

Koster, Sierdjan; Van Stel, André; Folkeringa, Mickey

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Start-up intensity, competition and regional economic development

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VERY PRELIMINARY VERSION: NOT TO BE QUOTED

The relationship between start-ups, market mobility and employment growth: An empirical analysis for Dutch regions

Sierdjan Koster^A and André van Stel^{B,C}

^A University of Groningen, The Netherlands

^B EIM Business and Policy Research, Zoetermeer, the Netherlands

^C University of Amsterdam, the Netherlands

Abstract

Recent literature suggests that two types of competition may contribute to macro-economic performance: the extent of new-firm entry and the extent of competition among incumbent firms. In the present paper we explain employment growth at the region-sector level, using indicators for both these types of competition -the start-up rate and the market mobility rate- as main independent variables. We find several interesting results. First, when it comes to explaining regional variations in employment growth -holding constant the sector of economic activity- we find non-significant results for both measures of competition for industry sectors (manufacturing and construction), but significant positive effects of both measures for services sectors. Second, when the model allows the variables to explain sectoral variations in employment growth as well, coefficients for both measures of competition are significantly positive in both industry and services sectors. Third, the effects of start-ups are generally somewhat stronger than those of market mobility. Fourth, the market mobility rate seems to play a bigger role in explaining sectoral variations in employment growth than in explaining regional variations. Fifth, somewhat surprisingly, we do not find evidence for interaction effects between the two types of competition. To the best of our knowledge, we are the first to include measures for both these types of competition in a model of regional growth. Therefore, our regression results add to the knowledge base on the relation between competition by new and incumbent firms, and regional economic performance.

Keywords: start-ups, incumbent firms, competition, market mobility, employment growth

JEL codes: O18, L16, M13

Contact: Sierdjan Koster, sierdjan.koster@rug.nl, André van Stel, ast@eim.nl

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INTRODUCTION

An important strand of empirical research into the relation between new-firm start-ups and regional growth suggests that the main impact of new-firm entries on regional growth is indirect and comes with a lag (Fritsch, 2008). Although new firms have a direct impact by employing workers, the more important impact is assumed to be indirect by stimulating incumbent firms to perform better. This process is found to take several years as the least competitive incumbent and new firms first have to leave the market as a result of the increased competition caused by the new firms (creative destruction), after which the market has been reformed and the most competitive new and incumbent firms survive and grow their businesses so that the market under consideration ultimately grows. Moreover, incumbent firms are only stimulated to perform better if the quality of the new-firm start-ups is sufficiently high.

The strand of empirical research referred to above, and summarized in Fritsch (2008), generally supports this theory. Basically, competition induced by new firms causes competition among incumbent firms to increase as well which, in turn, leads to economic growth. However, the empirical models employed in this type of research only use start-up rate data of several lags, and do not directly measure the extent of competition among incumbent firms. Hence, the empirical support for the theory is indirect. In this paper we employ a direct measure of competition among incumbent firms called market mobility. The indicator was developed in Folkerling et al. (2008) and used earlier in Koster et al. (2011).

In our regression models we explain employment growth using the start-up rates (capturing competition among new firms) and the market mobility rates (capturing competition among incumbent firms) as main independent variables. This set-up allows us to actually test which type of competition has the strongest effects on employment growth at the region-sector level in the Netherlands.

To the best of our knowledge, we are the first to include measures for both these types of competition in a model of regional growth. Therefore, our regression results add to the knowledge base on the relation between competition by new and incumbent firms, and regional economic performance.

THEORY

To be developed.

MARKET MOBILITY INDICATORS

Market mobility indicators measure to what extent a ranking of a population of firms (in terms of economic performance) changes over time. If the ranking is stable (i.e. the same

firms are at the high and low ends of the ranking in two years of comparison), then market mobility is low. If there is a lot of change in the ranking, then market mobility is high. High market mobility rates are assumed to reflect high intensities of competition. As Baldwin and Gorecki (1994) put it: "Mobility indices measure the outcome of the competitive process in terms of transfer of market shares from losers to winners. Much of what happens during the competitive process will be manifested by changes in relative firm position" (p. 95).

In this paper we employ an indicator of market mobility, at the region-sector level, where the mobility rates reflect the degree of change over the period 2000-2006 in the ranking of establishments with five or more people in terms of employment size. The indicator reflects the level of competition among incumbent firms for each market identified in this study (i.e. for each region-sector combination). These mobility indices were developed in Folkeringa et al. (2008) and used in empirical analysis in Koster et al. (2011). The construction of these indices involves a huge longitudinal data base at the firm level, and a Markov chain methodology to convert the firm level data into a measure of competition for the markets under consideration. We refer to these two publications for further details about this indicator.

DATA AND MODEL

The theoretical argument the analysis addresses is the Schumpeterian expectation that start-ups cause a process of creative destruction or competition among incumbent firms. Through this process of competition (or shake out), the fittest firms remain which should in turn lead to economic development. Hence, a cohort of start-ups could contribute to macro-economic performance by inducing incumbent firms to perform better, i.e. by increasing competition among incumbent firms. However, start-ups can also contribute directly, for instance when the most successful ones grow out to become large firms (high-growth firms). In this paper we test which type of competition, i.e. competition among new firms or among incumbent firms, contributes most to regional and sectoral performance.

We apply a multivariate regression analysis which explains employment growth in the Netherlands for 2000 to 2006. The main explanatory variables for our purpose are the start-up rate (lagged and current) and a market mobility measure which indicates the level of competition among incumbent firms (see also Folkeringa et al., 2008 and Koster et al., 2011). The analysis is done at the region-sector level. The regional dimension is at the NUTS-III spatial aggregation level, also known as COROP classification. This implies 40 regions are included. Regarding sectors, the data allows for a five-sector classification (cf. van Stel and Suddle, 2008): manufacturing (International Standard Industrial Classification code D), construction (ISIC code F), trade (ISIC codes GH), transport & communication (ISIC code I), and services (ISIC codes JKNO). The following variables are included in the empirical analysis.

- Percentage employment change 2000-2006

This is the dependent variable. It is generally used as an indicator of regional economic development (see, for example, Fritsch and Mueller, 2004).

- Market mobility rate 2000-2006

This is the main explanatory variable. As an indicator of competition it is expected to have a positive effect on employment growth. Mobility rates are computed using data for those establishments which have five or more workers both in 2000 and in 2006. Firm entries and exits are excluded from this measure. Data on individual firms are taken from the data base REACH (REview and Analysis of Companies in Holland), which is operated by a private firm called Bureau van Dijk. The original source of these data is the so-called 'Handesregister' (Trade record) maintained by the Dutch Chambers of Commerce. Initially, for each region mobility rates are computed at the sector level distinguishing 16 industries (cf. Folkeringa et al, 2008). Next, the mobility rates are aggregated towards the five-sector level described above using a sectoral weighting scheme.ⁱ

- Average start-up rate 1999-2005.

Following the labour market approach, the start-up rate is calculated as the number of new-firm start-ups divided by employment. The data on the number of start-ups are taken from the Dutch Chambers of Commerce. The number of start-ups is defined to include all independent new-firm registrations. It includes both new firms with employees and new firms without employees. Mergers, new subsidiary companies, new branches and relocations to other regions are not counted as a start-up. Data on employment are taken from Statistics Netherlands and the employment figures relate to employee jobs expressed in full-time equivalents (labour years).ⁱⁱ

- Average start-up rate 1993-1999.

The impact of start-ups on employment growth may be lagged (see, for example, Fritsch and Mueller, 2004). Therefore the analyses include lagged start-up rates.

In addition to our main variables of interest several control variables have been included in the analyses. These are population density, wage development in the period 2000–2006 and lagged employment change.

- Population density.

In the models, population density is included as a catch-all variable that is strongly correlated to aspects such as educational attainment, income levels and market access. As such it represents several aspects that may influence regional employment growth. Data for population density are taken from Statistics Netherlands. Population density varies only at the regional level.

- Wage development 2000 – 2006

The variable has been calculated in prices of 2000 in order to correct for inflation.

- Lagged employment growth (1993-1999)

This variable is included to correct for reversed causality (Granger, 1969).

- Sector dummies

As shown in Koster et al. (2011), there is an important sector dimension in the relationship between mobility and start-ups dynamics. Therefore, in order to correct for possible sector influences in the relationship between start-ups, mobility and economic development, sector dummies are included in the analysis. Also we split the sample two-way and assess industry sectors and services sectors separately.

- Regional dummies

Finally, we include regional dummies at a high spatial aggregation level. These dummies group the 40 NUTS-III regions (our unit of analysis) into four larger groups (NUTS-I). Inclusion of these dummies helps preventing possible spatial autocorrelation caused by unobserved heterogeneity (Van Stel and Nieuwenhuijsen, 2004).

RESULTS

Table 1 presents the results of the pooled OLS model for all industries together. The table contains model variants including and excluding sectoral dummies, and variants using current or lagged start-up rates. When we focus purely on explaining regional variations, holding constant the sector of economic activity (i.e. variants II and IV), we see that model IV performs better than model II. The R^2 is higher. This means that lagged start-ups have a bigger influence on employment growth than current start-ups, consistent with the theory (Fritsch, 2008). We see that both the market mobility rate and the lagged start-up rate are positive and highly significant. However, since the variables have a different scale, the coefficients cannot be compared. In order to compare the size of the effects of the two variables, we computed the effect of a change of one standard deviation in either the lagged start-up rate or the mobility rate. See Table 4 (and variant IV). The effect of start-ups on explaining regional variations (given the sector) is clearly stronger for start-ups.

However, when the variables are allowed to explain sectoral variations in employment growth as well, i.e. when we do not include sector dummies, the difference is less clear-cut. In model I (which has a slightly higher R^2 than model III), both mobility and start-ups have a significantly positive effect. However, the coefficient of mobility is now higher and that of start-ups lower, compared to model IV. Indeed, when looking at model I in Table 4, we see that the effect of one standard deviation is now bigger for mobility. We have to be careful though, as in model III, which has only a slightly lower R^2 , the pattern is reversed. What is clear though, is that variations in market mobility rates play a bigger role in explaining sectoral variations in employment growth than they do in explaining regional differences.

For industry services we find no impact of both the start-up rate and the market mobility rate in explaining regional variations in employment growth (Table 2, models II and IV). When the variables are allowed to explain sectoral differences as well (manufacturing versus construction), they both have positive effects (models I and III) and the effect of start-ups is bigger (Table 5).

For services both indicators of competition are significantly positive both when explaining purely regional variations (Table 3, Model IV) and when explaining regional *and* sectoral variations in employment growth (Table 3, Model I). Table 6 shows that the impact of start-ups is marginally larger than that of mobility rates.

Somewhat surprisingly, when interacting both measures of competition, we did not find any significant effects.

ⁱ We aggregate towards the five-sector classification because the start-up rate variable is not available at lower sectoral aggregation levels.

ⁱⁱ Because of a change in the employment data at Statistics Netherlands, data for 2006 are not comparable to 2005. Therefore, we use the average of 1999-2005 instead of 2000-2006, the period for which we measure mobility.

Table 1. Estimation results all industries (total sample)

Variable	I	II	III	IV
Constant	-29.19 (4.23)***	-19.62 (5.52)***	-30.13 (4.18)***	-21.85 (5.33)***
Population density	-0.23 (0.10)**	-0.26 (0.10)**	-0.20 (0.11)*	-0.23 (0.10)**
Average wage growth (00-06)	0.47 (0.06)***	0.39 (0.07)***	0.45 (0.05)***	0.39 (0.06)***
Lagged employment growth (93-99)	0.15 (0.04)***	0.09 (0.05)*	0.13 (0.04)***	0.06 (0.05)
Market Mobility (Mu)	0.31 (0.07)***	0.21 (0.08)**	0.32 (0.07)***	0.21 (0.08)***
Start-up rate (99-05)	0.33 (0.08)***	0.19 (0.15)		
lagged Start-up rate (93-99)			0.43 (0.12)***	0.45 (0.15)***
Dummy Manufacturing (D)		-3.78 (2.26)*		-3.05 (2.21)
Dummy Construction (F)		0.38 (3.84)		0.11 (2.68)
Dummy Trade (GH)		0.08 (1.88)		-1.36 (1.84)
Dummy Transport (I)		--		--
Dummy Bus. Services (JKNO)		7.06 (2.14)***		7.88 (2.01)***
Dummy North	1.38 (1.69)	1.28 (1.63)	1.27 (1.74)	1.33 (1.63)
Dummy East	2.16 (1.49)	2.57 (1.45)*	2.39 (1.53)	3.03 (1.42)**
Dummy West	--	--	--	--
Dummy South	2.96 (1.81)	1.90 (1.62)	2.96 (1.81)	2.68 (1.62)*
adjusted R-squared	0.65	0.67	0.64	0.69
loglikelihood	-680.10	-670.47	-682.20	-666.31
N	199	199	199	199

Note: Pooled OLS regressions for all industries with robust standard errors, standard errors in parentheses.

Dependent variable: Percentage employment change between 2000 and 2006

***: $p < 0.01$; **: $p < 0.05$; *: $p < 0.10$.

Table 2. Estimation results Industry (manufacturing + construction)

Variable	I	II	III	IV
Constant	-26.35 (7.78)***	-23.00 (8.01)***	-26.91 (7.51)***	-22.68 (7.76)***
Population density	-0.15 (0.12)	-0.03 (0.13)	-0.13 (0.14)	-0.05 (0.13)
Average wage change (00-06)	0.45 (0.10)***	0.50 (0.11)***	0.44 (0.09)	0.51 (0.10)***
Lagged employment change (93-99)	0.07 (0.07)	0.05 (0.08)	0.05 (0.08)	0.03 (0.08)
Market Mobility (Mu)	0.28 (0.14)**	0.21 (0.14)	0.26 (0.14)*	0.19 (0.14)
Start-up rate (99-05)	0.33 (0.12)***	-0.05 (0.15)		
lagged Start-up rate (93-99)			0.57 (0.19)***	0.17 (0.21)
Dummy Manufacturing (D)		-11.74 (3.66)***		-9.03 (3.02)***
Dummy Construction (F)		--		--
Dummy North	-0.37 (2.21)	0.27 (2.26)	0.13 (2.16)	0.54 (2.19)
Dummy East	1.88 (2.15)	1.58 (2.02)	2.07 (2.17)	1.99 (2.00)
Dummy West	--	--	--	--
Dummy South	-3.29 (2.25)	-3.48 (2.24)	-2.34 (2.33)	-2.85 (2.22)
adjusted R-squared	0.37	0.44	0.38	0.45
loglikelihood	-259.41	-254.97	-259.41	-254.64
N	79	79	79	79

Note: Pooled OLS regressions for Industry sectors with robust standard errors, standard errors in parentheses.

Dependent variable: Percentage employment change between 2000 and 2006

***: $p < 0.01$; **: $p < 0.05$; *: $p < 0.10$.

Table 3. Estimation results Services (trade + transport + business services)

Variable	I	II	III	IV
Constant	-27.88 (6.46)***	-23.14 (6.09)***	-29.60 (7.32)***	-25.09 (5.94)***
Population density	-0.30 (0.13)**	-0.32 (0.11)***	-0.33 (0.13)**	-0.30 (0.11)***
Average wage change (00-06)	0.42 (0.07)***	0.30 (0.09)***	0.44 (0.08)***	0.30 (0.08)***
Lagged employment change (93-99)	0.14 (0.05)***	0.09 (0.05)	0.18 (0.05)***	0.06 (0.05)
Market Mobility (Mu)	0.27 (0.09)***	0.22 (0.08)***	0.34 (0.10)***	0.24 (0.09)***
Start-up rate (99-05)	0.52 (0.25)**	0.61 (0.31)**		
lagged Start-up rate (93-99)			0.14 (0.17)	0.58 (0.19)***
Dummy Trade (GH)		-2.73 (2.51)		-2.64 (1.97)
Dummy Transport (I)		--		--
Dummy Bus. Services (JKNO)		5.55 (2.61)**		8.41 (2.04)***
Dummy North	2.31 (2.30)	2.19 (2.10)	1.89 (2.37)	1.82 (2.16)
Dummy East	2.73 (2.06)	3.29 (2.03)	2.21 (2.07)	3.73 (1.96)
Dummy West	--	--	--	--
Dummy South	6.18 (2.33)***	6.30 (1.98)***	6.06 (2.42)**	6.91 (1.99)***
adjusted R-squared	0.57	0.63	0.55	0.64
loglikelihood	-410.63	-400.65	-412.89	398.63
N	120	120	120	120

Note: Pooled OLS regressions for Service sectors with robust standard errors, standard errors in parentheses.

Dependent variable: Percentage employment change between 2000 and 2006

***: $p < 0.01$; **: $p < 0.05$; *: $p < 0.10$.

Table 4: The effects of 1 SD change in main variables, whole sample (N=199)

Variable Name	Coefficient				St.Dev.	Effect of 1 SD			
	I	II	III	IV		I	II	III	IV
Market Mobility (Mu)	0.31	0.21	0.32	0.21	8.79	2.72	1.85	2.81	1.85
Start-up rate (99-05)	0.33	0.19			5.93	1.96	1.13		
lagged Start-up rate (93-99)			0.43	0.45	8.42			3.62	3.79

Table 5: The effects of 1 SD change in main variables, industry sectors (N=79)

Variable Name	Coefficient				St.Dev.	Effect of 1 SD			
	I	II	III	IV		I	II	III	IV
Market Mobility (Mu)	0.28	0.21	0.26	0.19	7.31	2.05	1.54	1.90	1.39
Start-up rate (99-05)	0.33	-0.05			7.43	2.45	-0.37		
lagged Start-up rate (93-99)			0.57	0.17	12.20			6.95	2.07

Table 6: The effects of 1 SD change in main variables, services sectors (N=120)

Variable Name	Coefficient				St.Dev.	Effect of 1 SD			
	I	II	III	IV		I	II	III	IV
Market Mobility (Mu)	0.27	0.22	0.34	0.24	7.88	2.13	1.73	2.68	1.89
Start-up rate (99-05)	0.52	0.61			4.64	2.41	2.83		
lagged Start-up rate (93-99)			0.14	0.58	3.83			0.54	2.22

CONCLUSIONS

Recent literature suggests that two types of competition may contribute to macro-economic performance: the extent of new-firm entry and the extent of competition among incumbent firms. In the present paper we explain employment growth at the region-sector level using indicators for both these types of competition -the start-up rate and the market mobility rate- as main independent variables. We find several interesting results. First, when it comes to explaining regional variations in employment growth -holding constant the sector of economic activity- we find non-significant results for both measures of competition for industry sectors (manufacturing and construction), but significant positive effects of both measures for services sectors. Second, when the model allows the variables to explain sectoral variations in employment growth as well, coefficients for both measures of competition are significantly positive in both industry and services sectors. Third, the effects of start-ups are generally somewhat stronger than those of market mobility. Fourth, the market mobility rate seems to play a bigger role in explaining sectoral variations in employment growth than in explaining regional variations. Fifth, somewhat surprisingly, we do not find evidence for interaction effects between the two types of competition. To the best of our knowledge, we are the first to include measures for both these types of competition in a model of regional growth. Therefore, our regression results add to the knowledge base on the relation between competition by new and incumbent firms, and regional economic performance.

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