., Żminda, Sz. 2007. Struktura własnościowa i branżowa a wyniki największych polskich przedsiębiorstw, w: Przedsiębiorstwa sektora prywatnego i publicznego w Polsce (1999-2005). Zeszyty BRE Bank-CASE nr 89/2007.

Bruderl J., Schussler, R. Organizational mortality: the liability of newness and adolescence. "Administrative Science Quarterly", nr 35(3) 1990.

Business demography in Europe. Enterprise publications. Observatory of European SMEs 2002/No 5. European Commission 2002.

Business demography in Europe. Results for 10 Member States and Norway. Data 1997-2001. „Statistics in Focus" European Commission. Eurostat 2004.

Carroll, G., Hannan, M.T. 2000. The Demography of Organizations and Industries, Princeton University Press.

Caves, R., Porter, M.E., 1977. From Entry Barriers to Mobility Barriers, Quarterly Journal of Economics 91, str 241-261,

Ericsson, R., Pakes, A. 1995. Markov perfect industry dynamics: A framework for empirical analysis. Review of Economic Studies, nr 62(1), str. 53-82.

Fichman, M., Levinthal, D. 1998. Honeymoons and the liability of adolescence: A New perspective on duration dependence in social and organizational relationships. The Academic of Management Review, nr 16(2), str. 442-468.

Gruszecki, T. 2008. Instytucjonalne aspekty w teorii przedsiębiorstwa. W: Mączyńska (Red.), Bankructwa przedsiębiorstw. Wybrane aspekty instytucjonalne. Przedsiębiorstwo Współczesne. Kolegium Nauk o Przedsiębiorstwie, SGH.

Hannan, M.T., Freeman, J.H. 1989. Organizational Ecology, Harvard University Press, Cambridge, MA.

Jovanovic, B., 1982. Selection and evolution of industry, "Econometrica" nr 50(3), str 649-670.

Noga, A. 2009, Teorie przedsiębiorstw, PWE, Warszawa.

Nunes A., Sarmento E. B*usiness Demography Dynamics in Portugal: A Non-Parametric Survival Analysis*. Estudos do GEMF No. 9 2010.

Nunes A., Sarmento E. *Business Demography Dynamics in Portugal: A Semi-Parametric Survival Analysis*. Estudos do GEMF No. 10 2010.

Pereira, C. 2001. A social Representation of the Businessman, Stabilo Publisher.

Porter, M.E. 1979. The structure within industries and companies performance, Review of Economic and Statistics 61 str. 214-227.

Poznańska, K., 2008. Cykle życia przedsiębiorstw a instytucjonalna infrastruktura ich funkcjonowania. W: E. Mączyńska (Red.), Bankructwa przedsiębiorstw. Wybrane aspekty instytucjonalne. Przedsiębiorstwo Współczesne. Kolegium Nauk o Przedsiębiorstwie, SGW Warszawa.

Ptak-Chmielewska A., *Cykl życia i likwidacja przedsiębiorstw - wymiar ilościowy. Analiza porównawcza Polska - Unia Europejska*. In: Mączyńska E. (ed.) *Cykle życia i bankructwa przedsiębiorstw*. Oficyna Wydawnicza SGH, Warszawa 2010, s. 65-88.

Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2008–2009, Raport PARP, Warszawa 2010.

Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2008-2009, PARP, Warszawa 2010.

Scarpetta, S., Bassanini, A. Pilat, D. Schreyer, P. 2000. Economic growth in the OECD area: recent trends at the aggregate and sectoral levels. OECD Economics Department Working Paper 248, Paris.

Schumpeter, J. 1934. Theory of Economic Development, Harvard University Press. Cambridge.

Szymański P., *Statystyczny obraz narodzin i zgonów przedsiębiorstw*. In: Mączyńska E. (ed.) *Bankructwa przedsiębiorstw. Wybrane aspekty instytucjonalne*, SGH, Warszawa 2008.

Vale S., *The international comparability of Business Start-up Rates Final Report*. OECD Statistics Working Papers nr 4/2006.

Figures and tables

Figure 1. Difference between the enterprise 'birth' rate and 'death' rate for selected European countries, 2007.
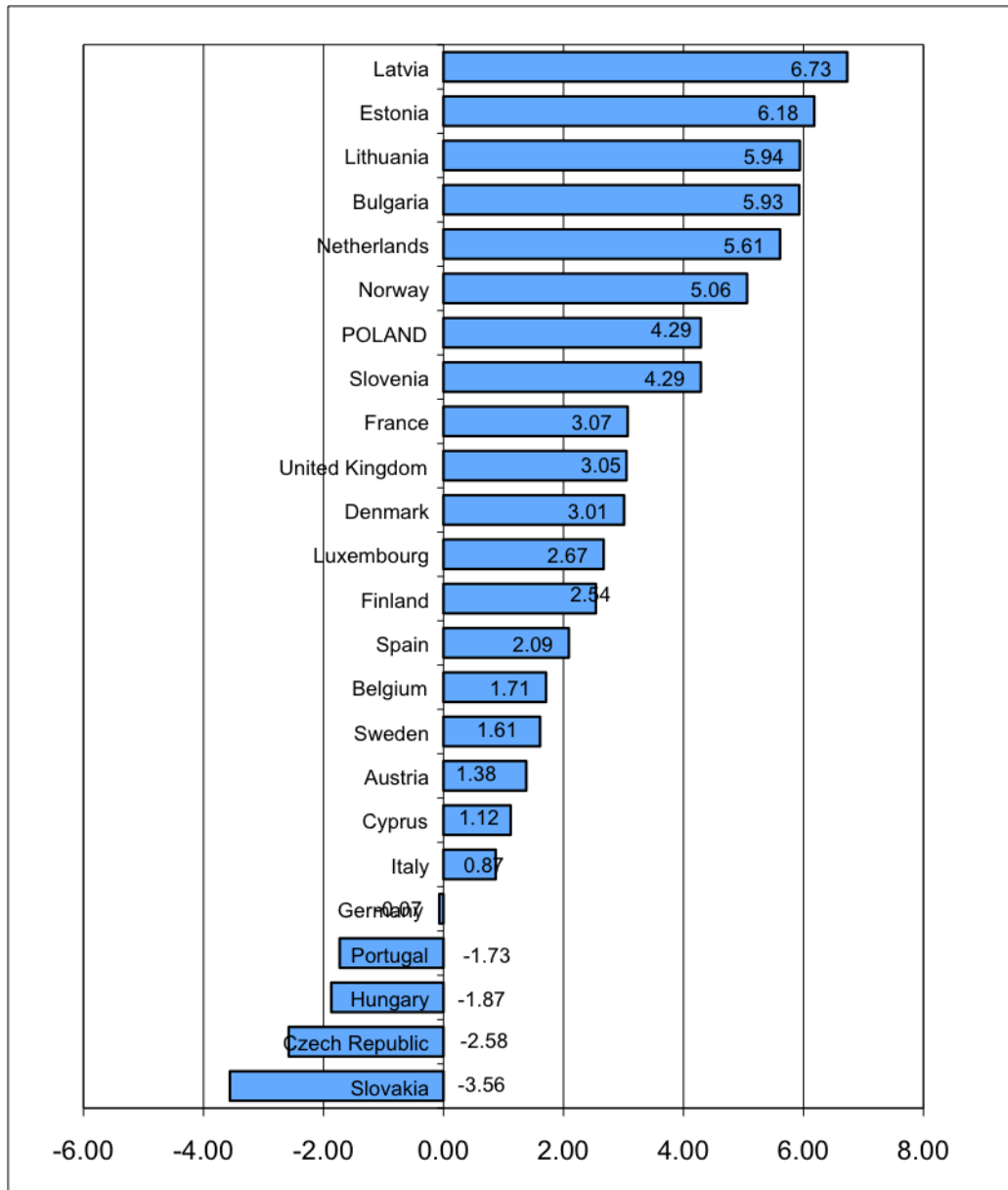
Source: own study based on Eurostat and Central Statistical Office data. (if birth rate for the year 2007 was unavailable, the birth rate for the previous year was taken; as in the case of Hungary, Portugal, Finland, Cyprus, Denmark, Slovenia, Lithuania, Latvia and Estonia the birth rate for 2006 was taken into account).

Figure 2. Sum of enterprise 'birth' rate and 'death' rate ('churn' rate) for selected European countries, 2007.
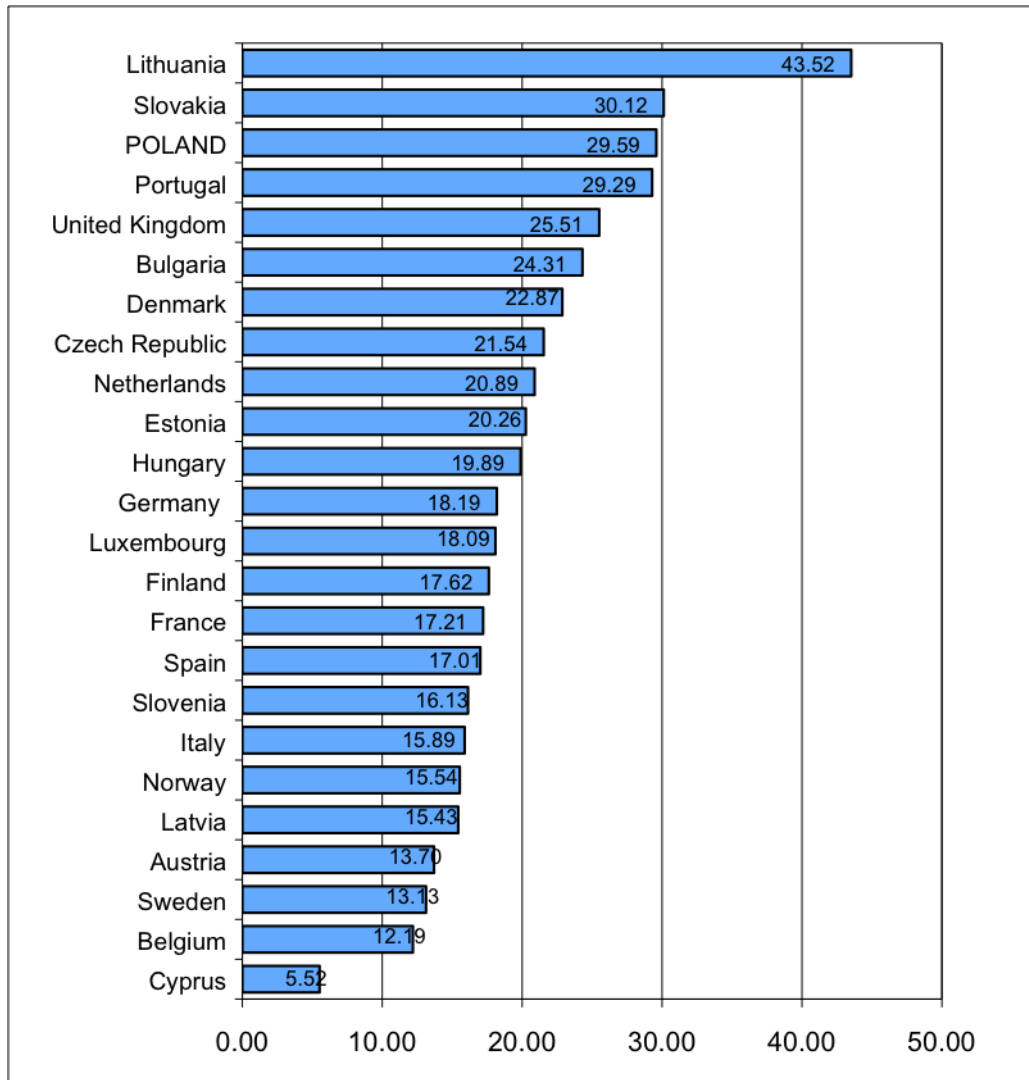
Source: own study based on Eurostat and Central Statistical Office data. (if birth rate for the year 2007 was unavailable, the birth rate for the previous year was taken; as in the case of Hungary, Portugal, Finland, Cyprus, Denmark, Slovenia, Lithuania, Latvia and Estonia the birth rate for 2006 was taken into account).

Table 1.

	GDP per capita in PPS			GDP real			Inflation			Unemployment		
	2005	2007	2010	2010	2007	2005	2005	2007	2010	2010	2007	2005
Birth rate 2007	-0.33*	-0.30	-0.30	-0.06	0.45*	0,36*	0,19	0,29	-0,10	0,41*	0,03	0,27
Death rate 2007	-0,36*	-0,34*	-0,32	0,17	0,28	0,11	-0,06	0,05	-0,03	0,34*	0,39*	0,46*
Diff 2007	0,03	0,04	0,02	-0,34*	0,25	0,36*	0,37*	0,34*	-0,10	0,12	-0,51*	0,25
Churn 2007	-0,37*	-0,34*	-0,33*	0,06	0,39*	0,25	0,07	0,18	-0,07	0,40*	0,22	0,39*

Source: own calculations based on Eurostat and Central Statistical Office data. Statistically relevant rates at the level of 0,1 are marked with *.

Figure 3. Basic macroeconomic values and demographic indicators for Poland in total, 1997-2010.
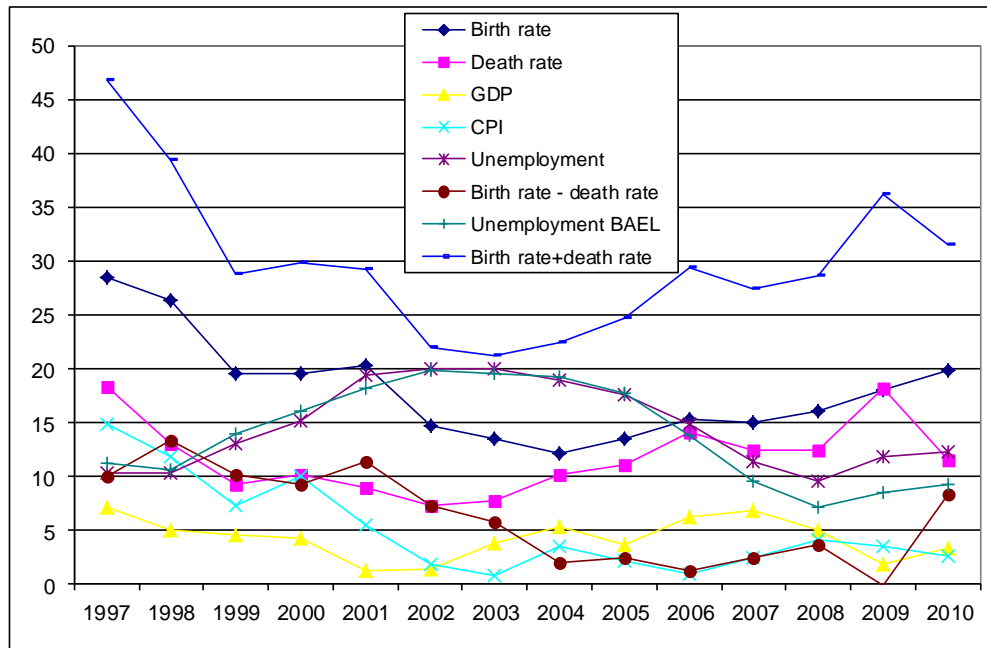
Source: own study based on Central Statistical Office data. Data from REGON register and Central Statistical Office publication: *Działalność przedsiębiorstw niefinansowych* za poszczególne lata (www.stat.gov.pl).

Appendix

Country	GDP per capita in PPS			GDP real			Inflation			Unemployment			Birth rate 2007	Death rate 2007	Diff 2007	Churn 2007
	2005	2007	2010	2010	2007	2005	2005	2007	2010	2010	2007	2005				
Spain	102	105	101	-0,1	3,6	3,6	3,4	2,8	2,0	20,4	8,3	9,2	9,55	7,46	2,09	17,01
Netherlands	131	132	134	1,8	3,9	2,0	1,5	1,6	0,9	4,3	3,6	5,3	13,25	7,64	5,61	20,89
Latvia	49	56	52	-0,3	10	10,6	6,9	10,1	-1,2	17,2	6	8,9	11,08	4,35	6,73	15,43
Cyprus	91	93	98	1,0	5,1	3,9	2	2,2	2,6	6,9	4,0	5,3	3,32	2,2	1,12	5,52
Belgium	120	116	118	2,2	2,9	1,7	2,5	1,8	2,3	7,9	7,5	8,5	6,95	5,24	1,71	12,19
Norway	176	179	179	0,3	2,7	2,7	1,5	0,7	2,3	3,4	2,5	4,5	10,3	5,24	5,06	15,54
Austria	124	123	125	2,1	3,7	2,5	2,1	2,2	1,7	4,2	4,4	5,2	7,54	6,16	1,38	13,7
Italy	105	104	100	1,3	1,5	0,7	2,2	2,0	1,6	8,3	6,1	7,7	8,38	7,51	0,87	15,89
Finland	114	118	116	3,1	5,3	2,9	0,8	1,6	1,7	8,1	6,9	8,4	10,08	7,54	2,54	17,62
France	110	108	107	1,5	2,3	1,8	1,9	1,6	1,7	9,6	8,4	9,3	10,14	7,07	3,07	17,21
Germany	117	116	119	3,6	2,7	0,8	1,9	2,3	1,2	6,6	8,7	11,2	9,06	9,13	-0,07	18,19
Sweden	122	125	123	5,7	3,3	3,2	0,8	1,7	1,9	7,8	6,1	7,7	7,37	5,76	1,61	13,13
Slovenia	87	88	87	1,2	6,8	4,0	2,5	3,8	2,1	8,0	4,9	6,5	10,21	5,92	4,29	16,13
United Kingdom	122	116	114	1,4	2,7	2,2	2,1	2,3	3,3	7,8	5,3	4,8	14,28	11,23	3,05	25,51
Bulgaria	37	40	43	0,2	6,4	6,4	6	7,6	3	11,4	6,9	10,1	15,12	9,19	5,93	24,31
Czech Republic	76	80	80	2,3	6,1	6,3	1,6	3,0	1,2	7,2	5,3	7,9	9,48	12,06	-2,58	21,54
Hungary	63	62	64	1,2	0,8	3,2	3,5	7,9	4,7	11,3	7,4	7,2	9,01	10,88	-1,87	19,89
Portugal	79	79	81	1,3	2,4	0,8	2,1	2,4	1,4	11,2	8,1	7,7	13,78	15,51	-1,73	29,29
Estonia	62	69	65	3,1	6,9	9,4	4,1	6,7	2,7	14,5	4,7	7,9	13,22	7,04	6,18	20,26
Denmark	124	123	125	2,1	1,6	2,4	1,7	1,7	2,2	7,6	3,8	4,8	12,94	9,93	3,01	22,87
Lithuania	53	59	**58**	**1,3**	9,8	7,8	2,7	5,8	**1,2**	**17,3**	4,3	8,3	**24,73**	**18,79**	**5,94**	**43,52**
POLAND	51	54	**62**	**3,8**	6,8	3,6	2,2	2,6	**2,7**	**9,5**	9,6	17,8	**16,16**	**13,43**	**2,73**	**29,59**
Slovakia	60	68	74	4,0	10,5	6,7	2,8	1,9	0,7	14	11,1	16,3	13,28	16,84	-3,56	30,12
Luxembourg	254	275	283	3,5	6,6	5,4	3,8	2,7	2,8	4,6	4,2	4,6	10,38	7,71	2,67	18,09

Source: own study based on Eurostat and Central Statistical Office data. (if birth rate for the year 2007 was unavailable, the birth rate for the previous year was taken; as in the case of Hungary, Portugal, Finland, Cyprus, Denmark, Slovenia, Lithuania, Latvia and Estonia the birth rate for 2006 was taken into account).