Entrepreneurship and aggregate productivity

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SUMMARY

This paper examines the contribution of entrepreneurial activity to aggregate productivity in eleven post–socialist new European Union member states over the period 2005–2019. Building on Baumol's distinction between productive and unproductive entrepreneurship, it addresses two questions: whether measures of entrepreneurial activity are correlated with aggregate productivity, and whether that correlation is positive or negative, thereby allowing productive and unproductive entrepreneurship to be distinguished empirically. Productivity is measured by GDP per person employed and GDP per hour worked, entrepreneurial activity by the Global Entrepreneurship Monitor's National Entrepreneurship Context Index, and the institutional environment by the burden of government regulation. Estimating a linear dynamic panel with a one–step generalized method of moments estimator, the analysis finds that the entrepreneurial environment is positively and significantly associated with both productivity measures, while a heavier regulatory burden is negatively associated with them. These results identify the prevailing entrepreneurship in the sample as productive in Baumol's sense. The contribution is twofold: conceptually, the paper offers a theory–to–measurement bridge for the Baumolian framework, and empirically, it documents the entrepreneurship–productivity nexus for a panel of new EU member states.

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Našao sam dobar band, želim samo da sviram, da se otkačim i to je sve
I found a good band, I just want to play to get away and that's all

(A šta da radim – Azra, 1979, Jugoton)

1. Introduction

Few questions in the economic theory have proved as durable, or as elusive, as the contribution of entrepreneurship to aggregate productivity. From Schumpeter (1934) onward, the entrepreneur has been depicted as the agent who pools resources around a new idea. He converts ideas into the new products, processes, and forms of organisation that raise total factor productivity. In a similar vein starting a band can be interpreted as the moment of

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the emergence of an entrepreneurial venture. All the elements are present: gathering a team, creating a new product, entering the market, taking risks and the uncertainty of success.

The interest for entrepreneurship–growth nexus has been propelled by endogenous-growth theory (Aghion & Howitt, 1992), the knowledge-spillover theory of entrepreneurship (Braunerhjelm et al., 2010) and the new institutional economics (North, 1990) which all, in their domain, restored the entrepreneur to the centre of the productivity debate. This study builds on Baumol's (1990) contribution who argued that entrepreneurial talent is present in roughly comparable measure across all societies but how that talent is allocated between productive, unproductive and destructive activities explains divergent productivity records among contemporary economies. Because this allocation is governed by the relative payoffs that prevailing institutions attach to each activity, the productivity question is reframed from one of quantity – how much entrepreneurship – to one of composition and quality – what kind of entrepreneurship a society's rules elicit.

The main goal of the paper is to empirically confirm the role of entrepreneurial activity on the aggregate level of productivity estimated by two measures: GDP per employed and GDP per hour worked. The observed sample includes 11 post-socialist new EU member states between 2005 and 2019. By focusing on aggregate (economy-level) productivity rather than firm-level performance as such positions the paper within competitiveness analysis literature in the field of contemporary political economy. Two research questions are set to be answered in the paper. First, is there a correlation between measures of the entrepreneurial activity and the aggregate level of productivity? Second, is the correlation statistically positive or negative, i.e. can we distinguish between Baumol's (1990) productive and unproductive entrepreneurial activities?

Contribution to the existing literature is twofold. Conceptually, the paper presents theory-to-measurement bridge aimed at the Baumol's approach to entrepreneurship. Empirically, it documents result for a EU member state panel on the effects of entrepreneurial activity on aggregate productivity levels.

The introduction is followed by a review of the theoretical foundations that connects theories on entrepreneurship and aggregate economic outcomes. Data and methodology are defined in the third section. In the fourth section, an empirical analysis was carried out and the research results were interpreted. The results and new findings are summarized in the conclusion section.

2. Theoretical foundations and literature review

This part synthesises the principal theoretical approaches to entrepreneurship and assesses what each implies for aggregate productivity. Three traditions are distinguished: (1) the Schumpeterian (innovation and creative destruction), (2) the Kirznerian (alertness and opportunity discovery) and (3) the Baumolian allocative account of productive, unproductive, and destructive entrepreneurship – together with their endogenous-institution extensions.

In the Schumpeterian (1934) account the entrepreneur is, above all, an innovator who accumulates profit as a reward for successful innovation. Crucially, the Schumpeterian entrepreneur is a disequilibrating force since innovation disturbs the circular flow and displaces less efficient incumbents through the process Schumpeter (1942) labels "creative destruction". Because profit is competed away as imitators enter, the link to productivity is direct and central: aggregate productivity increases due to superior combinations trumping inferior ones.

Aghion & Howitt (1992) formalise this idea of the creative-destruction within endogenous-growth models stating that the rate of productivity growth depends on the intensity of innovative entry. The knowledge–spillover theory of entrepreneurship (Braunerhjelm et al., 2010) casts entrepreneurship as the conduit that converts otherwise dormant knowledge into commercialised innovation and hence into measured productivity. Attractive as it may be, this approach marginalises the routine, imitative and allocative entrepreneurship that constitutes the bulk of business activity. The literature uses the existing classification into "Schumpeter Mark I" and "Schumpeter Mark II" entrepreneur (Henrekson et al., 2024) to determine which type of entrepreneurial activity matters. "Schumpeter Mark I" entrepreneur is a disruptive agent while "Schumpeter Mark II" entrepreneur emerges as his innovative activity is gradually phased out and replaced by routinized R&D processes in large corporations. Surveying more than 700 neo-Schumpeterian growth articles, Henrekson et al. (2024) show that the field overwhelmingly follows "Schumpeter Mark II" approach.

Within the same Austrian tradition of the school of economic thought, Kirzner (1973) casts entrepreneurs as agents characterised by alertness and opportunity discovery. Alertness – the propensity to notice unexploited profit opportunities – is often tied to arbitrage that corrects errors and improves market coordination. Hence, opportunities are discovered rather than created. One should note that Kirzner (2009) himself cautioned that Schumpeterian-versus-Kirznerian dichotomy is misleading since creative entrepreneur – at a higher level of abstraction – is also engaged in arbitrage. Thus, Schumpeterian creativity can be subsumed within the alertness that drives the market process as the main engine of economic growth. Productivity wise, the Kirznerian contribution is the elimination of waste and the improvement of resource allocation through superior information processing. The "opportunity" it foregrounds became the organising construct of an entire research programme in entrepreneurship studies (Shane & Venkataraman, 2000; Eckhardt & Shane, 2003). Disadvantages of this approach stem from the fact that alertness is difficult to operationalise and measure and that the Kirznerian framework speaks only indirectly to aggregate productivity. Jakee & Spong (2003) contend that alertness functions as an under–specified black box, that Kirzner's equilibrating account remains essentially deterministic and that it cannot on its own explain the genuinely creative innovation and endogenous change that the aggregate-productivity question ultimately requires.

Baumol (1990) shifts the analytical focus from the nature of the entrepreneur to the destination of entrepreneurial effort. Holding the supply of entrepreneurship talent roughly constant across societies, he argues that the productivity contribution of that effort varies with its allocation among productive activities (innovation, commerce), unproductive activities (rent-seeking, litigation, tax avoidance) and destructive activities (organised crime, predatory warfare). The allocation is determined by the structure of relative payoffs, which is in turn set by the prevailing institutions (North, 1990) that reward some channels and penalise others. The same basic logic was independently derived by Murphy et al. (1991), who showed that the allocation of talent responds to relative returns. While both the Schumpeterian and the Kirznerian frameworks are difficult to operationalise and to measure, the Baumolian framework forges an explicit link from institutions to aggregate productivity: productivity rises when institutions raise the relative payoff to productive entrepreneurship and stagnates when the rules reward predation. The rules are more tractable than the "spirit" of enterprise and the framework reconciles the available stack of entrepreneurial talent with the wide dispersion of growth outcomes.

The literature points to four critics regarding the usage of the Baumolian framework. First, it treats institutions as exogenous, thus defining productivity relative to a fixed institutional benchmark and abstracting from the evolution of standards over time (Douhan & Henrekson, 2010; Lucas & Fuller, 2017). Second, it abstracts from uncertainty and failure, assuming that entrepreneurs reliably capture the rewards their chosen channel offers (Foss & Klein, 2012). Third, the unproductive–destructive boundary is left under-defined and is frequently collapsed in practice (Desai & Acs, 2007). And fourth, the assumption of fixed supply is questionable once institutions are recognised to affect entry as well as direction. Building on the latter, entrepreneurs can act as "institution–makers" who may abide by the existing rules, evade them, or actively work to alter them in their favour (Henrekson & Sanandaji, 2011). Consequently, under second–best theory (Lipsey & Lancaster, 1956), seemingly "unproductive" or "destructive" actions can actually be welfare–improving (Douhan & Henrekson, 2010). With respect to the first critique, Acemoglu (1995) formalises the endogeneity of institutions directly, showing that reward structures can be self–reinforcing and that an economy may become trapped in a rent–seeking equilibrium from which it cannot easily escape. Building on that, Kalantaridis (2014) stresses the role of power and contestability in institutional change, while noting that the precise mechanism by which rules are transformed remains under-theorised.

With respect to our main goal and research questions, one can summarise the existing theoretical foundations into following: productive "altering" entrepreneurship can improve institutions and thereby raise the productivity ceiling, whereas unproductive altering can entrench low-productivity equilibria.

3. Data and methodology

Connecting theories to data requires a choice between two conceptions of entrepreneurship. The occupational view equates entrepreneurship with self–employment, business ownership or new-firm entry (as captured by indicators such as the Global Entrepreneurship Monitor's GEM total early–stage entrepreneurial activity rate) while the functional or behavioural view identifies it with Baumolian allocation. The literature confirms that self–employment and small–business rates are now widely regarded as poor proxies for the innovation–driven entrepreneurship that raises productivity (Henrekson & Sanandaji, 2014). However, there is no settled procedure for internationalizing Baumol's three types in the existing research. Composite constructs such as Net Entrepreneurial Productivity attempt to combine quantity and quality (Borozan et al., 2016), but without consensus.

In a nutshell, occupational indicators are widely available and internationally comparable but conflate productive and unproductive activity, while functional measures are theoretically apt but data–scarce and difficult to standardize across countries. The paper employs functional view and uses the GEM's National Entrepreneurship Context Index (NECI) as a measure of Baumolian entrepreneurship allocation. NECI is a composite indicator that summarises, in a single figure, the quality of the environment in which entrepreneurial activity takes place within a national economy. It is defined as the arithmetic mean of the scores assigned to a country's entrepreneurial framework conditions (Rietveld & Patel, 2023). Positive sign is expected for productive and negative sign for unproductive entrepreneurship. Destructive entrepreneurship is not expected and coded since the sample includes so called successful story countries of politico–economic transformation.

Table 1. *Data description and sources*

Variable	Label	Measure	Source	Expected sign
GDP per person employed	YPE	% of EU27, current prices	Eurostat	Dependent var.
GDP per hour worked	YPH	% of EU27, current prices	Eurostat	Dependent var.
Nat. Entrepreneurship Context Index	NECI	Index, [0:10]	GEM	+
Burden of gov. reg.	BGR	Index, [1:7]	WEF	−
Harmonised Index of Consumer Prices	INF	Annual avg. rate of change	Eurostat	+
Total employment (20–64)	EMPL	% of total population	Eurostat	−
Total population	POP	Persons, period average	WIIW	−
Countries' Exports to EU15	XEU15	Euro, mn	WIIW	+

Note: GEM is Global Entrepreneurship Monitor, WEF is World Economic Forum with respect to Global Competitiveness Report, and WIIW is Vienna Institute for International Economic Studies

Variable BGR – taken from the executive opinion survey of the yearly Global Competitiveness Report (WEF) – measures how burdensome it is for business to comply with governmental administrative requirements (Table 1). A BGR equal to 1 indicates that it is incredibly burdensome, and vice versa. The expected negative sign of BGR reflects that higher level of government regulation (lower value of BGR) results in a higher level of aggregate productivity. The paper employs this indicator as a measure of institutional quality.

This study includes four control variables in the model: inflation and employment rate, population and country's export to the EU15. With both dependent variables measured per person employed and per hour worked employment and population is expected to have a negative sign, while inflation a positive sign. A positive sign for variable XEU15 is expected because the economies of the new EU member states are part of the global value chains owned by the EU15 member states. Their demand actually translates into new EU member states exporting toward the old EU, comprised of EU15 member states. Time period is constrained due to data availability (WEF changed their report after Covid–19 pandemic) hence covering 2005–2019 while the sample consists of a relatively homogenous group of post-socialist countries that differ in their size, but share a common "path dependency" in the last three decades.

Using the data described above, we estimate the following relationship:

$$\begin{aligned} \mathrm{YPE}_{i,t} = \beta_0 + \beta_1 \,\mathrm{YPE}_{i,t-1} + \beta_2 \,\mathrm{XEU15}_{it} + \beta_3 \,\mathrm{POP}_{it} + \beta_4 \,\mathrm{NECI}_{it} \\ + \beta_5 \,\mathrm{BGR}_{it} + \beta_6 \,\mathrm{INF}_{it} + \beta_7 \,\mathrm{EMPL}_{it} + \varepsilon_{i,t}. \end{aligned} \tag{1}$$

The paper employs a linear dynamic panel model based on the one-step generalized method of moments (GMM) estimator proposed by Arellano & Bond (1991). The baseline dynamic model can be written as:

$$y_{it} = \gamma \, y_{i,t-1} + \mathbf{x}'_{it}\boldsymbol{\beta} + \alpha_i + \varepsilon_{it}, \quad i = 1, \ldots, N, \quad t = 1, \ldots, T, \tag{2}$$

where y_{it} is the dependent variable, $y_{i,t-1}$ is its lagged value, $\mathbf{x}_{it}$ is a vector of explanatory variables, α_i is a time–invariant country–specific effect, and ε_{it} is the error term. In this setup the dependent variable y_{it} is correlated directly with $y_{i,t-1}$ and indirectly with α_i. If we consider the OLS estimation then the error term $u_{it} = \alpha_i + \varepsilon_{it}$ is correlated with the regressor $y_{i,t-1}$,

which violates $\text{Cov}(y_{i,t-1}, u_{it}) = 0$, so OLS will not be consistent, i.e. $\text{Cov}(y_{i,t-1}, u_{it}) \neq 0$. This is different from the static random–effect model where pooled OLS approach estimate β consistently if the regressor is uncorrelated with the error term. Inconsistency is still present in the within–group estimator which eliminates the time–invariant individual effects, however the regressor $(y_{i,t-1} - \bar{y}_i)$ is correlated with the error term $(\varepsilon_{it} - \bar{\varepsilon}_i)$. Random-effect estimators which can be understood as a weighted combination of the within and between estimators are also inconsistent. Lastly, first differences OLS estimator is also inconsistent since lagged differenced dependent variable $\Delta y_{i,t-1} = y_{i,t-1} - y_{i,t-2}$ contains the $\varepsilon_{i,t-1}$ that is included in $y_{i,t-1}$, therefore $\text{Cov}(\Delta y_{i,t-1}, \Delta\varepsilon_{it}) \neq 0$ (Cameron & Trivedi, 2005).

For that reason Bond (2002) highlights that including one or more lags of the dependent variable significantly affects the consistent assessment of other parameters in the model, while Baltagi (2008) advises using dynamic panel analysis whenever the dependent variable's current value depends on its previous values. Arellano & Bond (1991) propose using the GMM estimator (instead of least squares estimators) if the model includes a lagged dependent variable, in which case the first-differences model:

$$y_{it} - y_{i,t-1} = \gamma(y_{i,t-1} - y_{i,t-2}) + (\mathbf{x}_{it} - \mathbf{x}_{i,t-1})'\boldsymbol{\beta} + (\varepsilon_{it} - \varepsilon_{i,t-1}), \quad t = 2, \ldots, T, \tag{3}$$

can be estimated using instrumental variables. According to Anderson & Hsiao (1981) a good instrument for the regressor $\Delta y_{i,t-1}$ is $y_{i,t-2}$ or $\Delta y_{i,t-2}$. They satisfy both conditions necessary for the validity of the instrument. Neither of them is correlated with the error term, $E[\Delta y_{i,t-2}\,\Delta\varepsilon_{it}] = E[y_{i,t-2}\,\Delta\varepsilon_{it}] = 0$, thereby satisfying the condition of orthogonality. However, both of them are correlated with the regressor, $E[\Delta y_{i,t-2}\,\Delta y_{i,t-1}] = E[y_{i,t-2}\,\Delta y_{i,t-1}] \neq 0$, satisfying the condition of relevance. Arellano & Bond (1991) extend this approach by using all valid lags of the dependent variable as instruments for the lagged dependent variable in the first-differenced equation. Therefore, the moment conditions can be written as:

$$E[y_{i,t-s}\,\Delta\varepsilon_{it}] = 0, \quad s \geq 2. \tag{4}$$

Thus as the number of lags grows the number of available instruments increases. Therefore, we would have more instruments than endogenous regressors so the model is overidentified and can be estimated using panel GMM (Cameron & Trivedi, 2005; Hansen, 2022).

The GMM estimator can be expressed as:

$$\hat{\boldsymbol{\theta}}_{\text{GMM}} = \left(\Delta\mathbf{X}'\mathbf{Z}\,W_n\,\mathbf{Z}'\Delta\mathbf{X}\right)^{-1}\Delta\mathbf{X}'\mathbf{Z}\,W_n\,\mathbf{Z}'\Delta\mathbf{y}; \quad \boldsymbol{\theta} = (\gamma, \boldsymbol{\beta})'. \tag{5}$$

Here $\Delta\mathbf{X}$ is the matrix of first–differenced regressors, $\Delta\mathbf{y}$ is the vector of first–differenced dependent-variable observations, $\mathbf{Z}$ is the matrix of instruments and W_n is a weighting matrix. The main advantage of Arellano–Bond estimator is that asymptotic variance of the estimated coefficients can be reduced and the stability of the estimator can be improved by using additional moment conditions. However, if we use too many instruments then we might encounter the weak instrument problem, so the number of used lags should be limited especially if T is relatively large. Additionally, the one-step Arellano–Bond estimator performs well in the small or moderate size samples when errors are approximately homoscedastic. That is because the one-step weight matrix does not depend on residuals and it is therefore less random than the two-step weight matrix (Cameron & Trivedi, 2005; Hansen, 2022).

Since the model is overidentified, the validity of instruments is tested using the Sargan or Hansen test of overidentifying restrictions. The null hypothesis is testing whether the orthogonality conditions are satisfied, where instruments are uncorrelated with the error term and that the moment conditions are correctly specified. Therefore, failure to reject its null hypothesis provides support for validity of the selected instruments, whereas rejection indicates that at least some instruments may be endogenous or that the model is incorrectly specified. Another important specification check is the Arellano–Bond test for the presence of second–order autocorrelation in the first–differenced residuals. If the second–order correlation is present then the lagged levels used as instruments are correlated with the transformed error term. This would invalidate the corresponding moment conditions and could produce biased estimates (Cameron & Trivedi, 2005; Hansen, 2022).

Both tests were conducted and the null hypothesis of the Sargan test was not rejected, indicating that the selected instruments were jointly valid. Similarly, the null hypothesis of no second-order serial correlation was not rejected, supporting the validity of the lagged instruments used in the estimation.

4. Results and discussion

This section reports summary statistics and the results of four dynamic panel models designed to identify the effect of entrepreneurship on aggregate level of productivity for 11 post–socialist new EU member states. Beyond identifying entrepreneurial and institutional factors associated with aggregate productivity, the paper evaluates the soundness of the Baumolian approach in the observed sample from 2005 till 2019.

Summary statistics is presented in Table 2 and it indicates that the mean values of aggregate measures of productivity – YPE and YPH – are approximately 2/3 of the EU average while both of our main explanatory variables – NECI and BGR – are below average levels. Control variables – EMPL, INF and XEU15 – point to expected mean values in line with a relatively smooth post-transitional period that overlapped with their successful EU accession. More importantly, all of the control variables – including POP that we used to control for various size of countries within the sample – yielded expected signs in line with the standard economic theory as evident from Table 3.

Table 2. *Descriptive statistics*

Variable	Obs	Mean	Std. Dev.	Min	Max
YPE	165	68.22	12.31	36.6	87.9
YPH	165	61.48	12.02	32.7	84.2
NECI	94	4.37	0.36	3.45	5.41
BGR	165	2.95	0.55	1.9	4.47
EMPL	121	68.59	6.16	53.9	80.5
INF	165	2.79	2.66	-1.6	15.3
POP	165	9.46	10.48	1.31	38.18
XEU15	165	28.53	31.76	1.79	148.41

Source: authors' calculation.

Table 3 documents the result of the conducted empirical exercise and provides answers to our research questions. First, entrepreneurial activity is confirmed to have a statistically significant correlation with both measures of aggregate productivity. The environment in which entrepreneurial activity takes place has a positive effect on the level of GDP per employed and per hour worked. In addition to that, our measure of institutions – burden of government regulation – is also significantly correlated with aggregate productivity with an expected negative sign. The role of the government is often contra-intuitive to the needs and wants of entrepreneurs and its second-best public policies (Lipsey & Lancaster, 1956) are often viewed as burdensome if one takes an individual as opposed to socially maximizing approach. Nonetheless, the chosen sample of countries guarantees a sound institutional framework under the EU umbrella. Estrin et al. (2013) demonstrate across a large set of (transition) countries that institutional quality shapes not merely the rate of entrepreneurship but entrepreneurial growth aspirations – the margin most relevant to productivity. As observed from Table 2 all measures of productivity and entrepreneurship were within first three quartiles of distribution which is in line with Borozan et al. (2016) who report that Net Entrepreneurial Productivity is systematically lower in post-transition than in developed economies, consistent with an institution-driven account of the allocation of talent.

Table 3. *Results of the panel model estimation*

	Model 1 (YPE)	Model 2 (YPE)	Model 3 (YPH)	Model 4 (YPH)
L.YPE	0.81***	0.71***		
	(0.06)	(0.08)		
L.YPH			0.75***	0.65***
			(0.06)	(0.09)
POP	−6.70171***	−16.14461***	−5.48024***	−11.32332***
	(1.71101)	(4.47089)	(1.56159)	(4.05028)
XEU15	0.03*	0.06**	0.03*	0.05**
	(0.02)	(0.02)	(0.02)	(0.02)
INF	0.28***	0.29***	0.20**	0.22**
	(0.10)	(0.11)	(0.09)	(0.11)
EMPL	−0.08	−0.27***	−0.03	−0.17**
	(0.05)	(0.08)	(0.05)	(0.07)
BGR		−2.45***		−2.77***
		(0.82)		(0.81)
NECI		2.24**		2.30**
		(0.95)		(0.96)
Constant	80.81***	178.71***	68.18***	131.38***
	(19.56)	(45.36)	(17.76)	(40.32)
Sargan test	122.2	58.7	127.1	60.7
χ^2	482.07	190.61	396.46	114.63
z-rank	111	69	111	69

Note: ***, ** and * indicate significance at 1%, 5% and 10% level (standard errors in parentheses).
Source: authors' calculation.

The results also enabled us to successfully distinguish between Baumol's (1990) productive and unproductive entrepreneurial activities in our sample – an answer to our second research question. A positive sign points to the productive entrepreneurship which clearly adds to the existing literature. The canonical empirical test of the Baumolian thesis is So-

bel (2008), who shows for US states that higher institutional quality is associated with more productive and less unproductive entrepreneurship. On cross-country samples, Bowen & De Clercq (2008) find that the institutional context shapes the allocation of entrepreneurial effort towards high-growth activity, while Stenholm et al. (2013) show that institutional arrangements influence both the rate and the type of entrepreneurial activity. Levie & Autio (2008), testing the GEM model, confirm that institutional conditions are an important determinant of entrepreneurial entry. The pattern is consistent: where entrepreneurship is measured in a way that captures its productive component, the institutional channel to productivity is visible.

Although our dependent variables were focused at productivity, the results are in line with studies that looked at the standard measures of economic success. Bosma et al. (2018) document for a panel of European countries and regions that institutional quality, operating through productive entrepreneurship, positively affects growth in GDP per capita. Earlier European evidence in Carree & Thurik (1998) linked small–firm and entrepreneurial activity to growth across EU economies. To sum it all up, the European evidence converges on a qualified endorsement of the Baumolian–institutional account: institutions shape the type (productive versus unproductive) of entrepreneurship. Through the productive component they influence aggregate productivity. As the systematic review by Aeeni et al. (2019) documents, the literature remains dominated by macro, country–level analyses, with scarce evidence at the individual and within-industry levels. Also, as a necessary caveat one needs to emphasise that although institutions plausibly affect growth through entrepreneurship, the direction of causality and the specific institutional channels at work remain open questions (Urbano et al., 2019).

5. Conclusion

The epigraph that opens this paper – a musician who has "found a good band" and "just wants to play" – captures the intrinsic impulse that animates much of the entrepreneurial activity. Yet, as the analysis argues, whether such "playing" raises a society's productivity depends less on the impulse itself than on the institutional stage on which it is performed. With respect to the available entrepreneurial talent it is the relative payoff that prevailing rules attach to productive as opposed to unproductive activity that matters. The contribution of starting a band or a firm to aggregate productivity is therefore conditional on the incentives that channel that effort.

Estimating a dynamic panel for eleven post-socialist new EU member states between 2005 and 2019, the paper documents an affirmative answer to the first research question: the quality of the entrepreneurial environment, captured by NECI, is significantly associated with both GDP per person employed and GDP per hour worked. The sign of that association answers the second research question: it is positive, indicating that the entrepreneurship prevailing in these economies is productive in Baumol's sense, while a heavier burden of government regulation is, as expected, negatively associated with productivity.

This paper contributes to the literature in two respects. Conceptually, it uses a composite indicator of entrepreneurial framework conditions as a proxy for the institutional allocation of entrepreneurial effort hence building a theory to measurement bridge that renders the Baumolian framework operational. Empirically, it adds panel evidence from a relatively homogeneous group of new EU member states, complementing the existing studies.

Several limitations temper these conclusions. The results are associational rather than causal and NECI is an imperfect proxy for Baumolian allocation. The sample period, constrained by data availability, ends before the disruptions of the subsequent years and a macro panel cannot capture the within-country and within-industry heterogeneity that might yield interesting scientific and public policy insights.

Future research could draw on firmer identification strategies and on disaggregated, individual– and industry–level data to separate productive from unproductive entrepreneurship more sharply. An interesting avenue might look at a possible confirmation of whether the relationship is stable across the business cycle in the longer time period at this level of aggregation. For economic policy, the results reinforce a familiar message since raising aggregate productivity is less a matter of stimulating the quantity of entrepreneurship. The only game in town is improving the institutional environment in which entrepreneurship takes place: strengthening the framework conditions that tilt the relative payoff toward productive activity.

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References

Acemoglu, D. (1995). Reward structures and the allocation of talent. *European Economic Review*, 39(1), 17–33. doi: 10.1016/0014-2921(94)00014-Q

Aeeni, Z., Motavaseli, M., Sakhdari, K. & Mobini Dehkordi, A. (2019). Baumol's theory of entrepreneurial allocation: A systematic review and research agenda. *European Research on Management and Business Economics*, 25(1), 30–37. doi: 10.1016/j.iedeen.2018.09.001

Aghion, P. & Howitt, P. (1992). A model of growth through creative destruction. *Econometrica*, 60(2), 323–351. doi: 10.2307/2951599

Anderson, T. W. & Hsiao, C. (1981). Estimation of dynamic models with error components. *Journal of the American Statistical Association*, 76(375), 598–606. doi: 10.1080/01621459.1981.10477691

Arellano, M. & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and application to employment equations. *Review of Economic Studies*, 58(2), 277–297. doi: 10.2307/2297968

Baltagi, B. H. (2008). *Econometric Analysis of Panel Data*. West Sussex: John Wiley & Sons.

Baumol, W. J. (1990). Entrepreneurship: Productive, unproductive, and destructive. *Journal of Political Economy*, 98(5), 893–921. doi: 10.1086/261712

Bond, S. R. (2002). Dynamic panel data models: A guide to micro data methods and practice. *Portuguese Economic Journal*, 1(2), 141–162. doi: 10.1007/s10258-002-0009-9

Borozan, D., Arnerić, J. & Ćorić, I. (2016). A comparative study of net entrepreneurial productivity in developed and post–transition economies. *International Entrepreneurship and Management Journal*, 13(3), 855–880. doi: 10.1007/s11365-016-0427-2

Bosma, N., Sanders, M. & Stam, E. (2018). Institutions, entrepreneurship, and economic growth in Europe. *Small Business Economics*, 51(2), 483–499. doi: 10.1007/s11187-018-0012-x

Bowen, H. P. & De Clercq, D. (2008). Institutional context and the allocation of entrepreneurial effort. *Journal of International Business Studies*, 39(4), 747–767. doi: 10.1057/palgrave.jibs.8400343

Braunerhjelm, P., Acs, Z. J., Audretsch, D. B. & Carlsson, B. (2010). The missing link: Knowledge diffusion and entrepreneurship in endogenous growth. *Small Business Economics*, 34(2), 105–125. doi: 10.1007/s11187-009-9235-1

Cameron, A. C. & Trivedi, P. K. (2005). *Microeconometrics: Methods and Applications*. Cambridge University Press.

Carree, M. A. & Thurik, A. R. (1998). Small firms and economic growth in Europe. *Atlantic Economic Journal*, 26(2), 137–146. doi: 10.1007/BF02299356

Desai, S. & Acs, Z. J. (2007). *A theory of destructive entrepreneurship* (Jena Economic Research Papers No. 2007-085). Friedrich Schiller University Jena. doi: 10.2139/ssrn.1029648

Douhan, R. & Henrekson, M. (2010). Entrepreneurship and second-best institutions: Going beyond Baumol's typology. *Journal of Evolutionary Economics*, 20(4), 629–643. doi: 10.1007/s00191-010-0174-4

Eckhardt, J. T. & Shane, S. A. (2003). Opportunities and entrepreneurship. *Journal of Management*, 29(3), 333–349. doi: 10.1016/S0149-2063(02)00225-8

Estrin, S., Korosteleva, J. & Mickiewicz, T. (2013). Which institutions encourage entrepreneurial growth aspirations? *Journal of Business Venturing*, 28(4), 564–580. doi: 10.1016/j.jbusvent.2012.05.001

Foss, N. J. & Klein, P. G. (2012). *Organizing Entrepreneurial Judgment: A New Approach to the Firm*. Cambridge University Press.

Hansen, B. E. (2022). *Econometrics*. Princeton University Press.

Henrekson, M., Johansson, D. & Karlsson, J. (2024). To be or not to be: The entrepreneur in neo-Schumpeterian growth theory. *Entrepreneurship Theory and Practice*, 48(1), 104–140. doi: 10.1177/10422587221141679

Henrekson, M. & Sanandaji, T. (2011). The interaction of entrepreneurship and institutions. *Journal of Institutional Economics*, 7(1), 47–75. doi: 10.1017/S1744137410000342

Henrekson, M. & Sanandaji, T. (2014). Small business activity does not measure entrepreneurship. *Proceedings of the National Academy of Sciences*, 111(5), 1760–1765. doi: 10.1073/pnas.1307204111

Jakee, K. & Spong, H. (2003). Praxeology, entrepreneurship and the market process: A review of Kirzner's contribution. *Journal of the History of Economic Thought*, 25(4), 461–486. doi: 10.1080/1042771032000147515

Kalantaridis, C. (2014). Institutional change in the Schumpeterian–Baumolian construct: Power, contestability and evolving entrepreneurial interests. *Entrepreneurship & Regional Development*, 26(1–2), 1–22. doi: 10.1080/08985626.2013.840338

Kirzner, I. M. (1973). *Competition and Entrepreneurship*. University of Chicago Press.

Kirzner, I. M. (2009). The alert and creative entrepreneur: A clarification. *Small Business Economics*, 32(2), 145–152. doi: 10.1007/s11187-008-9153-7

Levie, J. & Autio, E. (2008). A theoretical grounding and test of the GEM model. *Small Business Economics*, 31(3), 235–263. doi: 10.1007/s11187-008-9136-8

Lipsey, R. G. & Lancaster, K. (1956). The general theory of second best. *The Review of Economic Studies*, 24(1), 11–32. doi: 10.2307/2296233

Lucas, D. S. & Fuller, C. S. (2017). Entrepreneurship: Productive, unproductive, and destructive – Relative to what? *Journal of Business Venturing Insights*, 7, 45–49. doi: 10.1016/j.jbvi.2017.03.001

Murphy, K. M., Shleifer, A. & Vishny, R. W. (1991). The allocation of talent: Implications for growth. *The Quarterly Journal of Economics*, 106(2), 503–530. doi: 10.2307/2937945

North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.

Rietveld, C. A. & Patel, P. C. (2023). A critical assessment of the National Expert Survey data of the Global Entrepreneurship Monitor. *Entrepreneurship Theory and Practice*. doi: 10.1177/10422587221134928

Schumpeter, J. A. (1934). *The Theory of Economic Development*. Harvard University Press.

Schumpeter, J. A. (1942). *Capitalism, Socialism and Democracy*. Harper & Brothers.

Shane, S. & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217–226. doi: 10.5465/amr.2000.2791611

Sobel, R. S. (2008). Testing Baumol: Institutional quality and the productivity of entrepreneurship. *Journal of Business Venturing*, 23(6), 641–655. doi: 10.1016/j.jbusvent.2008.01.004

Stenholm, P., Acs, Z. J. & Wuebker, R. (2013). Exploring country-level institutional arrangements on the rate and type of entrepreneurial activity. *Journal of Business Venturing*, 28(1), 176–193. doi: 10.1016/j.jbusvent.2011.11.002

Urbano, D., Aparicio, S. & Audretsch, D. (2019). Twenty-five years of research on institutions, entrepreneurship, and economic growth: What has been learned? *Small Business Economics*, 53(1), 21–49. doi: 10.1007/s11187-018-0038-0

WIIW Annual Database (2024). *The Vienna Institute for International Economic Studies*. https://data.wiiw.ac.at/annual-database.html. [accessed December 9, 2024].

Poduzetništvo i agregatna produktivnost

SAŽETAK

Rad istražuje doprinos poduzetničke aktivnosti agregatnoj produktivnosti u jedanaest novih postsocijalističkih država članica Europske unije u razdoblju od 2005. do 2019. godine. Oslanjajući se na Baumolovo razlikovanje produktivnoga i neproduktivnoga poduzetništva, rad razmatra dva pitanja: jesu li mjere poduzetničke aktivnosti korelirane s agregatnom produktivnošću te je li ta korelacija pozitivna ili negativna, čime se omogućuje empirijsko razlikovanje produktivnoga i neproduktivnoga poduzetništva. Produktivnost se mjeri BDP–om po zaposlenoj osobi i BDP-om po satu rada, poduzetnička aktivnost indeksom nacionalnoga poduzetničkog konteksta NECI (engl. *National Entrepreneurship Context Index*) iz baze GEM (engl. *Global Entrepreneurship Monitora*), a institucionalno okruženje opterećenjem državnom regulacijom BGR (engl. *Burden of Government Regulation*). Procjenjujući linearni dinamički panel model, analiza pokazuje da je poduzetničko okruženje pozitivno i statistički značajno povezano s objema mjerama produktivnosti, dok je veće regulatorno opterećenje s njima negativno povezano. Dobiveni rezultati prevladavajuće poduzetništvo u uzorku identificiraju kao produktivno u Baumolovu smislu. Doprinos rada je dvojak: na konceptualnoj razini rad nudi most između teorije i mjerenja potrebnih za utvrđivanje postojanja Baumolovog okvira, a na empirijskoj razini dokumentira vezu između poduzetništva i produktivnosti na panelu novih država članica EU–a.

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