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Small but beautiful? Economic impacts of the size of nations in the European Union

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**Small but Beautiful?
Economic Impacts of the Size of Nations
in the European Union**

Jörg König and Renate Ohr

GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN

Small but Beautiful?

Economic Impacts of the Size of Nations in the European Union

Jörg König and Renate Ohr*

Abstract

This paper highlights the economic meaning of the size of the state for members of the European Union, thereby making the economic success of EU states statistically tangible. Firstly, we show in descriptive illustrations that the theoretically expected characteristics of small countries clearly apply to the current EU states. From the theoretical perspective, only the bivariate relationship between the population size and the economic growth initially depicts an unexpected sign. However, the econometric analysis performed on our panel data set confirms the assumption that this relationship is strongly influenced by factors other than population size, such as the duration of EU membership, the level of economic development (transformation process) and the increased development potential provided by EU funds. When subtracting these effects through appropriate statistical methods, there is an overall significant positive dependence of economic growth on the size of the state.

Keywords: European Union, economic integration, small open economy, size of nations, economic growth, panel data.

JEL: C23, F15, F43, O52

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1. Introduction

In the past 2 decades, the European continent has witnessed a substantial increase in sovereign states, which has brought forth numerous small countries. Especially since the dissolution of the Soviet Union and the Warsaw Pact, over a dozen new states have been created. Meanwhile, the number of countries in the European Community has more than doubled from 12 to 27 members. It is thereby noteworthy that in the last enlargement rounds, mainly small states were accepted into the European Union (EU). To put it more precisely, only 1 country (Poland) out of 15 new member states since 1995 is not defined as being a European “small state”.¹ In total, there are 21 small states in the current form of the European Union (also referred to as the EU-27), and their numbers could even grow to 23 with the potential accession of Iceland and Croatia.

This large amount of small states in the EU raises the question of whether EU membership represents any special benefits (economic, political or social) for small countries. The article at hand aims at investigating this question in the context of ever-deepening EU integration in order to highlight subsequently the meaning of the size of an EU member state for its economic success.

For this purpose, we must first define the size of a state and the determinants that can be used to measure it. A theoretical illustration of the economic implications of a smaller state size clearly shows the main characteristics of a small country, thereby visualizing the eventual advantages of EU membership. Based on this theoretical approach, we will analyze various economic indicators from the Eurostat database as well as responses from Eurobarometer surveys in order to derive trend forecasts for the benefits of EU membership for small states. Lastly, an econometric analysis – with the help of a panel data set – will measure and present a differentiated and conclusive evaluation of the influence and the statistical significance of the size of a state on the country’s economic success.²

2. Definition and Measurement of the Size of a State

In economics, different criteria are used to define the size of a state, one of them being the macroeconomic concept of a “small open economy.” A country is thus defined as small when its international trade and politics cannot influence the price, interest rates or production levels in the world market. Thus, these countries act as price-takers. On the other hand, large states enjoy as price-setters the power to influence the world market, thereby determining their own terms of trade. However, the problem with this definition is that no all-embracing price-setter exists in the EU. Such tendencies can only be identified in certain sectors at most, but not across the board.

¹ A detailed definition of the state size, as well as a classification of small and large EU member states, can be found in the following section.

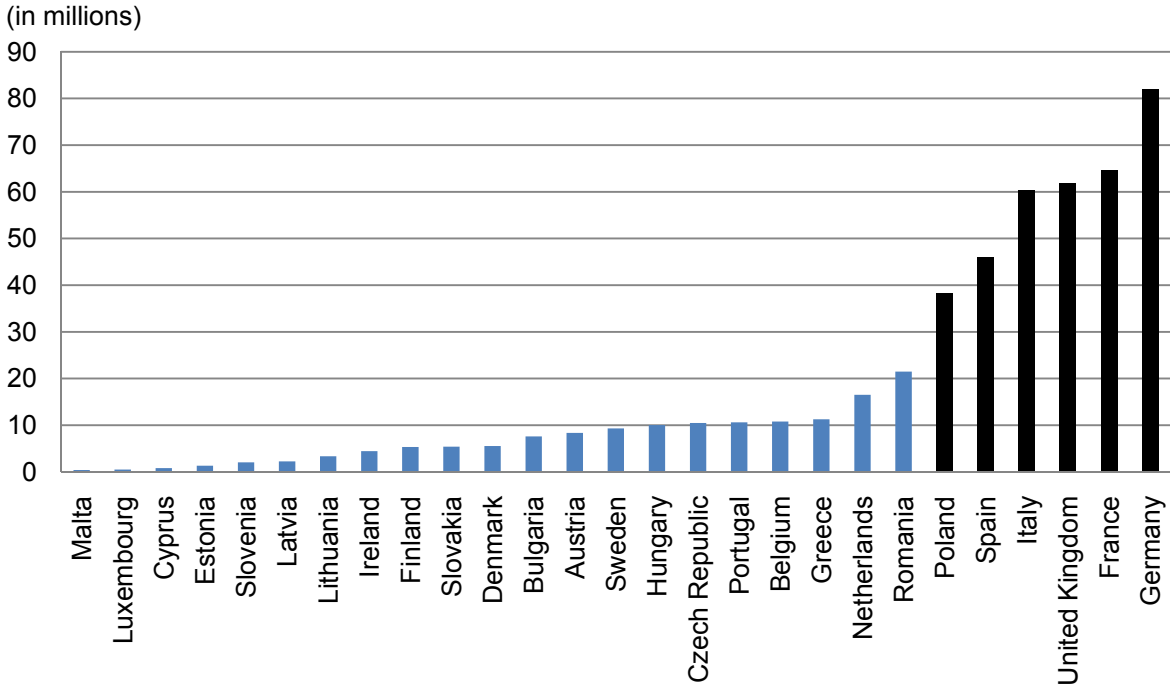
² For a broader and more general view of the economic impact on the size of nations see Robinson (1960).

Another way to define the size of a state is through the application of a single indicator, such as the surface area of the country (which represents the national resource availability) or its GDP (which measures domestic economic strength). However, in most economic literature and econometric studies, the country's population size is the parameter most used to determine the state size.³

Jalan (1982) identifies and classifies the size of a state by aggregating certain indicators (population, country area and GDP). By using such a composite indicator, the individual weighting of each indicator needs to be applied with caution. Regarding Finland, for example, one could easily imagine how the ranking order of the EU members would change if for instance a higher weight was assigned to the country area than to the population size or the GDP. Jalan, however, applies the same weight to each value, without any justification. Downes (1988) tries to correct this discrepancy through a principal component analysis. However, his choice of indicators, which ultimately influences this statistical method of weighting, is still subjective.

Due to this background, a single indicator, especially population size, seems to be more suitable for defining the size of a state. Lloyd/Sundrum (1982) state that there are several advantages to using population size. Besides not having the weighting problem and the availability of easily accessible data, population size serves as a good proxy for two economic variables: the domestic market size and the potential labor force. The use of a single indicator also facilitates the interpretation of statistical analysis, as performed in the subsequent sections of this paper.

Figure 1: Population size in the EU-27 (2010)



Source: Eurostat, own representation.

³ See e.g. Kuznets (1960), Chenery (1960), Armstrong/Read (1998), Alesina et al. (2005) and Rose (2006).

For these reasons, in this paper we shall henceforth classify the size of each EU member state by its population size. Figure 1 shows how the population increases gradually from Malta to Germany, with the largest leap in population size between Romania (21.4 million) and Poland (38.2 million). This is where we draw the line between “small” and “large” EU states.⁴ Thus, two distinct groups are formed within the European Union: a group of 21 small countries with a total population of roughly 150 million, as opposed to a group of 6 large countries with an overall population of around 350 million.

3. Theoretical Economic Implications of a Smaller State Size

In the following section, we shall briefly present the main characteristics of a small state, in order to assess any possible advantages of EU membership for these countries afterwards.

3.1. Characteristics of Small States

3.1.1. Limited Resources

Due to its small population size, a small state distinguishes itself by its limited labor force. Accordingly, Ward (1975) implies that small countries possess a smaller range of special skilled labor compared with their large counterparts. In addition, Milner/Westaway (1993) identify potential staff shortages, which may occur during the restructuring process of production if only a limited number of special skilled workers are available among the existing labor units. Armstrong/Read (1998) also point out that specialization in labor-intensive products is harder in countries with a small population. It should be noted that this is more likely to happen when a country is not only facing an absolute labor shortage, but also one relative to its capital stock. However, if the overall economic capital intensity is low, i.e. the capital availability is lower than the potential labor force, specialization in labor-intensive products would still be possible even when lacking special skilled workers (due to low labor units).

Both Kuznets (1960) and Knox (1967) also identify that if a state is restricted by a small (territorial) area, there is often a scarcity in natural resources, which may affect the diversification possibilities in production and exports. Furthermore, even when a country possesses vast territories, but has a low population, it is unlikely that there would be enough capital available to exploit the natural resources. The government would then need to attract enough foreign capital (i.e. in the form of foreign direct investments) to balance its low domestic capital reserves. However, Milner/Westaway (1993) indicate that foreign countries would be hesitant to invest in such small states, since it is assumed that there are limited market opportunities due to low domestic demand. A further negative effect can be caused by the brain drain, which occurs when

⁴ If a third category were to be included, the Netherlands and Romania would fall into this “middle” group.

there is a lack of investment in the domestic high-skilled sectors (such as research and development).

3.1.2. Small Domestic Market

A small domestic market and demand limit the production of positive (internal and external) economies of scale, usually accomplished by large companies and industries. Alesina/Spolaore (2003) observe that producers in these countries are confronted with relatively high unit prices, which may raise the final sales price. The low number of firms in the industry also limits competition and the efficient allocation of resources. Briguglio (1998) mentions that monopolies and oligopolies may arise in this case, which would further hinder innovation.

Furthermore, Alesina/Wacziarg (1998) note that small countries tend to have high levels of government consumption, since certain specific government expenditures occur in both small and large states. However, there are fewer taxpayers in small countries to bear the burden of financing government expenditures. Armstrong/Read (1998) state that this relatively high level of spending in the public sector is often countered by economies of scope. Public employees in these countries must often perform multiple tasks in order to reduce personnel costs. This may be related to a loss of quality of the public goods provided by a small state.

3.1.3. Large Openness to Foreign Trade

Small countries are often overexposed to foreign trade due to their limited resources and small domestic market, and thus depend largely on imported consumer goods, raw materials and intermediate inputs. In order to finance such high import ratios, an appropriate share of the GDP needs to be exported. Selwyn (1975) assesses that high import and export ratios naturally require an accompanying free trade policy, which in turn limits any policy adjustments for import substitution and the protection of infant industries.

Yet, small states benefit from the fact that their foreign trade activities do not affect world market prices, in such a way that they can arbitrarily increase their exports without causing any price drops. However, their large degree of openness, dependence on imports, high foreign exchange demand and high export ratios increase their vulnerability to exogenous shocks, as econometrically demonstrated by Furceri/Karras (2007). Additionally, small states have only a few specific trade partners, due to their less diversified domestic production. This also induces a certain degree of trade dependence on their target export partners.⁵ Overall, a high degree of openness is on the one hand associated with greater competition, which promotes and develops efficiency. On the other hand, these positive effects can be mitigated by increased vulnerability due to exogenous shocks.

⁵ See Kuznets (1960).

3.1.4. Weak International Negotiation Power

Small countries have weak international negotiation power due to their low economic and political relevance in international affairs. This weakness could lead to the danger of them being exposed to foreign (military) aggression, although Alesina et al. (2005) show that it is possible for small countries to join certain alliances for protection, in which they compensate their larger partners for these services. However, this “protection fee” could lead to overdependence, which eventually levels out the benefits. Furthermore, small states themselves do not hold much influence in world trade (i.e. in the World Trade Organization, WTO). Compromises between coalitions with major countries (G-20, G-33) or with other small states (ACP-states, G-90) are therefore unavoidable. Here, small countries are able to strengthen their own weak international negotiation power in order to consolidate their national interests internationally.

3.2. Expected Benefits from Membership of the European Union

Most of all, the characteristics of small states also apply specifically to small European countries, which expect an improvement in their situation as a result of EU membership and full access to the European single market. Specifically, the four “basic freedoms” embedded in the concept of a common market promise positive welfare effects.⁶

From an economic perspective, the four basic freedoms serve to make the efficient allocation of resources possible – to shift goods, services and production factors such as labor and capital to where they are most beneficial. Comparative static integration effects through trade creation are the results of the reduction in trade and transaction costs (tariff and non-tariff barriers and the associated costs). Since especially small states are overexposed to foreign trade, their production increases, and together with the decrease in the prices of consumer goods (through the elimination of customs duties), they experience a positive effect on their general welfare. Access to a large single market also helps to reduce the small countries’ dependence on their former trade partners, which in turn reduces their vulnerability to external shocks.

Because of an expanded market, small countries with low domestic demand capacity can now increase their sales volumes. This change results in dynamic integration effects, where small countries can better reap the advantages of economic specialization and positive economies of scale are no longer limited by a small national domestic market. Small member states have the option to optimize efficiency in their market structures, which leads to a further decrease in consumer goods prices. The increased competition forces further development of new production methods and allows an increase in product variety. Overall, technical progress is promoted, and general economic growth is thus strengthened.

⁶ See hereafter Ohr/Gruber (2001), p. 16ff. For the impact of the accession of small states on the European Monetary Union (EMU), see also Ohr/Özalbayrak (forthcoming).

As a member of the European single market, a much larger pool of labor force and capital reserves is available for small states through free capital and labor mobility. The previous lack of resources can now be compensated for by the other European partner countries, generating further growth in production as a result. The freedom of establishment contained in the fundamental freedom of labor mobility also promotes foreign direct investments, which are of great importance for the construction and development of national industrial structures in small countries. Usually, a transfer of technologies also occurs while attracting foreign direct investments, which may result in positive effects for small countries.⁷

Furthermore, a country's own negotiation power in international politics generally increases after joining a regional trade agreement.⁸ Entering international trade talks in a large coalition (i.e. the EU through its trade commissioner in the WTO trade talks) is associated with greater influence and weight than the solo entry of a small state. Inconvenient coalitions and unfair compromises can thus be reduced for small countries. In addition, their economic and political influence within Europe and its integration policy design increase. Unlike other small European states outside the European Union, which cannot escape from many of the EU developments, small member states have at least some opportunity to help determine the rules of the EU and to shape it according to their national needs. Small countries can explicitly gain political influence in the European Council of Ministers or in the European Parliament through their disproportionately large voting weights. They are able to present, and partially carry out, their national interests better on the European stage, which would otherwise be impossible without having joined the European Union.

4. Descriptive Analysis of a Smaller State Size in the European Union

In this section, we shall examine the theory behind the economic implications of small states and their general economic expectations from EU membership, using specific economic indicators and surveys. For this purpose, we shall present some illustrations based on Rose (2006) and Damijan (2001), which depict a statistical relationship between the population size of EU states and a specific variable using a regression line. These bivariate relationships represent a cross-sectional analysis of countries for a given time. The corresponding annual value of each state is represented by the dots around the regression line on the figures. Our research will encompass the years between 1995 and 2008 (at first only the key figures in 1995 and 2008 will be observed) for the current EU-27 member states.⁹ Luxembourg will not be included in our observation, since its GDP levels are highly influenced by its volume of commuters from abroad, and would thus

⁷ See De Mello (1999).

⁸ See Fernandez (1997).

⁹ Although data is available for the year 2009, they were not included in the analysis, since these data show substantial changes in various figures, which might be affected due to the global financial crisis of the late 2000s, and are therefore treated as outliers.

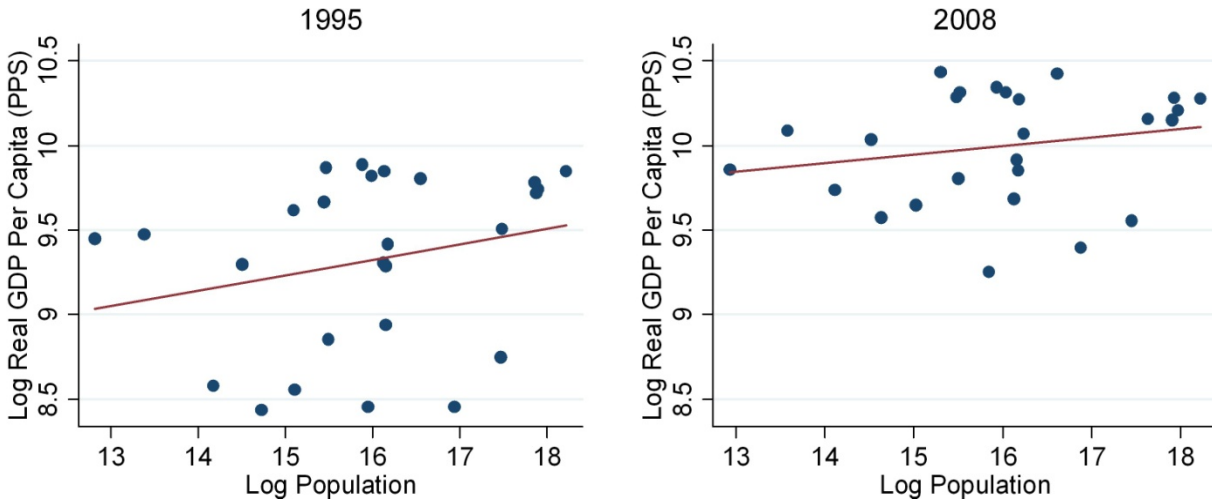
distort the results. The data are collected from Eurostat and UNCTAD, and will be reproduced in the analysis with the help of natural logarithms (ln).

In the second step of the analysis, we shall focus on the economic development of small states in the EU. A bivariate relationship between the population size and a specific variable (economic growth) will be considered, which will be supplemented with the results of various surveys.

4.1. Various Bivariate Relationships with the Size of Nations

As mentioned before, a primary characteristic of small states is the presence of a small domestic market. When considering their inefficient resource allocation and the relatively high unit labor costs, we may argue that small countries tend to exhibit lower production output per capita than their larger counterparts. Figure 2 depicts the relationship between population size and real GDP per capita, measured in purchasing power standards (PPS). For 1995, the positive slope of the regression line shows that small states tend to have a lower income per capita than larger states. When compared with 2008, the higher lying regression line suggests an overall increase in the average income per capita for all EU members. The slope in 2008 ($\beta = 0.05$) is a little lower than that in 1995 ($\beta = 0.09$).¹⁰ However, as the dots are scattered more closely around the now less steep regression line, this might point to a convergence process with regard to economic development for that period. A more detailed analysis of this assumption will be carried out in the last section of this paper.

Figure 2: Are small states less productive?

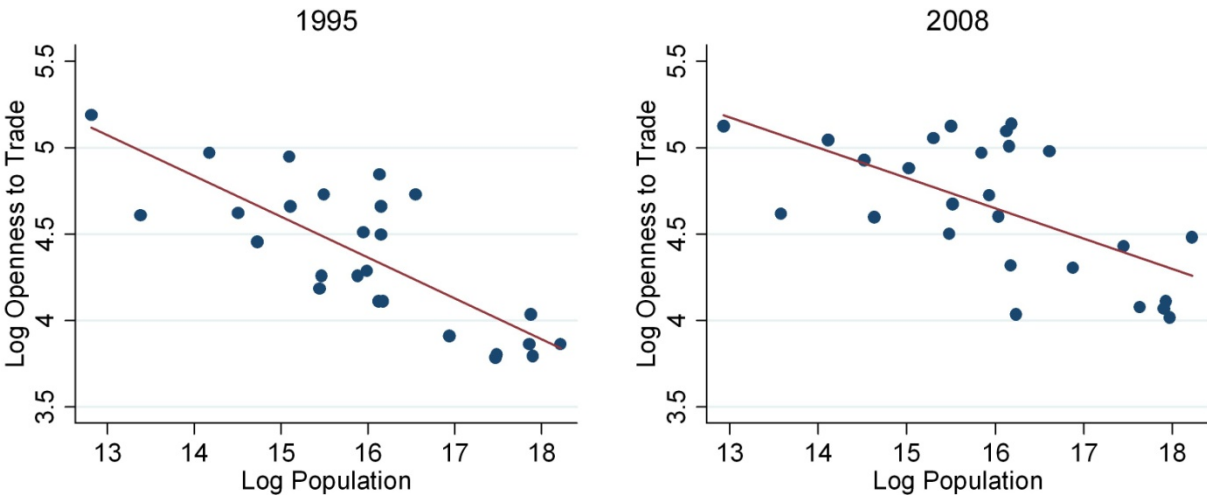


Source: Eurostat, own calculations.

¹⁰ A positive statistically significant relationship at the 1% significance level ($\beta = 0.73$) results over the entire period of 1995 to 2008.

Small states tend to have a higher import demand as a result of their less diverse production possibilities and limited factor endowments. This generally implies greater openness to trade, in order to finance these imports through the necessary exports. Figure 3 illustrates the relationship between the population size and the sum of a country's imports and exports in relation to its GDP. In 1995, we can identify a significant negative slope of the regression line ($\beta = -0.24$). Thus, small states distinguish themselves as being much more open to foreign trade than large countries. This tendency is lower in 2008 ($\beta = -0.18$); nevertheless, it is clearly shown that openness to trade tends to decrease with increasing population size.¹¹

Figure 3: Are small states more open to foreign trade?



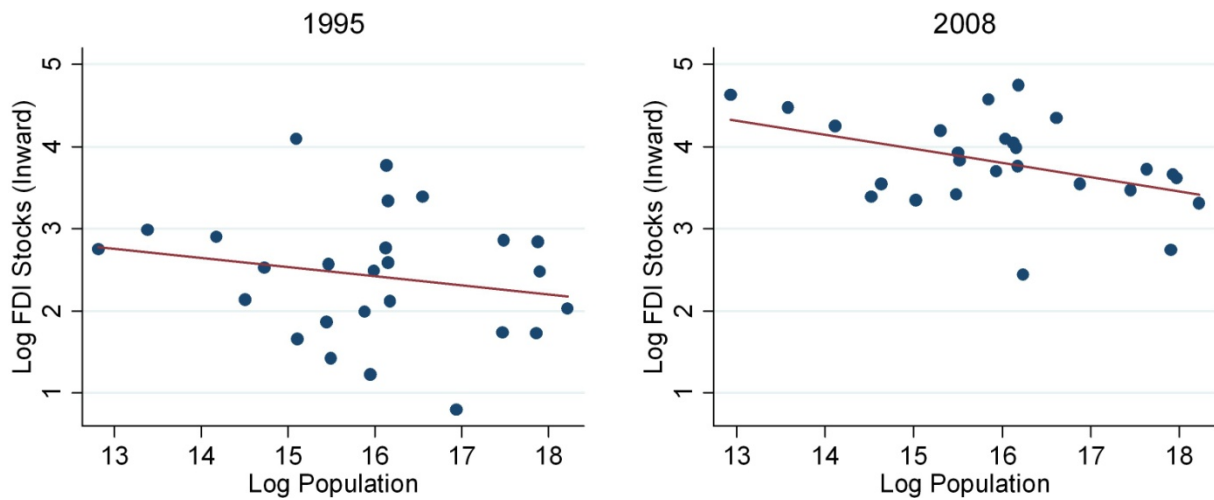
Source: Eurostat, own calculations.

The limited resources in a small country not only imply a lower potential labor force, but also a lower savings capacity and thus a lower capital stock. Small states are hereby highly dependent on foreign capital when investment rates need to be raised. If the returns on investment are expected to be beneficial to foreign investors (which should be a reasonable assumption with regard to existing or anticipated EU membership), they should result in high attraction of foreign capital in small states. Figure 4 confirms this assumption, and measures the relationship between the population size and the stock of foreign direct investment (FDI) at home (in relation to GDP). A negative relationship is already at hand in 1995 ($\beta = -0.11$), and this trend is further strengthened in 2008 ($\beta = -0.17$). The scatter points are now much closer to the regression line and the levels of investment rates are considerably higher.¹²

¹¹ A negative statistically significant relationship at the 1% significance level ($\beta = -0.20$) results over the entire period of 1995 to 2008.

¹² A negative statistically significant relationship at the 1% significance level ($\beta = -0.16$) results over the entire period of 1995 to 2008.

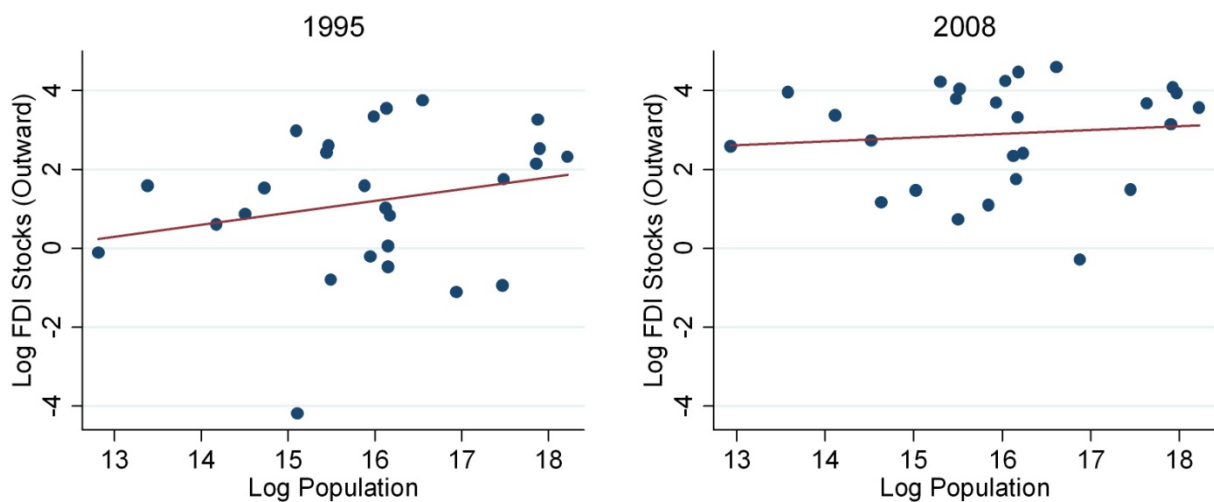
Figure 4: Do small states attract more foreign capital?



Source: Eurostat, UNCTAD, own calculations.

While a higher inflow of direct investment (in relation to GDP) is expected in small countries, higher direct investment outflows (in relation to GDP) are more common in large states. Figure 5 illustrates this theory, where 1995 ($\beta = 0.31$) shows this positive correlation more clearly than in 2008 ($\beta = 0.10$). Over time, the overall level of direct investments increases; small states now have higher FDI stocks abroad, and thus the scatter dots lie closer to the regression line.¹³ The higher rate of foreign investment once again implies a convergence of economies in these areas.

Figure 5: Do small states export less capital?



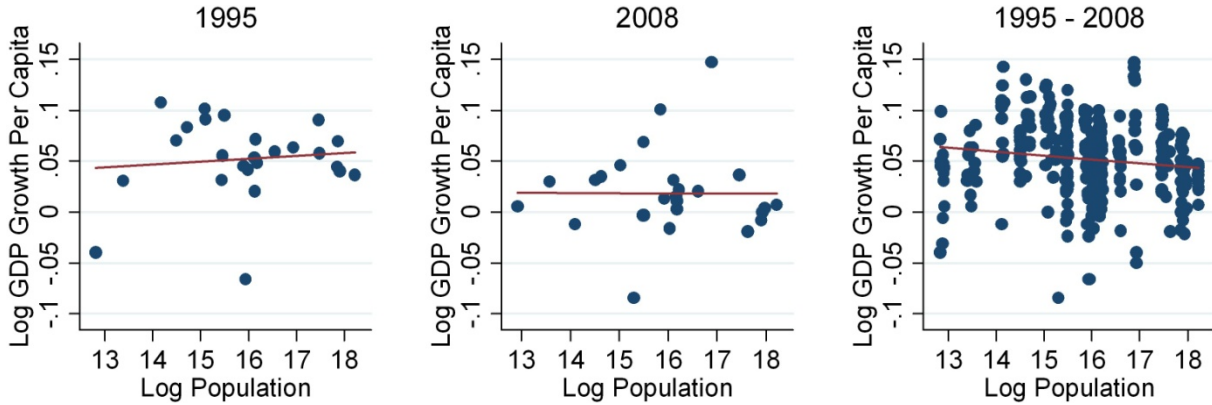
Source: Eurostat, UNCTAD, own calculations.

¹³ A positive statistically significant relationship at the 1% significance level ($\beta = 0.21$) results over the entire period of 1995 to 2008.

4.2. Economic Growth and the Size of Nations

When considering economic growth, small countries should show lower growth rates than their larger partners, due to their small (and inefficient) domestic markets, their limited labor force potential and their low domestic capital reserves. The bivariate relationship between the population size and the economic growth should thus be positive. The presentation of the annual real GDP per capita growth rate (measured in PPS) in Figure 6 shows this slightly positive relationship in 1995. In 2008, however, this positive trend becomes almost neutral, and if we observe the overall growth rates between 1995 and 2008, this relationship turns out to be negative ($\beta = -0.004$) and statistically significant.¹⁴

Figure 6: Do small states grow economically faster?



Source: Eurostat, own calculations.

Therefore, within this period there must have been positive developments in small states. The expected unidirectional relationship between population size and economic growth seems to be reversed. When taking a closer look at the data, we notice that seven of the ten smallest states only recently joined the European Union, in 2004. The economically weak new member states have experienced an economic “catching-up” process over time, which might be fostered through their potential and finally full membership of the EU. This agrees with the observation that five of the six largest EU countries had already joined the union far ahead, in 1995. If EU membership indeed causes a convergence of economies, then these large states would have already approached their long-term steady state much earlier.¹⁵ Thus, in the following periods, it would have been normal for them to boast lower growth rates than their smaller counterparts.

Hence, the overall negative relationship between population size and economic growth per capita could be explained by the opening of the markets, caused by the country’s accession to the EU single market, which especially benefited the small Central and Eastern European countries

¹⁴ Statistically significant at the 1% significance level.

¹⁵ See the neo-classical growth model of Solow (1956) and Swan (1956).

(CEEC). However, it is likely that it is not the size of the population that is relevant here, but the different times of entry into the EU. Thus, there have been heterogeneous economic development levels during this time. This can be supported by a survey on this issue.

As we already mentioned, the economies of small states generally grew much faster than those of large states between 1995 and 2008. If we assume that these higher growth rates affect welfare positively, and that the citizens of these small countries perceive this as an increase in their own welfare, this sentiment should then be reflected in the surveys. Twice a year the Eurobarometer, a survey mandated by the European Commission, carries out personal interviews on various topics within the EU member states. Around 1,000 EU citizens per member state aged 15 years and older participate in the survey. Besides current issues, the Eurobarometer also contains continuous questions, in order to find certain trends in these issues over time.

Figure 7 presents such a question. It explicitly asks for the corresponding welfare increase for each respective EU membership. The results from autumn 2010 show that 50% of the members of the whole EU population believe that their own EU membership is beneficial to them. However, if we observe the individual national results, it is clear that the 6 large EU states (Poland, Spain, Germany, France, Italy and the UK) are divided on this issue: 2 are above the 50% average of the EU and 4 below (with the UK at the very bottom of the list). However, 15 of the 21 small EU countries lie over the EU average (with Slovakia in the lead), and merely 6 below it. Citizens in small countries are thus more convinced of the benefits of EU membership.

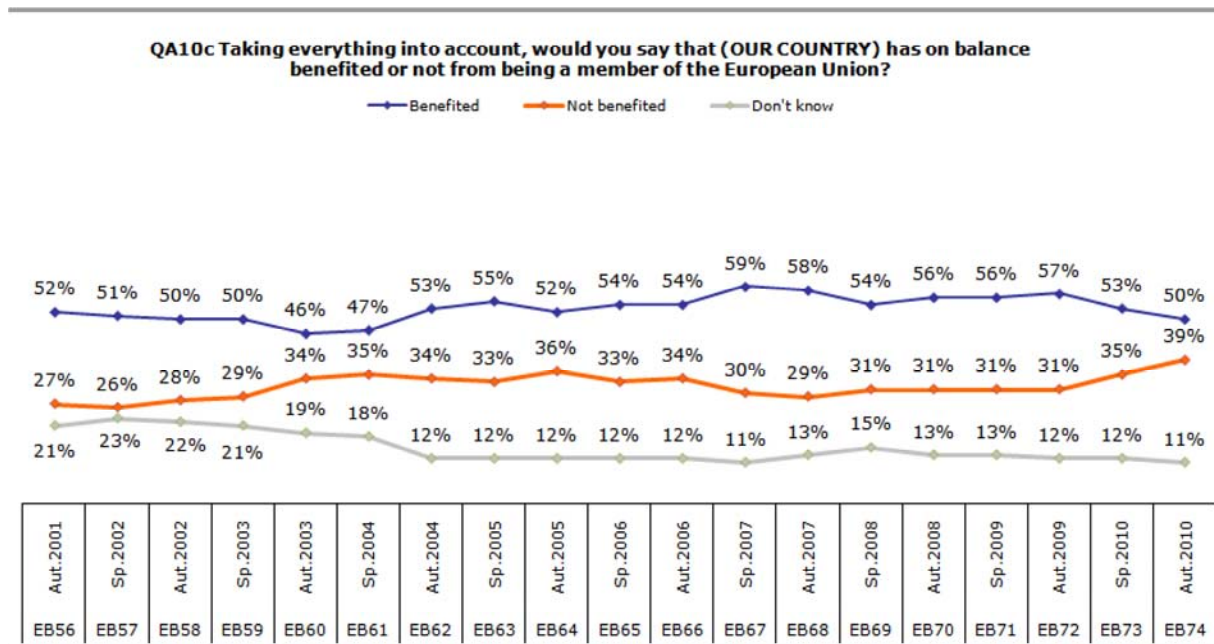
Figure 7: Eurobarometer for EU membership (part 1)

UK	CY	AT	IT	LV	HU	FR	DE	BG	PT	EU-27	ES	FI	SI	EL	CZ	RO	SE	MT	BE	NL	EE	IE	DK	LT	LU	PL	SK
27%	39%	43%	43%	44%	45%	46%	49%	49%	50%	50%	51%	51%	51%	53%	53%	53%	55%	55%	63%	67%	68%	69%	70%	72%	74%	78%	78%

Source: European Commission (2011a), p. 37, own representation.

Figure 8 shows the results of the same question, but over a longer period of time. While the average feedback from EU citizens became ever more pessimistic between 2001 and 2003, there was a significant shift towards an increasingly positive opinion for the positive welfare effects that EU membership provides. During this time, the shares of pessimists (“not benefited”) and the oblivious (“do not know”) dropped accordingly. A reason for this shift could be the accession of the 10 new Central and Eastern European member states, which took part in the Eurobarometer for the first time in fall 2004. 9 of these 10 CEECs are small states, and thus may have strongly influenced these results.

Figure 8: Eurobarometer for EU membership (part 2)



Source: European Commission (2011b), p. 36.

If we were to incorporate the annual contributions to the EU budget and its subsequent distribution among the members into the investigation,¹⁶ we could identify that among the 18 states that clearly express that EU membership increases welfare, 14 are net recipients of the EU budget. Only 3 of these countries (Bulgaria, Latvia and Hungary) are found to be below the EU average. On the other side, the majority of the net contributors to the budget are convinced not to benefit from their EU membership. Only 4 (Denmark, the Netherlands, Finland and Germany) reach a positive judgment on this issue. It is clear that those states that receive more funding from the EU budget than they contribute react predominantly positively to union membership, and vice versa.

It is thus possible that the results shown in Figure 7 are not only influenced by the higher economic growth rates of smaller EU states, but also by the distribution of EU funds. This may explain the sudden improvement in the opinion of increased welfare of EU citizens depicted in Figure 8, since 9 of the 10 CEECs that joined the EU in 2004 are net recipients.

In the next section we shall further investigate the concrete impact the population size and other factors (such as EU membership, level of economic development and EU funds) have on economic growth.

¹⁶ See European Commission (2010).

5. Econometric Analysis of the Significance of the Size of Nations on Economic Growth in the European Union

In order to reach a differentiated assessment of the economic significance of the size of nations in the European Union, we shall perform an econometric analysis to measure the influence and the statistical significance of the size of an EU country on its economic success. Using a panel data set, the annual data include various economic variables of the EU-27 countries (except Luxembourg) for the period between 1995 and 2008, and are principally obtained from the Eurostat database.¹⁷

Based on Alesina et al. (2005), economic success is interpreted as economic growth. In contrast to their research, our analysis does not concentrate on the growth rates of GDP per capita with regards to a reference year. Instead, we use the respective annual growth rates of each year, since neither the growth speed nor the convergence of income per capita will be measured in the present analysis. Nonetheless, the basic idea of Alesina et al. (2005) is retained and reflected in the initial equation.¹⁸ Extending their idea by including additional variables will provide further insights into whether the size of nations negatively affects economic growth in the EU states (as the bivariate relationship suggests) or whether this link stems from other conditions, such as EU membership, the level of economic development or the distribution of EU funds.

For this purpose, we shall assume the following initial equation:

$$\ln \frac{y_{it}}{y_{it-1}} = \beta_0 + \beta_1 \ln POP_{it} + \beta_2 \ln O_{it}^{EU} + \beta_3 \ln FDI_{it}^{EU} + \beta_4 \ln y_{it-1} + \epsilon_{it} \quad (1)$$

where y_{it} represents the real GDP per capita (in PPS) from country i at time t , POP_{it} the population size and O_{it}^{EU} the degree of openness to foreign trade (the sum of imports and exports in relation to GDP), and FDI_{it}^{EU} measures the stock of inward FDI (in relation to GDP). ϵ_{it} indicates the error term and includes all the unobservable influences on the target variable. In order to highlight the role of the EU single market, the data on trade openness and on FDI stocks are based exclusively on the EU-27 as trade partners (so-called intra-EU trade).

In theory, both the population and the degree of openness should have a positive impact on economic growth.¹⁹ The larger the population, the better the factor endowment usually is, and comprehensive foreign trade is associated with efficiency gains. Both should therefore lead to higher GDP growth rates per capita. An increase in FDI stocks should also be expected, and with

¹⁷ The FDI and HDI data are supplemented by the databases from UNCTAD and UNDP.

¹⁸ Only their variable "openness to trade * population" is replaced by the variable FDI_{it}^{EU} , since foreign direct investment is promised as an essential explanatory variable for economic growth. See for this purpose i.a. Brems (1970), Balasubramanyam et al. (1999) and De Mello (1999).

¹⁹ See Alesina et al. (2005), p.1509.

it an increase in investment rates, which in turn induces higher growth rates.²⁰ However, an increase in per capita income in the previous period should cause a less positive (diminishing) impact on the economic growth rate, as it converges towards its own steady-state growth rate.²¹

Table 1 shows the results of different regression scenarios. From the results of the OLS estimation (column 1), we can observe that all the variables except for population exhibit the expected signs, in accordance with the theory (even though openness is in this case not statistically significant). The negative sign for population – which is also statistically insignificant – does not correspond to the existing theory, but reflects the observation made in the previous section.

Table 1: Determinants of Economic Growth in the EU Member States (1995 – 2008)

	(1) OLS	(2) OLS	(3) Random Effects	(4) Instrumental Variables
$\ln POP_{it}$	-0.001 (0.002)	0.002 (0.002)	0.003 (0.002)	0.016** (0.007)
$\ln O_{it}^{EU}$	0.001 (0.006)	0.003 (0.005)	0.002 (0.006)	0.007** (0.003)
$\ln FDI_{it}^{EU}$	0.009* (0.005)	0.009* (0.005)	0.013*** (0.004)	0.020*** (0.007)
$\ln y_{it-1}$	-0.032*** (0.004)	-0.028*** (0.010)	-0.031*** (0.008)	-0.061*** (0.023)
EU_{it}		0.016** (0.007)	0.014** (0.006)	0.015** (0.007)
$\ln SF_{it}$		0.002 (0.005)	0.007** (0.003)	0.012** (0.005)
$\ln F_{it}$		0.009 (0.010)	0.013 (0.010)	0.016** (0.007)
$\ln \Delta HDI_{it}$		0.018** (0.007)	0.016*** (0.003)	0.014*** (0.004)
<i>Constant</i>	0.327*** (0.058)	0.309*** (0.103)	0.294*** (0.092)	0.366 (0.315)
<i>No. of observations</i>	364	364	364	364
<i>corr. R²</i>	0.184	0.444	0.400	0.562

Notes: standard errors in parenthesis are robust with respect to heteroskedasticity; level of significance: *** p < 0.01, ** p < 0.05, * p < 0.1; regressions (2) and (3) include year dummies; regression (4) includes year and country dummies.

Hausman test for regression (3): $\chi^2 = 7.39$ (prob. 0.997).

Endogeneity test for regression (4): $\chi^2 = 8.481$ (p. 0.004).

Underidentification test for regression (4): $\chi^2 = 57.772$ (p. 0.000).

Weak identification test for regression (4): 47000.

²⁰ See De Mello (1999).

²¹ See Barro/Sala-i-Martin (2004), p. 50f.

The missing significance for most variables and the misleading sign for population size indicate that distortions in the model exist due to missing variables (omitted variable bias). For this reason, the model will be re-run with additional variables. The equation will then present itself as:

$$\ln \frac{y_{it}}{y_{it-1}} = \beta_0 + \beta_1 \ln POP_{it} + \beta_2 \ln O_{it}^{EU} + \beta_3 \ln FDI_{it}^{EU} + \beta_4 \ln y_{it-1} + \beta_5 EU_{it} + \beta_6 \ln SF_{it} + \beta_7 \ln F_{it} + \beta_8 \ln \Delta HDI_{it} + \epsilon_{it} \quad (2)$$

where the dummy variable EU_{it} represents the respective EU membership and demonstrates whether the EU membership or the date of accession to the EU has an impact on economic growth. As shown above, the accession to the EU and the corresponding full access to the EU single market, as well as the resulting efficiency gains should positively influence economic growth.²² The variable SF_{it} relates to the previously indicated net distribution of EU funds. The structural and cohesion funds of the EU are considered, since these primarily provide for the building and improvement of institutional and economic structures of economically weak regions and countries in the EU. These funds are supported with payments received from the pre-accession aid for candidate countries (IPA, until 2007 divided by PHARE, ISPA and SAPARD) and from the transition aid (“transition facility”). These EU payments are especially relevant to the economic growth of the younger EU states, and the funds are related to the GDP in the regression and should be expected to have a positive sign.

The variable F_{it} identifies the average number of foreign languages learned in school per inhabitant, which should also positively affect the GDP growth rates. Foreign languages reduce transaction costs, increase cultural adaptability and are a good indicator of the improvement of education in general in a country. In a multi-linguistic and multi-cultural EU, this should lead to higher economic growth.²³ The variable ΔHDI_{it} indicates the annual change in the results, obtained from the Human Development Index (HDI) from the United Nations. The HDI is an index of social and economic development, which measures real GDP per capita, life expectancy as well as educational level with the help of the literacy and enrollment rates of the population of a country each year. A lower HDI describes a lower level of development and implies more untapped potential for development. A positive change in the HDI value is therefore preceded by a positive development in the country, which should thus have a favorable impact on economic growth.²⁴ Such a positive change is especially anticipated for the ten CEE accession countries.

²² Since the prospect of permanent EU membership can already trigger a positive growth momentum, the EU dummy was also equipped with different “time lags”. The results of these tests come very close to the ones illustrated in Table 1, and were therefore not considered further.

²³ See Fidrmuc (2009).

²⁴ See Barro (1996).

All four new variables in the regression should thus have a positive impact on economic growth. Their inclusion should to some extent clear the distortion in the first OLS estimation and reveals the actual (undistorted) explanatory power of the state size.²⁵

The second OLS regression (2) shows that the additional specification of the model significantly changes the impact of population size on economic growth. From an initial negative relationship, a slightly positive influence has emerged, now providing the theoretically expected sign, even if it is still not statistically significant. The four new variables also show the expected signs and are partly statistically significant (i.e. EU membership and development level).

In order to increase the efficiency of these results, the regressions are then carried out with fixed-effect and random-effect estimators. The results of the Hausman test suggest that the latter is the preferable estimation procedure. As seen in regression (3) the results are very similar to the values from regression (2). The statistical significance of some estimators has partly increased. The unobservable heterogeneity seems to be thus well shown and is relatively robust. So, in order to increase further the validity of the results, the problem of endogeneity between population size and economic growth is taken into account in regression (4). Endogeneity is here characterized by simultaneous causation of these two variables. Economic growth would thus also have an effect on the change in population size (and vice versa), which could be explained by migration, i.e. migrants moving to a country whose economic growth offers favorable employment possibilities.²⁶ The evaluation of an endogeneity test confirms this assumption; hence, the present endogeneity problem requires the use of an appropriate instrument. Based on Rose (2006), the surface area of a country is used as an instrument for population size. The results from the weak and underidentification tests show that this instrument is well suited to our present regression.

The results from regression (4), which represents the most efficient method based on the previous reasoning, now have consistent statistically significant values, which further support our previous reflections. Furthermore, all the variables have the expected positive or negative influence on economic growth according to the theory.

A country's size, *ceteris paribus*, positively affects its economic growth. Openness and FDI also contribute to economic growth, and an increasing income per capita in the previous period has the expected negative impact on growth in the current period. It is also clear now that membership of the EU in general and access to EU funding in particular are significant for economic growth. This applies equally to the knowledge of foreign languages and to positive changes in social and economic development (as found mainly in the Central and Eastern European transition countries).

²⁵ Additionally, year dummies are included in the regression in order to control for time-specific macroeconomic shocks.

²⁶ See Chies (1994), p. 28.

A large country with a sufficient labor force and capital, as well as a large domestic market, therefore positively affects the GDP growth rate, *ceteris paribus*. Small EU countries thus have a disadvantage in terms of size. As explained in the descriptive analysis, small EU states in fact tend to show higher growth rates in the observed time. Thus, the reason for this happening is probably less due to the direct effect of the size of the country and more due to the fact that most small EU states are transition countries, and the resulting catching-up process being the reason for their furious growth rates. Their late entry into the EU could also explain their high economic growth given the fact that especially in the first years of accession high integration gains are expected. Moreover, these countries are net recipients of EU funding, which further influences their results.

In general, it should also be noted that – as shown above – small countries are identified with relatively high openness, and according to the analysis above, this in turn positively affects economic growth. Through the membership of the EU, access to direct investments has also especially improved. Since this also positively affects growth, this could also explain higher growth rates for small EU countries.

6. Conclusion

The aim of this paper was to highlight the meaning of the size of the state for members of the European Union, thereby making the economic success of EU states statistically tangible. Firstly, we showed in descriptive illustrations that the theoretically expected characteristics of small countries clearly apply to the current EU states. From the theoretical perspective, only the bivariate relationship between the population size and the economic growth initially depicted an unexpected sign. However, the econometric analysis confirmed the assumption that this relationship is strongly influenced by factors other than population size, such as the duration of EU membership, the level of development (transformation process) and the increased development potential provided by EU funds. When subtracting these effects through appropriate statistical methods, there is an overall significant positive dependence of economic growth on the size of the state.

The issue raised in the title, “Small but Beautiful?”, can only apply to the EU members if the specific development characteristics are not detached from their state size. Only then, the current above average growth forecast for most small EU countries could be justified in this context. This approach would, however, poorly reflect the isolated impact of the size of nations on economic success and would lead to distorted results.

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