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ECONOMIC POLICY DECISIONS IN THE PERSPECTIVE OF THE EUROPEAN ACCESSION: A SIMULATION APPROACH**

Abstract. Using the standard simulation tools of mathematical economics we analyze the possible macroeconomic policy scenarios and their consequences. We have adjusted the neoclassical growth model to explain the well-known empirical facts typical for the transition economies as labor market imperfections, cyclical behavior, shortages of consumption goods, and capital. To overcome some unrealities of the basic Ramsey-Cass-Koopmans model we have incorporated into the modeling framework such popular economic concepts as Okun's Law, consumption habit formation, adjustment costs, export potential, foreign direct investment, and public capital accumulation. The questions asked in the simulation study focus on the impact of simultaneous decisions concerning the EMU fiscal criteria and absorption of the EU-funds on the economic growth in the perspective of the income convergence to the EU-15 average.

Keywords: accession policy, neoclassical model, EU-funds absorption, EMU fiscal criteria.
JEL Classification: C68, E65, F43.

1. INTRODUCTION

The solid economic grounds for policy decision-making are of high importance for all of the EU-accessing countries. The unprecedented success story of Ireland, positive experiences of Spain and Portugal, and a hard way to EMU of Greece are only limited arguments for the adoption of the EMU guidelines, i.e. low inflation, low interest rates, stable exchange rate, low public debt and deficit. The governments of EU-accessing countries (including Poland) have to deal with hard questions on current macroeconomic problems (cyclical downturn), as well as financial matters (high deficits, growing debts) and social ones (high unemployment). Those make the optimal

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fiscal and monetary policy rules very complex and not easy to establish. Thus with this simulation study we deliver the questions of EU-fund absorption vs. fiscal criteria fulfillment. We are mainly focused on their impact on the short-run economic growth and the long-run real convergence.

2. MODELING FRAMEWORK

The most popular neoclassical growth models (as Swan-Solow, or Ramsey-Cass-Koopmans model), widely used to explain the convergence hypothesis, oversimplify the technological relations in the economy and neglect open-economy issues. The neoclassical steady-growth path does not call for the optimal economic policy rules to influence the convergence process. The celebrated new growth models (as P. Romer or R. E. Lucas) supply the growth accounting with the endogenous technological progress and the troublesome, though significant production factors (as human and social capital). In this modeling framework the fast growth of the catching-up economies does not have to be only the short-run transition phenomenon. The efforts to adjust the neoclassical growth theory to model accession convergence have been undertaken by e.g. Malaga (1999, Kliber and Malaga 2001). They focus on the idea of conditional convergence depending on the level of trade and budget deficit. Crespo-Cuaresma et al. (2002) argue that the choice of modeling structure (exogenous or endogenous) matters for a proper accounting of long-run integration benefits. Models with the 'catching-up effect' (e.g. van de Klundert and Smulders 1998) basically assume that the real convergence is an automatic process. Thus "convergence policy" should only focus on the establishing sound rules of economic activity and on promoting the technological diffusion. Some economists add the depth to the analysis by incorporating cumulative growth elements (cf. Leond-Ledesma 1999). However, it is still the output or productivity gap, and the openness towards the world economy (trade, capital and foreign direct investment), that drive the dynamics of the "catch-up models."

In this study we propose the eclectic approach to simulating the Polish economy growth in the accession period. We try to check the neoclassical growth theory limits after adjusting its assumptions to some widely observed empirical facts in transition and emerging markets and introducing some institutional (economic policy) arrangements. Here we only discuss those important supply-and demand-side equations for the dynamics of the model which substantially depart from the standard neoclassical framework (as presented in e.g. Malaga 1999). The overall framework is presented in the Scheme 1.

Scheme 1. Fundamental elements of the modeling framework

$\max_{C_t} U = \sum_{k=0}^{T-1} \frac{u(C_{t+k})}{(1+\rho)^k} + \frac{u(C_{t+T})}{\rho(1+\rho)^{T-1}}$	intertemporal utility $u(.)$ of private consumption C discounted (ρ) in finite horizon ($t = 1, ..., T$)
$Y_t \equiv C_t + J_t + G_t + (X_g - M_t)$	GDP identity (Y)
$Q_t = F_t(K_t, LP_t, A_t)$	potential output function (Q), Cobb-Douglas, CRS
$LP_t \equiv L_t - UN_t^*$	potential labour force LP
$(Y_t - Q_t)/Q_t = -alfa\left(\frac{UN_t}{L_t} - \frac{UN_t^*}{L_t}\right)$	Okun's Law
$\left(\frac{UN_t}{L_t} - \frac{UN_{t-1}}{L_{t-1}}\right) = \begin{cases} \varphi_{UP}\left(\frac{Y_{t-1} - Y_{t-2}}{Y_{t-2}}\right) \\ \varphi_{DOWN}\left(\frac{Y_{t-1} - Y_{t-2}}{Y_{t-2}}\right) \end{cases}$	dynamic Okun's gap with cyclical asymetries
$UN_t^* = UN_0 + \pi UN_t$	long-lasting unemployment (UN^*) evolution
$J_t = JG_t + JP_t$	investment outlays: (private JP and public JG)
$I_t(I + \varphi\frac{I_t}{K_t}) + \xi(I_t - I_{t-1})^2 = J_t$	adjustment costs to investment process
$K_{t+1} = (1-\delta)K_t + I_t$	capital (K) accumulation equation
$I_T \geqslant (g+\delta)K_T$	transversality condition
$JP_t \leqslant \frac{FDIMA_t}{m} + s^* Y_t - defG_t$	private investment financing with FDI inflow (two-years moving average) and domestic saving.
$B_t - B_{t-1} + dB_t \equiv defG_t \equiv G_t + JG_t + RES_t + pB_{t-1} - T_t - NT_t$	public sector budget balance

B – public debt, dB – other sources of financing the deficit (like privatization), $defG$ – deficit of general public sector, G – public consumption, JG – pro-growth investments (mainly in public infrastructure), ρB – costs of public debt financing, T – taxation, NT – non-tax public-sector incomes, RES – public redistribution, with residual public-sector expenditures.

Other simulation assumptions:

$L_t = L_0$	steady labour force stock (L)
$A_t = (1 + g_{UE})A_{t-1}$	exogenous technical progress (A)
$X_t = (1 + g_X)X_{t-1}$	steady-state growth of export (X) potential
$M_t = \mu Y_t + \nu FDI_t + o\sum_{\tau=1}^{t-1} FDI_\tau$	import (M) absorption of GDP with the impact of FDI inflows and stock
$T_t = \tau Y_t,\ NT_t = ntY_t,\ RES_t = readY_t$	steady proportion of taxation, semi-taxation, and redistribution economic policy

The supply side of the model is explained purely by neoclassical exogenous technology. The capital (K) is created according to the standard capital accumulation rule (with the steady depreciation rate δ – cf. capital accumulation equation in the Scheme 1). Additionally the adjustment costs in the process of investment transform the investment outlays (J) into net investments (I) as in Uzawa (1969) model and Piazolo (1998) study:

$$J_t = I_t(1 + \varphi\frac{I_t}{K_t}) + \xi(I_t - I_{t-1})^2. \tag{1}$$

We introduce the catching-up effect by connecting the technological progress ($A_t = (1 + g_{UE})A_{t-1}$) of the accessing economy with the rate of long-run growth of the European economy (denoted by g_{UE}) and leaving the initial capital-output ratio (K_0/Y_0) on the suboptimal level in relation to the developed economies of the EU-15 (cf. similar approach in Krkoska 1999). The potential output (Q) evolves with the accumulation of capital (K), persistent changes on the labor market (i.e. in potential labor stock LP), and exogenous technological progress:

$$Q_t = F_t(K_t, LP_t, A_t). \tag{2}$$

In modeling the demand side we have taken into account such initial problems of Polish economy as: 20% level of unemployment, low levels of participation rates, overdrawn 3% limit of budget deficit to GDP, growing public debt, shortages of capital funds on the domestic market. Firstly, we introduced the households maximizing the discounted sum of instantaneous utility of consumption extended by the adaptive habit formation behavior (as in Carroll and Weil 1994):

$$u(C_t) = \frac{(C_t/H_t^{\omega})^{1-\theta}}{1-\theta}. \tag{3}$$

with H_t evolving according to the rule:

$$H_{t+1} = H_t + \kappa(C_t - H_t). \tag{4}$$

The imbalance of labor market was approximated by the deviation of the unemployment rate ($un_t = \frac{UN_t}{L_t}$) from its normal rate ($un_t^* = \frac{UN_t^*}{L_t}$), which is one of the most popular representations of Okun's Law, usually derived from the output function (cf. Prachovny 1993):

(5) $$(Y_t - Q_t)/Q_t = -alfa(un_t - un_t^*).$$

The variable UN_t^* stands for quasi-equilibrium unemployment, and it denotes the number of long-lasting (above 1 year) unemployed in this study. It changes with the fluctuations in the number of unemployed population:

(6) $$UN_t^* = UN_0 + \pi UN_t, \quad 0 < \pi < 1.$$

The hysteretic process on the labor market is described by its reaction to the cyclical pattern of economic growth.[1] We assume that the change in the unemployment rate is negatively correlated with the one-year lagged growth rate of the economy:

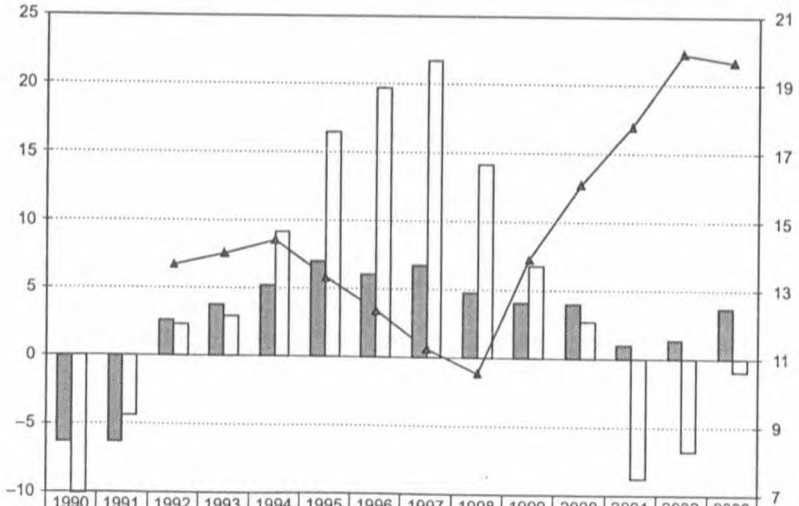
(7) $$(un_t - un_{t-1}) = \theta_0 + \theta_t(Y_{t-1} - Y_{t-2})/Y_{t-2} + \varepsilon_t, \quad \text{where} \quad \varepsilon_t \sim IID.$$

Further we introduced the variable parameters θ_0 and θ_1 regularly switched between two phases of the business cycle (i.e. accelerating growth phase UP, slowing growth phase DOWN). With $0 < \theta_{0,UP} < \theta_{0,DOWN}$, and $\theta_{1,UP} < \theta_{1,DOWN} < 0$ we get the hysteresis in unemployment. One could connect its occurrence to the restructuring processes (specific for economies in transition), cyclical technological diffusion, and/or labor market organization (price and contract rigidities). In effect the propagation of negative shocks in the downturn phase of the growth cycle leads to an increase in unemployment which remains high long after those cyclical shocks stop to operate. It can be shown that the regime-switching regression has more predictive power than any other single-factor equation of changes in unemployment. Although the OLS estimated parameter $\hat{\theta}_{1,DOWN}$ is above zero (with the insignificant estimate of $|\hat{\theta}_{1,DOWN}| < |\hat{\theta}_{1,UP}|$), an assumed pattern is firmly consistent with the Polish growth and unemployment observations (cf. Figure 1).

The significant OLS estimates of (7) say that 3.8% output growth rate is the minimum rate of job-intensive economic growth in the accelerating phase. The labor market dynamics (especially changes in long-lasting unemployment) indirectly affects the level of potential output according to the potential labor stock (LP) identity:

(8) $$UP_t \equiv L_t - UN_t^*.$$

[1] On the cyclical pattern of the Polish economy in the pre-accession period cf. Milo, et at. (2002).



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
GDP growth rate	−6.3	−6.3	2.6	3.8	5.2	7.0	6.1	6.8	4.8	4.1	4.0	1.0	1.4	3.7
investment dynamics	−10.1	−4.4	2.3	2.9	9.2	16.5	19.7	21.7	14.2	6.8	2.7	−8.8	−6.8	−0.9
unemployment BAEL			13.7	14.0	14.4	13.3	12.4	11.3	10.6	13.9	16.1	17.8	19.9	19.7

Fig. 1. GDP growth rate and unemployment rate relation.
Source: all data are Central Statistical Office (GUS) official numbers

The Scheme 1 presents very shortly other assumptions made in the simulation study. These are particularly the open-economy and investment questions which are not studied in this paper in full details. They are widely discussed in Szafrański (2004). In the Section 3 we will focus mainly on the alternatives to be confronted by the Polish economic policy in the EU perspective.

3. MAIN POLICY DILEMMAS AFTER EASTERN EU ENLARGEMENT

The economic policy problems of the year 2004 of EU Enlargement are more complex than they used to be when previous candidates were entering the EU (both in 1973, and in 1986). Firstly, the new EU-members have generally (except for Malta, Cyprus, and Slovenia) underdeveloped economies, which are still in the transition process to market structures and private-ownership rules. Secondly, the stage of the European integration process is much more advanced and demanding in the scope of policy regulations (internal EU policies) to be adopted and aims (EMU) to be achieved. Finally, the policy funds and support are not longer so generous as before and they are unlikely to rise.

During the Copenhagen Summit negotiations (December 2002) the potential levels of the EU-funds transfers to the accessing economies and payments due to the EU budget were decided (cf. Samecki 2003). In first 3 years of accession Poland could obtain at most 13.5 bln euro (potential payments in prices of 1999). The net value of all benefits could reach half of the sum which makes merely about 1% of the Polish GDP in 2006. The sum of the financial support is supposed to grow to about 4% of GDP in the next 6 years depending on the absorption capabilities of the accession economies (see Natolin and Gdańsk Institute reports of April 2003 for details). In this study we ask the question whether those thoroughly directed funds could distinctly foster the real convergence of Poland into the EU-15.

The lack of capital, technology, and investments are quite serious limitations to the steady-growth path of the accessing economies in transition. Thus the capital accumulation needs financial support from the external (FDI, trade deficit, EU funds) and internal sources (private savings, public expenditures and budget deficits). Some of them are strongly interconnected (e.g. high trade deficits are accompanied with significant budget deficits). The same refers to the accession support. High levels of fund absorption call for high public sector spending and they encourage significant sums of FDI inflows.

Moreover, many of the structural funds are of the following type – they offer low rates of return in the short run, and long-run investment periods till they could generate significant yield for economic agents and the whole economy. The strongly indebted accessing economies can find it difficult to undertake so long investment horizons. This could lead to the problems of current financing those investments (the gap is estimated to 7 bln euro in the first 3 years after the enlargement).

On the other hand the fiscal contraction is necessary to fulfill the Maastricht fiscal criteria in the medium and long run. These are not only recommended guidelines for the economies aiming to enter the Monetary Union, but first of all sound economic policy objectives of all the European countries. The EMU deficit and debt rules speak about at least the noticeable tendency of their reduction below 3% and 60% of GDP respectively. All of the acceding economies following these rules should be aware of the danger it carries for the EU-funds absorption capabilities. Thus too fast cuts of public expenditure could slow down the modernization of the economy by lowering the support to the transfers of structural funds.

Summing up the discussion we claim that the EU-absorption and fiscal criteria are contradictory to some extent. The Polish economy entering the EU is not free of those fiscal policy controversies. The Polish problems are especially important taking the initial level of budget deficit (above 5% of GDP), and public debt (above 50% of GDP and growing) into account.

4. POSSIBLE SCENARIOS OF THE ACCESSION POLICY

In the simulation study we decided to model the public finance sector only from the expenditure side and assumed that there are no significant changes to the budget income ratios, because of the high taxation of incomes and turnovers exceeding the socially accepted levels. Primarily, we distinguish different directions of the EU-financial inflows into the Polish economy. These are public investments *JG*, public consumption *G*, and redistribution *RES*. They are connected with certain types of economic policies and economic programs conducted with the help of different EU funds. We have distinguished two sides of the coin: the first side is demand one, and the second – supply one.

In the demand side we consider that EU-generated expenses (especially infrastructure outlays) are strongly import-absorbing. Thus we excluded from the net-demand increase the part of the Polish imports generated by the incoming funds. The rest of the net inflow (called domestic absorption) directly changes the demand Y_t by decreasing the output gap $(Y_t - Q_t)/Q_t$ in the Okun's relations formulated in (5). In the next step the increased growth influence the unemployment dynamics according to (7). Practically all of the transferred sums (both investment and redistributive) affect the economy in this way. Additionally, there are some co-financing and pre-financing flows generated by public sector to support the EU-funds. Although on the basis of Gilowska (2002) we assume that the financing sums would be partly redirected of existing budget positions, they were reduced in the base simulation proportionately to the cuts in the public spendings to meet the Maastricht criteria in the given period.

On the other hand the long-run supply-side effects are the outcome of those funds that are connected with the structural funds for investment projects. Especially important among them are "hard investments" in infrastructure (aiming at 42% of all structural funds) and in production sector (half of infrastructure investments). Of course the significant amount of the EU support does not refer strictly to the productive capital, but approximately 46% of them could be regarded as enhancing the potential output through externalities or social capital. We attempted to consider all of the above aspects introducing public investment outlays (*JG*) affecting the productive capital of the absorbing economy. In the exogenous version of the model (presented in this paper) we treat them as an important source of the capital accumulation. One can show that they are highly correlated with the private investments of both domenstic and foreign origin.[2]

[2] In the endogenous version (not presented in this paper, cf. Szafrański 2004 for details), we consider additional features of the separate public (infrastructure) capital *KG*. These kinds of capital treated as production externalities could be an important factor in the process of social production for all private economic agents.

To set the modeled economy on the planned paths of public deficit and debt we have assumed the reductions in the public sector expenditures and changes in its structure taking into consideration the social elasticity of different groups of expenses (from the most flexible public investment outlays *JG* to the less elastic redistribution expenditures *RES*). The reductions ussually influenced the arbitrary given EU-fund absorption ratios proportionally to the initial rate of different budget expenditures. In effect the path of the fiscal reform affects the optimal inter-temporal choice of consumers via the structure and the level of public financing. Having found the calibrated base solution of the simulation system we have analyzed the following accession scenarios in the next 20 years after entering the EU (2004–2023) (cf. Table 1).

Table 1. Simulation-study scenario assumptions

Secenario	EU-funds absorption	Date of entering the EMU
Pase scenario	negligent variant medium absorption (starting from 40–50% of payment limits)	2010 strict fiscal policy with the risk of delay
Fast-entry scenario	failur variant the lowest aborption starting from 25–30% in 2004	2008 severe fiscal policy
Slow-entry scenario	best variant highest absorption 63–68% of limits of 2004	2003 lenient fiscal policy changing constitution rules*

* In the scenario we considered the changes in the sound rules of fiscal policy (i.e. constitution limits of 50%, 55% and 60% level of GDP on public debt).

Additionally, we have assumed different paths of exchange rate on the basis of the risk situation observed on financial market. As useful rules for modeling exchange rates in the post-accession period we have chosen the following rules. Firstly, the longer EMU-entering period the higher real depreciation of the zloty to euro. Secondly, the closer to the entry period the less volatile the exchange rate, except for the significant depreciation on the year of entrance.

5. CONCLUSIONS

Drawing out the conclusions of those policy and macroeconomic assumptions on the basis of the simulation system, we can formulate some guidelines for conducting the fiscal policy in the accession period. We present all of the results in comparison to the base scenario as the medium-term benchmark.

As expected the fast-entry with rigid fiscal policy does not promote the long-run growth and accumulation of capital. Although the level of the output gap in the fast-entry scenario in the mid of the simulation period is lower than in the base scenario, the production potential grows faster in the base prediction from the very beginning. Thus effective output in the base prediction soon exceeds the figures from the fast-entry scenario after first 10 years of the accession (cf. Figure 2 and Table A1). The fast-entry predictions show the lower levels of EU-funds absorption as well. Gross absorption of funds reaches the peak of 4.5% GDP level in 2013 and then slowly falls down to the level below 3.5% in the next 10 years.

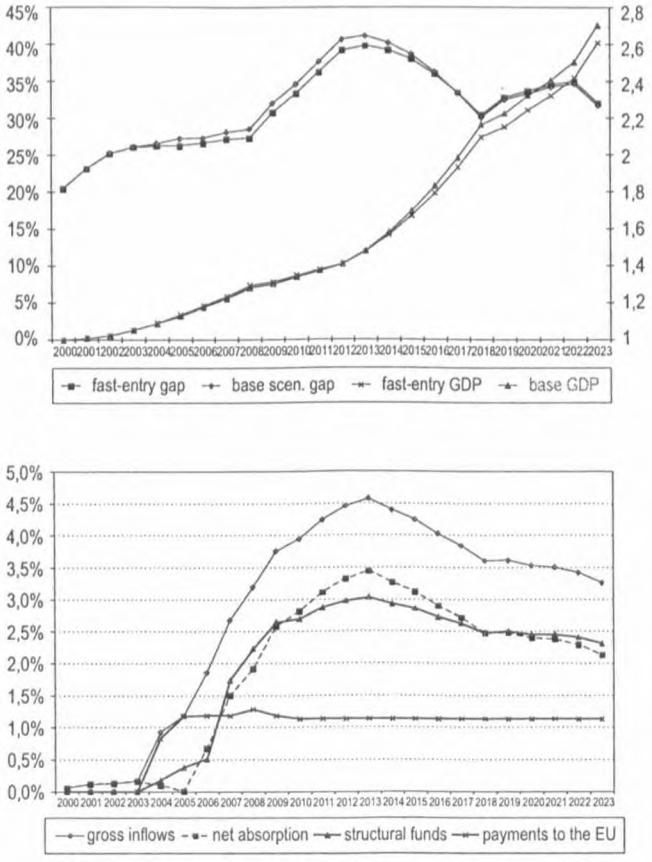


Fig. 2. Comparison of the base and fast-entry scenario – summary of the results. Note: GDP level (2000 = 1), output gap as % of production potential (left figure, EU-funds: gross, net absorption, structural funds, and payments as % of GDP (right figure)

On the other hand the slow-entry scenario generates very similar output path as the base one in the first 10 years (cf. Figure 3 and Table A2). After 2015 its negative deviation from the base prediction is less than 1% of current GDP and diminishes. At the end of the period the economy is on the higher growth path (the difference is less than 1%). The risk connected with the confirmation of the slow-entry scenario is, however, more serious and the assumptions made on the structure of the model more insecure. Nevertheless, in the scenario the 4% of GDP boundary on the structural funds level soon starts playing a role (in 2009), which effectively limits the net absorption of EU-funds to 4.5% of GDP (till 2016). The observation is strictly connected with the exchange rate level which increases zloty value of structural funds inflows to the institutional ceilings.

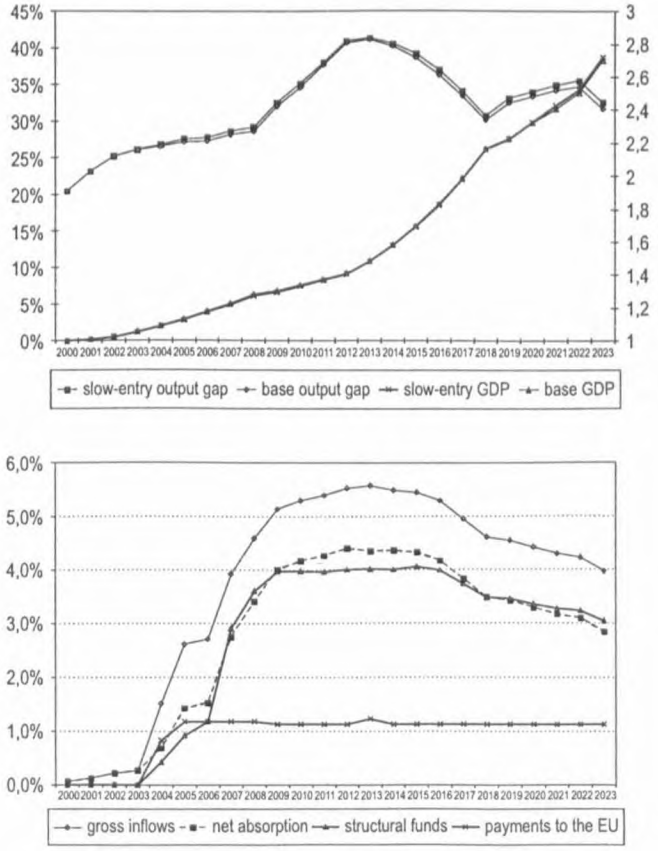


Fig. 3. Comparison of the base and slow-entry scenario – summary of the results. Note: GDP level (2000 = 1), output gap as % of production potential (left figure, EU-funds: gross, net absorption, structural funds, and payments as % of GDP (right figure)

Summing up the results, we must admit that in the short-run it is difficult to lower the Polish deficit to the EMU accepted level (3%). On the other side, omitting the fiscal problems (not reducing the expenditure from the very beginning) leads to more serious problems with the public debt ceilings (both in the Polish constitution and EU limits). Those could hamper the EU-funds absorption and cause new problems with fixing the exchange rate of zloty to euro at the proper equilibrium level. The convergence of the Polish GDP *per capita* to the EU standards is quite a long process. The simulation shows that after 20 years of accession the output gap still exceeds 27% of EU-15 level (the base scenario prediction with the growth of EU-15 GDP assumed at 2.5% a year).

APPENDIX

Table A1. The comparison of the fast-entry and base scenario (% deviations from the base prediction)

Year	C	J	I	GDP	RES	Q	M	G	$T+NT$	JG	K	Un	Un^*
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2002	0.00	0.00	0.34	0.02	0.02	0.00	0.01	0.02	0.02	–1.35	0.00	0.00	0.00
2003	0.10	–0.07	0.06	0.04	0.03	0.00	0.02	0.04	0.03	–1.64	0.00	–0.04	–0.05
2004	0.17	0.14	1.37	0.22	0.16	0.00	0.11	0.17	0.22	–5.12	–0.01	–0.06	–0.08
2005	1.57	0.04	0.76	0.79	0.02	0.03	0.37	–0.05	0.79	–7.15	0.01	–0.37	–0.50
2006	0.21	0.47	2.56	0.62	1.15	0.09	0.28	1.14	0.62	–6.81	0.01	–1.32	–1.76
2007	–3.47	–0.94	–4.02	0.87	2.96	0.10	–10.16	2.99	0.87	–11.33	0.05	–1.04	–1.40
2008	–1.60	–3.43	–10.50	1.04	3.69	0.07	–11.29	3.71	1.04	–12.79	–0.05	–1.47	–1.96
2009	–3.94	–4.57	–8.33	0.83	3.47	–0.13	–12.43	3.50	0.82	–14.01	–0.39	–1.18	–1.52
2010	–5.00	–5.48	–8.56	0.59	3.23	–0.36	–13.38	3.25	0.59	–15.05	–0.83	–1.22	–1.54
2011	–5.29	–6.28	–9.13	0.41	3.05	–0.62	–13.42	3.08	0.42	–14.85	–1.33	–1.27	–1.58
2012	–6.25	–6.90	–9.19	0.16	2.79	–0.91	–13.90	2.82	0.16	–15.21	–1.87	–1.28	–1.56
2013	–6.97	–7.28	–9.05	–0.32	2.29	–1.24	–13.72	2.32	–0.32	–14.62	–2.42	–0.98	–1.19
2014	–7.87	–7.56	–9.06	–0.89	1.71	–1.60	–13.89	1.73	–0.89	–14.55	–2.96	–0.41	–0.49
2015	–8.39	–7.80	–9.31	–1.52	1.45	–1.95	–13.56	1.37	–1.52	–13.72	–3.46	0.31	0.38

Table A1.

Year	C	J	I	GDP	RES	Q	M	G	$T+NT$	JG	K	Un	Un^*
2016	–9.31	–7.97	–9.26	–2.09	0.38	–2.29	–14.04	0.35	–2.09	–14.31	–3.93	1.19	1.49
2017	–9.96	–7.79	–7.83	–2.66	–1.65	–2.60	–13.68	–1.61	–2.66	–13.49	–4.37	2.16	2.75
2018	–10.91	–7.11	–5.13	–3.15	–4.31	–2.87	–13.69	–4.32	–3.15	–13.41	–4.74	3.40	4.49
2019	–11.29	–6.49	–4.53	–3.23	–4.39	–2.99	–13.38	–4.40	–3.23	–12.61	–5.00	2.72	3.50
2020	–11.71	–7.27	–4.05	–3.32	–4.48	–3.07	–13.38	–4.49	–3.32	–12.54	–5.15	2.58	3.30
2021	–12.07	–6.48	–3.49	–3.45	–4.61	–3.18	–13.06	–4.62	–3.45	–11.75	–5.36	2.44	3.10
2022	–12.51	–5.84	–3.21	–3.47	–4.63	–3.23	–13.32	–4.65	–3.47	–12.36	–5.46	2.31	2.93
2023	–12.28	–5.26	–2.67	–3.53	–4.69	–3.25	–12.85	–4.70	–3.53	–11.57	–5.50	2.58	3.36

Note: Mames of the variables given in the text.

Table A2. The comparison of the slow-entry and base scenario (% deviations from the base prediction)

Year	C	J	I	GDP	RES	Q	M	G	$T+NT$	JG	K	Un	Un^*
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2002	0.00	0.00	–0.56	–0.04	–0.04	0.00	–0.02	–0.04	–0.04	2.19	0.00	0.00	0.00
2003	–0.17	0.12	–0.11	–0.06	–0.06	0.00	–0.03	–0.06	–0.06	2.77	0.00	0.06	0.08
2004	–0.41	–0.18	–1.92	–0.20	1.05	0.00	–0.10	1.05	–0.20	7.21	0.01	0.10	0.13
2005	0.04	–0.89	–3.97	–0.34	1.00	–0.03	–0.16	1.00	–0.34	8.20	–0.01	0.34	0.45
2006	0.34	–1.67	–5.17	–0.47	0.97	–0.09	–0.22	0.96	–0.47	8.42	–0.09	0.57	0.76
2007	2.84	–1.68	–3.00	–0.58	–0.64	–0.18	4.27	–0.64	–0.58	4.80	–0.23	0.81	1.07
2008	1.72	–0.68	2.00	–0.74	–2.87	–0.27	4.93	–2.84	–0.74	5.03	–0.37	0.98	1.32
2009	0.99	0.05	2.47	–0.67	–4.00	–0.28	3.11	–4.05	–0.67	2.57	–0.40	0.75	0.96
2010	0.20	0.82	3.81	–0.65	–5.26	–0.26	2.29	–5.26	–0.65	1.84	–0.36	0.74	0.94
2011	–0.21	1.27	3.46	–0.41	–5.76	–0.19	0.71	–5.74	–0.41	–0.08	–0.23	0.69	0.85
2012	–0.55	1.57	3.31	–0.32	–5.68	–0.11	0.01	–5.65	–0.32	–0.73	–0.06	0.78	0.95
2013	0.89	1.08	–0.04	–0.14	–2.42	–0.01	0.48	–2.43	–0.14	–0.05	0.11	0.67	0.81
2014	1.57	0.85	0.08	–0.17	–1.11	0.07	2.12	–1.11	–0.17	2.52	0.22	0.46	0.56
2015	2.28	1.03	1.30	–0.30	–0.50	0.11	4.56	–0.54	–0.30	6.47	0.29	0.52	0.63

Table A2.

Year	C	J	I	GDP	RES	Q	M	G	$T+NT$	JG	K	Un	Un^*
2016	2.28	1.51	2.90	–0.38	–0.84	0.14	5.74	–0.90	–0.38	8.38	0.37	0.73	0.92
2017	1.94	2.17	4.52	–0.31	–2.00	0.20	5.79	–1.96	–0.32	8.36	0.49	0.91	1.16
2018	1.62	3.19	7.29	–0.15	–3.81	0.31	5.84	–3.85	–0.15	8.33	0.68	0.91	1.21
2019	1.86	4.05	7.54	–0.04	–3.70	0.44	6.00	–3.74	–0.04	8.28	0.94	0.96	1.24
2020	2.11	16.36	7.83	0.13	–3.54	0.62	6.12	–3.58	0.13	8.25	1.27	1.01	1.30
2021	3.12	1.91	8.63	0.89	–2.81	1.38	6.47	–2.84	0.89	8.21	2.70	1.10	1.39
2022	2.87	3.06	8.63	0.68	–3.01	1.30	6.43	–3.05	0.68	8.11	2.63	1.60	2.03
2023	2.70	3.96	8.74	0.64	–3.05	1.30	6.39	–3.09	0.64	8.07	2.67	2.08	2.71

Note: Table A1.

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POLITYKA GOSPODARCZA W KONTEKŚCIE AKCESJI DO UNII EUROPEJSKIEJ: PODEJŚCIE SYMULACYJNE

(Streszczenie)

W celu oceny prawdopodobnych skutków polityki makroekonomicznej wykorzystano typowe narzędzie ekonomii matematycznej, jakim jest model ekonomiczny i przeprowadzono analizę rozwiązań odpowiednio dostosowanego neoklasycznego modelu wzrostu. Modyfikacje podstawowego modelu Ramseya-Cassa-Koopmansa miały na celu wyjaśnienie za jego pomocą dobrze rozpoznanych empirycznych faktów – typowych dla rozwoju gospodarek w okresie transformacji, tj. braku równowagi na rynku pracy, cykliczności zmian, niedoborów na rynku dóbr konsumpcyjnych i kapitałowych. W celu przezwyciężenia słabości standardowego modelu, włączyliśmy do jego konstrukcji takie koncepcje ekonomiczne jak prawo Okuna, oraz uwzględniliśmy hipotezy o kształtowaniu zwyczajów konsumpcyjnych, o kosztach dostosowań inwestycji, o napływie zagranicznych inwestycji bezpośrednich i o akumulacji kapitału ogólnego użytku. Poruszone w symulacji problemy dotyczyły porównania skutków jednoczesnych i współzależnych decyzji o spełnianiu kryteriów fiskalnych Unii Gospodarczej i Walutowej (UGW) oraz o poziomie absorpcji funduszy europejskich dla wzrostu gospodarczego w kontekście zbieżności poziomu dochodów do średniego poziomu 15 krajów Unii Europejskiej.