

Duality in Cyclical Trends in European Union Confirmed

SAGE Open
January-March 2018: 1–7
© The Author(s) 2018
DOI: 10.1177/2158244017753268
journals.sagepub.com/home/sgo



Simona Hašková¹ and Marek Vochozka¹

Abstract

This article differentiates the euro-economies in terms of the degree of synchronization with the cyclical position of Germany perceived herein as a hegemon economy. The purpose of this study is the identification of the euro-economies that can be identified as an effective monetary area in terms of similarity in economic structure with German economy. The cyclical position is expressed as an average of absolute values of differences of the output gaps between euro-countries and Germany. This procedure is supplemented by correlation and comparative analysis and with the assessment of empirical findings. Two groups are identified according to similarities in cyclical positions. Similar economic performance was ascertained in Austria, Belgium, France, Luxembourg, the Netherlands, and Finland, the economies of which are thus labeled as an effective currency region in the sense of optimum currency area. The assessment of the future development in Eurozone is made taking into account the current political and economic circumstances and the outputs of empirical analyses.

Keywords

effective currency area, optimum currency area, monetary policy, cyclical heterogeneity, Eurozone

Introduction

“The art of economics consists in looking not merely at the immediate but at the longer effects of any act or policy; it consists in tracing the consequences of that policy not merely for one group but for all groups” (Hazlitt, 1946, p. 1). This thesis was, according to some economists (e.g., Krugman, 2013), ignored in the case of the single currency euro introduction.

The theoretical and empirical aspects of the single monetary policy were studied by many authors; among those studies, Mundell (1961) can be seen as one of the most significant contributors. Mundell in his early work provided an analytical framework outlining the conditions for the thriving functioning of the monetary union. The main prerequisite of successful monetary integration is linked to the characteristics of the geographic area that has a high degree of labor mobility factor inside and vice versa labor immobility factor outside (the optimum currency area). For that reason, such an area should have one currency inside and outside; it should have a flexible exchange rate; the labor mobility is seen as a substitute for the exchange rate variability. As regards the idea of monetary integration of Europe, Mundell literally says, “The question thus reduces to whether or not Western Europe can be considered a single region, and this is essentially an empirical problem.” In his later work, Mundell extended his analysis with a requirement for the stability of the purchasing power of the integrated currency region (Fleming, Johnson, & Swoboda, 1973, p. 1).

Krugman (2013) perceived Mundell’s theory of the optimum currency area as a theory about finding a balance between potential gains and losses in a qualitative sense. The success of monetary integration is conditioned by the existence of labor mobility, a similar economic structure, and fiscal integration (Kenen, 1969). The argument for the requirement of the compliance of a similar economic structure of the participating states is to minimize the occurrence of such asymmetric shocks that would otherwise require different monetary policy interventions (i.e., an effort to reduce cyclical heterogeneity in the monetary union conjugate countries). The argument for the fiscal integration policy leans on utilizing the opportunity of mutual insurance against the asymmetric development of united economies; in such a case, it is possible for the country affected by a negative shock to obtain a positive net transfer from a country not affected. Fidrmuc (2015) remarked that if the asymmetries are temporary, the effects of such an applied “suboptimal” fiscal policy are short term and may be offset by the benefits of risk sharing under the terms of mutual fiscal insurance. However, if the shocks are of a permanent nature, fiscal transfers will become largely deterministic and unidirectional with long-term costs burdening the donors.

¹The Institute of Technology and Business in České Budějovice, Okružní, Czech Republic

Corresponding Author:

Simona Hašková, The Institute of Technology and Business in České Budějovice, Okružní 517/10, 370 01 České Budějovice, Czech Republic.
Email: haskovas@post.cz



The economic slump in Europe activated by the 2007 financial crisis renewed the debate about the relationship between the economic cyclicity of the participating countries and the efficiency of a monetary union in a situation of a nonexistent fiscal stabilization mechanism, limited mobility of labor factor, and economic heterogeneity of the member states (this issue was analyzed based on empirical data given in Montani, 2011, or Collignon, 2013).

In the context of the 2007 financial crisis, Fingleton, Garretsen, and Martin (2015) examined the vulnerability of heterogeneous economies bound by the euro. Their findings indicate that the larger the asymmetry of shocks across regions sharing single currency is, the more this area deviates from the optimum currency area in terms of the monetary policy implemented. Cancelo (2012) presented empiric evidence that the foundations, which explain the formation of the national cycles across the European Monetary Union aggregated through the crisis, were already latent in 2007.

Several authors have examined the influence of German interests on the formation of the European monetary policy. Kaltenthaler (2002) argued that the nature of the European monetary policy was influenced by German economic interests rather than the interests of European policy elites. From another perspective, the nature of the European monetary policy has been examined by Bulmer and Paterson (2013). It focused on the analysis of the evidence of the hegemonic role of Germany, which is considered to be a key player in the field of EU policy (Krampf, 2014); specifically, it deals with the interaction between Germany and the European Central Bank and the European Commission. Also, De Grauwe in 2013, saw the political objectives behind the decision to create the euro as a common currency with Germany and France being the main players in this field; as for France, its inferior position that it occupied in the European Monetary System initiated a proposal of monetary union (as justified in Jabko, 1999, in detail); as for Germany, the ultimate goal of unification was to perennially link the fates of France and Germany and thus to eliminate the danger of future wars on the European continent (Ash, 2012).

The purpose of this article is to differentiate the euro-economies in terms of the degree of synchronization with the cyclical position of Germany (hereinafter “reference region”). The cyclical position mirrors itself in the economic cycle in which euro-countries are found at a given time when compared with the reference region. Within the analysis, the assumption of the economic and political hegemony of Germany is accepted (based on the profound quantitative and qualitative analysis and rational arguments found in Paterson, 2011, and Bulmer, 2014). The synchronization/nonsynchronization of euro-economies with the reference region is assessed by means of a statistical and comparative analysis of the output gaps of gross domestic product for the period 2002–2016 (the data source was a publicly accessible database: OECD.stat, 2016). Artis, Krolzig, and Toro (2004)

performed empirical analysis, which showed that larger differences in output gaps indicate a more serious fluctuation in the phase of the economic cycle.

Methodological Approach

The analysis of cyclical synchronization/nonsynchronization of the monitored euro-economies entering the Eurozone before and inclusive of 2002 compared with the German economy in the period 2002–2016 of the economic cycle is based on the quantification of the average difference of output gaps (Miles & Vijverberg, 2016, assessed cyclical synchronization of Eurozone by means of a method of switching Markov models examining the changes in output). The output gap of each economy in a given year is the difference of the real product (Y) and the potential product measured in percentage of Y . The average of absolute values of differences of the output gaps of the monitored economies (G_i^t) (where G signs for an output gap of the i th economy at the time t) and the reference economy (G_R^t) (wherein index G denotes the output gap of reference economy R at the time t) in the period $t = 1; n$ is quantified by the relationship shown in Equation 1; it defines the respective average deviation of the cyclical position of the i th economy observed from the cyclical position of the reference economy R .

$$\overline{X}_i = \frac{1}{n} \cdot \sum_{t=1}^n |G_R^t - G_i^t|. \quad (1)$$

The criterion defining the interface between the cyclical synchronized and unsynchronized euro-economies is the geometric mean of the average deviations \overline{X}_i calculated standardly according to Equation 2, where m stands for the number of countries considered. Furthermore, the statistical correlation of G_R^t and G_i^t is expressed and its relevance to the problem discussed.

$$G_{\overline{X}_i} = \left(\prod_{i=1}^m \overline{X}_i \right)^{1/m}. \quad (2)$$

The imperfections of the criteria Y discussed by van den Bergh (2009) are disregarded. Furthermore, it is assumed that the potential output approximately expresses the highest sustainable performance of the economies under the condition of disposable amount and quality of factors of production (Durlauf & Blume, 2008).

Potential product is considered to be a relatively good criterion for depicting the state of the economy in the absence of demand and supply shocks in all markets (Gerlach & Smets, 1999). Although the identification of the disparity between the real and potential product is ambiguous (it is not clear to what extent it is, for example, a negative demand shock or a negative supply shock—both types of shocks within the metrics used reflect in the same direction, that is, in decline in the real output, though the monetary policy response may not be identical), it can be considered as an

Table 1. The Cyclical Heterogeneity of Eurozone Countries in Comparison With the German Economy (Ranked in Ascending Order According to the Indicator of Average Deviation, \bar{X}_i).

Eurozone countries	The average deviation from the cyclical position of the German economy (\bar{X}_i) (in % of Y for the period 2002-2016)	R^2 (the predictive power of the regression model) [0, 1]	r (correlation of output gaps in 2002-2016) [-1, 1]
Belgium	1.08	.38	.62
France	1.39	.27	.52
Luxembourg	1.4	.412	.87
Austria	1.5	.31	.56
Netherlands	1.54	.26	.51
Finland	1.93	.39	.62
Italy	2.16	.15	.39
Portugal	3.19	.008	.09
Spain	4.04	.025	.13
Ireland	5.66	.081	.28
Greece	7.73	.002	-.04

acceptable summarizing criterion (Apel & Jansson, 1999). We agree with Mandel and Tomšík (2015) who consider the synchronization appraisal of economies according to the growth rate as incorrect. The growth rate is a variable capturing the growth/decline of real product due to past performance expressed in percentage, which insufficiently indicates the phase of the economic cycle in which the economies are found. The product growth rates may be similar, although the phases of the economic cycle are fundamentally different and require different interventions of monetary policy (Grossman & Helpman, 1993).

Analysis of Cyclical Heterogeneity of Euro-Economies According to Output Gaps

The impacts of demand and supply shocks on the Eurozone countries during the period 2002-2016 depict the respective positions of cyclical deviations of the monitored economies from the cyclical position of the reference economy. The cyclical deviations calculated according to Equation 1 are summed up in Table 1. The higher the value, the greater the divergence of the cyclical position of the countries surveyed compared with the reference region.

According to the criterion of “synchronization,” it is possible to identify the degree of similarity of the economic cycle in Austria, Belgium, France, Luxembourg, the Netherlands, Finland, and Italy (further referred to as Group I) with the German economy. Similar development is identified in the countries whose average deviation from the cyclical position of Germany is located in the range [0, 2.3] percentage of Y in the selected period (see Table 1). The upper border value 2.3 is given by the geometric mean of the average deviations (see Equation 2). Conversely nonsynchronization is identified in the case of Ireland, Greece, and Spain, and to a lesser extent in Portugal (the property of asynchronous development of the cyclical position is related

to economies whose average deviation from the potential product is higher than 2.3% of Y compared with the reference region—further referred to as Group II).

The correlation coefficients r as well as the coefficients of determination R^2 (see Table 1) can be considered as the implementation of statistical relations between the values of the output gaps of the reference region and the surveyed euro-economies. These statistical measures are widely used to explain macroeconomic relations, for example, in Bianchi and Civelli (2015), Kiley (2013), or Havránek (2010). However, as Den Haan (2000, p. 3) pointed out, “unconditional correlation coefficients lose significant information about the dynamic aspects of the co-movement across variables.” In case of nonstationary variables, the unconditional correlation produces spurious estimates—as they do not imply causation. Therefore, it is necessary to consider their substantive contribution to the analysis according to other standards. The degree of similarity in terms of r and R^2 is, therefore, assessed by means of the comparative approach whose results are captured in Figure 1. The regression lines there define a relationship between the reference region and the surveyed euro-economies. This relation leans on the assessment of the cyclical positions of the euro-economies of Ireland, Greece, Luxembourg, and Austria, and the reference region by means of the analysis of annual deviations from the potential product for the period 2002-2016.

The relationship between the components of the cyclic position of Ireland and the cyclic position of the reference region (see the upper left graph of Figure 1) exhibits a low value of the coefficient of determination ($R^2 = .08$) as well as a low value of correlation ($r = .28$). From Figure 1, it can be specifically learnt, for example, that when the output gap in the reference economy was above the potential by 0.71%, 2.57%, 0.59% and 0.03% of Y, the corresponding values of output gaps in Ireland amounted to 8.46%, 9.42%, -6.31%, and -4.51% of Y. In the case of the under potential values of -1.58%, -1.75%, and -1.9% of Y of the reference region, the Irish output gap was

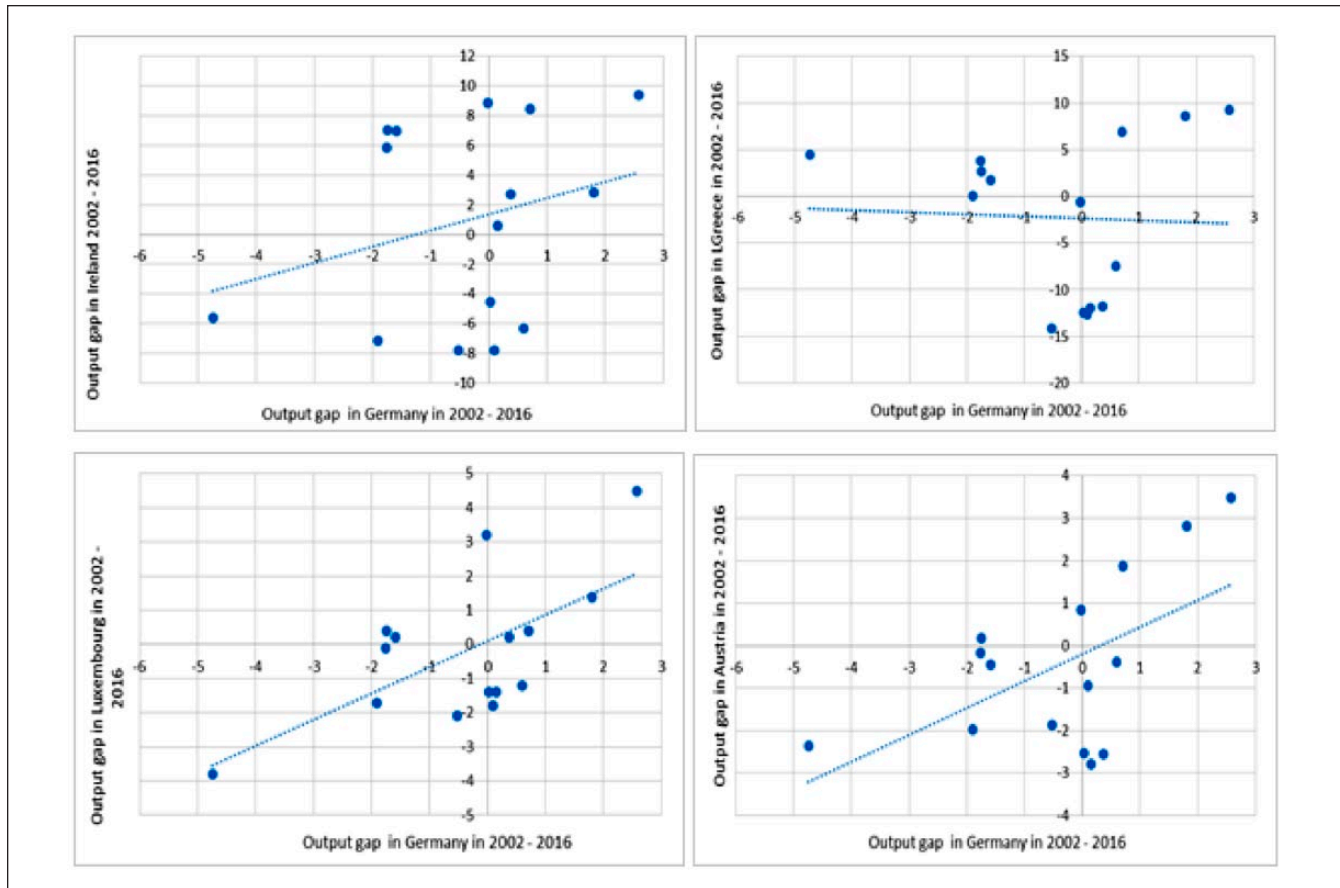


Figure 1. The output gaps in percentage of Y of the reference region versus output gaps in euro-countries Ireland, Greece, Luxembourg, and Austria.

7%, 7.02%, and -7.15% of Y. From this, the disproportion in the cyclical positions can be clearly seen. The right upper graph compares the output gaps of the reference region with the output gaps of Greece also revealing a strong disparity in the economic cycle ($R^2 = .002$, $r = -.04$). The relationship between the output gaps of Germany and Luxembourg (see the bottom left graph of Figure 1, with $R^2 = .412$, $r = .87$) shows substantial synchronization compared with previous cases. This also applies for Austria ($R^2 = .31$, $r = .56$), whose position of the output gaps of Y compared with Germany is shown in the bottom right graph of Figure 1. The same can be concluded in the cases of Belgium ($R^2 = .38$, $r = .62$), France ($R^2 = .27$, $r = .52$), Netherlands ($R^2 = .26$, $r = .51$), and Finland ($R^2 = .39$, $r = .62$).

Discussion

The monetary transmission mechanism being changed by the euro introduction has in general resulted in different responses in the two groups of euro-economies (see analytical part above). On the basis of a distribution of the euro-countries to Group I and Group II, let us consider that the Group I has not been significantly weakened by the single monetary policy effects. Euro-economies with the severe

cyclical deviations of Group II can, however, be deemed as more or less disadvantaged by the single monetary policy. De Grauwe and Foresti (2016) gave reasons for such a distribution pointing to the loss of ability of these economies to improve the strong asymmetric division by an appropriate manipulation of exchange rates to correct the real flow of goods and services within international trade and to appropriately influence national interest rates (Coudert, Couharde, & Mignon, 2013).

The empirical development of euro-economies studied in Barigozzi, Conti, and Luciani (2014) and Duwicquet, Mazier, Petit, and Saadaoui (2015) pointed to the strong cyclical heterogeneity of Italy owing to the idiosyncratic nature that can barely be coordinated by the single monetary policy ($X_{Italy} = 2.16\%$ of Y, which lies on the division line between Group I and II; see Table 1). Coudert et al.'s (2013) analysis quantified the degree of currency overvaluation in 2010 to which contributed the fall of net foreign assets and productivity regression in Greece, Spain, and Portugal, and to a lesser extent also in Italy. Conversely, Hardiman, Blavoukos, Dellepiane, and Pagoulatos (2016) noted that Ireland began to escape the after 2008 crisis stagnation of Greece, Spain, Italy, and Portugal as its

Table 2. The Heterogeneity in Outputs Gaps (percentage of Y) of Ireland, Portugal, Greece, Spain, and Italy Compared with the Output Gaps of Germany in 2015 and 2016.

Year	Germany	Ireland	Greece	Portugal	Spain	Italy
2015	0.15	0.60	-11.964	-5.480	-4.971	-3.712
2016	0.37	2.73	-11.778	-4.438	-2.755	-2.397

productive activities were narrowly integrated into the Anglo-European economy. This opinion coincides with the development of the output gaps in the years 2015 and 2016 shown in Table 2; Ireland's favorable recovery pace toward German economy is clearly identifiable from there (the Ireland's strong recovery was confirmed by a number of analyses, for example, Fitzgerald, 2014; Keane, 2015; Reeves & Palcic, 2017). As a matter of fact, Ireland's recovery became apparent from 2013 and 2014 with an increase in Y and its future development depends on the factors that are beyond the control of national government such as the stability in the international trade, private debt, oil prices, or the appreciation of the dollar and sterling relative to the euro (Johnston & Regan, 2016).

Updating the statistical outcomes of the analytical section with these empirical findings and scientific analyses, Ireland, due to its productive recovery, can be perceived as a part of Group I; on the contrary, Italian after crises development resembles the euro-economies of Group II rather than the economic development in Group I. The question of whether or not Europe can be regarded a single region in terms of a similar level of economic performance can be positively answered in the case of Austria, Luxembourg, Belgium, France, Finland, and the Netherlands. This result corresponds with Regan (2017), who claims that uniting together two dissimilar macroeconomic regimes (domestic demand-led models, which prevail in southern Europe, and export-led models, which predominate the area of northern Europe) is the real origin of the euro crisis. From the short-term analysis point of view, Ireland can be included as well. Since the financial crisis in 2007, persistent heterogeneity is identified in Greece, Spain, Portugal, and Italy. This result is supported by Miles and Vijverberg (2016), already referred to in the methodological part, whose empirical analysis led them to conclusion that adoption of a single currency increased synchronization trend for nations ready for a single currency (namely the states of Group I), but it increased desynchronization of nations that were far from being synchronized before monetary unification (namely the states of Group II).

The results imply that single monetary policy and a single exchange rate cannot work in the conditions of structurally different economies (Fabbrini, 2013). This is probably an irreparable structural defect, which can be hardly healed by means of stabilization funds (Griffith-Jones & Ocampo, 2009). Under the current political and economic circumstances, we are inclined to the opinion of Sinn (2014), who,

based on empirical data and the past and current political and economic development in the European Union, submitted rational arguments of the future development in Eurozone:

- The currency union will not fall apart; the countries extremely affected by the adoption of the euro will remain the part of it.
- Much of the debt of the highly indebted states will be forgiven so that they could revitalize.

The view of survival of monetary union in the present state is also shared by Eichengreen and Wyplosz (2016) under the condition that the minimal requirements will be fulfilled. These cover the decentralized fiscal policy, centralization of financial supervision, and monetary policy and debt restructuring. Furthermore, the results of a number of statistical and fundamental analyses (e.g., those performed by Baum, Checherita-Westphal, & Rother, 2013, and Égert, 2015), confirm that to mitigate the effects of the unsuitable single currency in the long term, it is necessary to keep the public debt and taxes within reasonable limits; these limits should vary for different economies.

Conclusive Summary

The optimum currency area theory provides an analytical framework for the functioning of a monetary union. One premise of a successful monetary integration is linked to the characteristics of the geographic area that has a high degree of mobility of factors inside and immobility of factors outside, besides which, a similar economic structure and fiscal integration are required. The purpose of this article was to retrospectively identify euro-economies that met the assumption of similarity in the economic cycle for the period 2002-2016 with the German economic cycle, which is conceived as hegemonic euro-economy.

For this purpose, the economies were analyzed wherein the euro was the denominated currency before and inclusive of 2002 (Germany, Belgium, Austria, France, Luxembourg, the Netherlands, Finland, Ireland, Greece, Spain, Italy, and Portugal) from the perspective of the degree of synchronization with the cyclical position of Germany. The cyclical position, expressed as an average of absolute values of differences of the output gaps of euro-countries and Germany, reflects the economic cycle in which each member country is found on average in relation to Germany. The greater the difference in yearly gaps of the product, the more severe the occurrence of dissimilarity in the economic cycle (the strongest dissimilarities were manifested in Greece, Ireland, Spain, and Portugal). This procedure was supplemented by correlation and comparative analysis together with the assessment of empirical findings, which led to the conclusion that the western European countries can be perceived as a single region in terms of a similar economic structure (Austria, Belgium, France, Luxembourg, the Netherlands, and Finland) and as

such can form an effectively functioning monetary union. The assessment of the development in Eurozone for future decade was made taking into account the current political and economic circumstances and the outputs of empirical analyses.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

- Apel, M., & Jansson, P. (1999). A theory-consistent system approach for estimating potential output and the NAIRU. *Economics Letters*, 64, 271-275.
- Artis, M., Krolzig, H.-M., & Toro, J. (2004). The European business cycle. *Oxford Economic Papers*, 56, 1-44.
- Ash, T. G. (2012). The crisis of Europe: How the Union came together and why it's falling apart. *Foreign Affairs*, 91(5), 2-15.
- Barigozzi, M., Conti, A. M., & Luciani, M. (2014). Do Euro area countries respond asymmetrically to the common monetary policy? *Oxford Bulletin of Economics and Statistics*, 76, 693-714.
- Baum, A., Checherita-Westphal, C., & Rother, P. (2013). Debt and growth: New evidence for the Euro area. *Journal of International Money and Finance*, 32, 809-821.
- Bianchi, F., & Cividini, A. (2015). Globalization and inflation: Evidence from a time-varying VAR. *Review of Economic Dynamics*, 18, 406-433.
- Bulmer, S. (2014). Germany and the Eurozone crisis: Between hegemony and domestic politics. *West European Politics*, 37, 1244-1263.
- Bulmer, S., & Paterson, W. E. (2013). Germany as the EU's reluctant hegemon? Of economic strength and political constraints. *Journal of European Public Policy*, 20, 1387-1405.
- Cancelo, J. R. (2012). Cyclical synchronization in the EMU along the financial crisis: An interpretation of the conflicting signals. *European Journal of Government and Economics*, 1, 86-100.
- Collignon, S. (2013). Macroeconomic imbalances and competitiveness in the Euro area. *Transfer: European Review of Labour and Research*, 19, 63-87.
- Coudert, V., Couharde, C., & Mignon, V. (2013). On currency misalignments within the Euro area. *Review of International Economics*, 21, 35-48.
- De Grauwe, P. (2013). The political economy of the Euro. *Annual Review of Political Science*, 16, 153-170.
- De Grauwe, P., & Foresti, P. (2016). Fiscal rules, financial stability and optimal currency areas. *Economics Letters*, 145, 278-281.
- Den Haan, W. J. (2000). The comovement between output and prices. *Journal of Monetary Economics*, 46(1), 3-30.
- Durlauf, S. N., & Blume, L. (2008). *The new Palgrave dictionary of economics* (Vol. 6). Basingstoke, UK: Palgrave Macmillan.
- Duwicquet, V., Mazier, J., Petit, P., & Saadaoui, J. (2015). The future of the euro. In S. Fadda & P. Tridico (Eds.), *The economic crisis in social and institutional context: Theories, policies and exit strategies* (p. 134). Routledge Advances in Heterodox Economics.
- Égert, B. (2015). Public debt, economic growth and nonlinear effects: Myth or reality? *Journal of Macroeconomics*, 43, 226-238.
- Eichengreen, B., & Wyplosz, C. (2016). Minimal conditions for the survival of the Euro. *Intereconomics*, 51, 24-28.
- Fabbrini, S. (2013). Intergovernmentalism and its limits: Assessing the European Union's answer to the Euro crisis. *Comparative Political Studies*, 46, 1003-1029.
- Fidrmuc, J. (2015). Political economy of fiscal unions. *European Journal of Political Economy*, 40, 147-157.
- Fingleton, B., Garretsen, H., & Martin, R. (2015). Shocking aspects of monetary union: The vulnerability of regions in Euroland. *Journal of Economic Geography*, 15, 907-934.
- Fitzgerald, J. (2014). *Ireland's recovery from crisis* (CESifo Forum No. 2, Vol. 15, p. 8). Munchen, Germany: Institut für Wirtschaftsforschung.
- Fleming, M., Johnson, H. G., & Swoboda, A. K. (1973). The economics of common currencies. *The Economic Journal*, 83(331), Article 928.
- Gerlach, S., & Smets, F. (1999). Output gaps and monetary policy in the EMU area. *European Economic Review*, 43, 801-812.
- Griffith-Jones, S., & Ocampo, J. A. (2009). *The financial crisis and its impact on developing countries* (Working Paper No. 53). Brasilia-DF, Brazil: International Policy Centre for Inclusive Growth.
- Grossman, G. M., & Helpman, E. (1993). *Endogenous innovation in the theory of growth* (No. w4527). Cambridge, MA: National Bureau of Economic Research.
- Hardiman, N., Blavoukos, S., Dellepiane, S., & Pagoulatos, G. (2016). *Austerity in the European periphery: The Irish experience* (UCD Geary Institute for Public Policy Discussion Paper Series No. WP2016/04). Dublin, Ireland: Geary Institute.
- Havránek, T. (2010). Rose effect and the Euro: Is the magic gone? *Review of World Economics*, 146, 241-261.
- Hazlitt, H. (1946). *Economics in one lesson: The shortest and surest way to understand basic economics*. New York, NY: Pocket Books.
- Jabko, N. (1999). In the name of the market: How the European commission paved the way for monetary union. *Journal of European Public Policy*, 6, 475-495.
- Johnston, A., & Regan, A. (2016). European monetary integration and the incompatibility of national varieties of capitalism. *Journal of Common Market Studies*, 54, 318-336.
- Kaltenthaler, K. (2002). German interests in European monetary integration. *JCMS: Journal of Common Market Studies*, 40, 69-87.
- Keane, C. (2015). Irish public finances through the financial crisis. *Fiscal Studies: The Journal of Applied Public Economics*, 36, 475-497.
- Kenen, P. (1969). The theory of optimum currency areas: An eclectic view. In R. Mundell & A. Swoboda (Eds.), *Monetary problems of the international economy* (pp. 41-60). Chicago, IL: University of Chicago Press.
- Kiley, M. T. (2013). Output gaps. *Journal of Macroeconomics*, 37, 1-18.
- Krampf, A. (2014). From the Maastricht treaty to post-crisis EMU: The ECB and Germany as drivers of change. *Journal of Contemporary European Studies*, 22, 303-317.
- Krugman, P. (2013). Revenge of the optimum currency area. *NBER Macroeconomics Annual*, 27, 439-448.

- Mandel, M., & Tomšík, V. (2015). Dynamics and balance of savings, investments, and credits in business cycle: The case of the Czech Republic. *Politická Ekonomie*, 2015, 32-56.
- Miles, W., & Vijverberg, C. P. C. (2016). Did the Euro common currency increase or decrease business cycle synchronization for its member countries? *Economica*. Advance online publication. doi:10.1111/ecca.12201
- Montani, G. (2011). Money and finance as global public goods: Contribution to a supranational macroeconomic theory. *SAGE Open*, 1(3), 1-11.
- Mundell, R. A. (1961). A theory of optimum currency areas. *The American Economic Review*, 51, 657-665.
- OECD stat. (2016). *Output gaps: Deviations of actual GDP from potential GDP as % of potential GDP* (Economic Outlook No. 99 [online]). Retrieved from <http://stats.oecd.org/Index.aspx?QueryId=51655>
- Paterson, W. E. (2011). The reluctant hegemon? Germany moves centre stage in the European Union. *Journal of Common Market Studies*, 49, 57-75.
- Reeves, E., & Palcic, D. (2017). Getting back on track: The expanded use of PPPs in Ireland since the global financial crisis. *Policy Studies*, 38, 339-355.
- Regan, A. (2017). The imbalance of capitalisms in the Eurozone: Can the north and south of Europe converge? *Comparative European Politics*, 15, 969-990.
- Sinn, H. W. (2014). *The Euro trap: On bursting bubbles, budgets, and beliefs*. Oxford, UK: Oxford University Press.
- van den Bergh, J. (2009). The GDP paradox. *Journal of Economic Psychology*, 30, 117-135.

Author Biographies

Simona Hašková is an assistant professor of business economy and finance at the Institute of Technology and Business. Her recent publications in English cover the topics of macroeconomic problems of Eurozone, microeconomic analyses of firm processes, economic analyses of renewable resources and decision making processes based on fuzzy approach.

Marek Vochozka is a professor of business economy and finance at the Institute of Technology and Business. His recent publications in English cover the topics of neuron networks applications in the economy, economic analyses of renewable resources, analyses of economic consequences of environmental policy, etc.