

Do foreign direct investment and savings promote economic growth in Poland?¹

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Abstract: This study aims to investigate the impact of savings and foreign direct investment on economic growth in Poland. Savings play an important role in achieving sustainable growth. High saving rates are also an important tool to increase resilience to financial shocks. The economic climate that emerged following the financial crisis revealed problems with the economy of Poland to obtain foreign financing. The decrease in foreign direct investment has led to an unpredictable economic environment for developing countries such as Poland. The decrease in foreign direct investment has led to lower growth rates for an emerging market such as the economy of Poland. The relationship economic growth rate, saving and foreign direct investment are examined for Poland over the period 1992-2016 by using the Autoregressive Distributed Lag (ARDL) bounds testing approach. According to this approach there is a cointegration relationship between the series and a 1% increase in savings which leads to a 0.81% increase on economic growth rate. Also a 1% increase in foreign direct investment (FDI) leads to a 1.52% increase in the economic growth rate.

Keywords: economic growth, savings rate, foreign direct investment, ARDL bound testing.

JEL codes: E10, O47, O52.

Introduction

Savings are one of the main drivers of economic growth and are critical to financing investment and achieving growth targets. Growth levels achieved through domestic savings are more sustainable than growth rates obtained with capital borrowed. Furthermore, countries with high savings rates over a long time tend to have large and sustainable economic growth. Savings create capital formation and also lead to technical innovation and advancement

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that helps large-scale production economies and increases expertise, accelerates labour productivity (Jagadeesh, 2015). The main determinants of savings are the demographic structure, income level, growth rate, public sector savings, real interest rate, trade conditions, macroeconomic uncertainty, financial depth, financial liberalization, changes in household welfare and social processes (Kolasa & Liberda, 2014). In short the main determinant of a country's economic health is savings (Patra, Murthy, Kuruva, & Mohanty, 2017).

The relationship between savings and economic growth is important but it is a controversial issue for both academics and policy-makers. Many internationally renowned economists have analyzed this phenomenon as a cause-effect relationship. The neoclassical growth model reveals a clear link between savings and economic growth. Solow (1956) reveals that high savings lead to high investments, leading to economic growth. Harrod (1939) and Domar (1946) also assume that increased savings can promote economic growth through increased investment. Since investment is one of the main factors affecting growth the only way to increase it is to increase the savings rate of a country. The general impression is that the increase in total savings will lead to more investment in the short term with higher GDP growth. Therefore, a higher savings rate reduces consumption, increases capital and leads to higher economic growth rates (Bacha, 1990; De Gregorio, 1992; Gjergji, 2015). Another view suggests that economic growth encourages savings (Sinha & Sinha, 1998; Saltz, 1999; Agrawal, 2001). Strong economic macroeconomic policy recommendations for development have emerged in many countries as high savings contribute positively to economic growth (Sothan, 2014). A growth policy based on technological innovation, human capital and foreign trade policies is pursued in economies where economic growth encourages savings.

Foreign direct investment is another macroeconomic factor affecting economic growth. Technology provides a direct impact with valuable tangible and intangible assets such as capital formation and innovation capability (Findlay, 1978; Liu, Shu, & Sinclair, 2009; Wang, 2009). Investigating the causal link between FDI and growth has important implications for development strategies. A one-way causality from direct foreign investment to growth reveals a growth hypothesis that promotes income growth in host economies as well as capital formation and employment growth. The impact of foreign direct investment on the host country can be pursued at macro and microeconomic levels. The impact of foreign investment on host countries depends largely on the nature and amount of inflows. Foreign direct investment has a significant contribution to the economic development of developing countries and has great importance for developed countries (Nistor, 2014).

A low level of investment due to insufficient capital accumulation reduces the development of countries, their competitiveness with other countries and the living standards and welfare of their people. However, countries lacking sufficient savings can finance their capital needs either by borrowing or by for-

eign direct investment. Especially in developing countries the lack of domestic savings and the difficulty of foreign borrowing increase the importance of foreign direct investments. The need for foreign direct investment emerges as a result of the structural diversification of the global economy and the resulting competition but is mostly evident in the different levels of development of national economies. Less developed economies, developing or transition economies need foreign capital to accelerate economic growth (Nistor, 2014). The possible impacts of FDI on economic growth can be considered in four main categories (Zhang, 2006):

- increased capital accumulation and employment,
- encourages manufactured exports,
- management knowledge, know-how, the qualified labour force in the international production network and branding,
- technology transfer and spillover effects.

Figure 1 shows the trend of economic growth rates and Figure 2 shows the trend of foreign direct investments. Although economic growth rates have been positive in the last twenty-five years the recent difficulties in the economy of Poland have put growth rates at risk. Since 1992 the economic growth rate has averaged about 4% until 2016. Economic growth rates were affected by the global crisis in 2008. After this crisis, a sustainable and strong growth trend is not readily identified for the Polish economy.

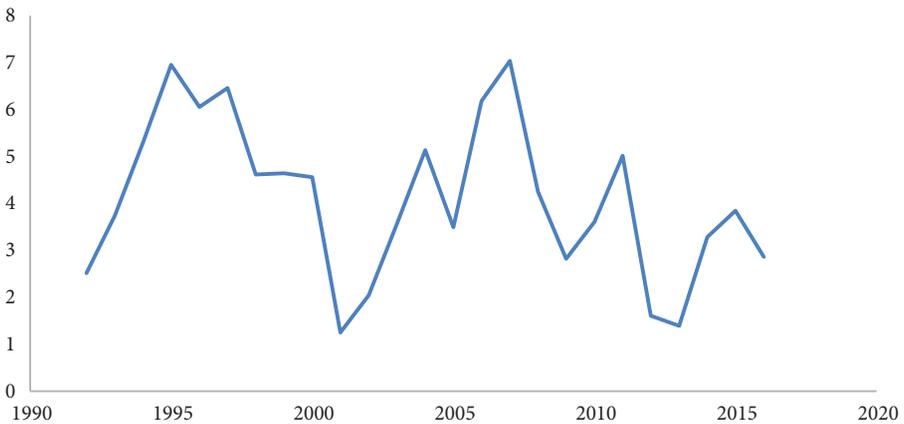


Figure 1. Economic growth rate in Poland

Source: World Bank Databank.

The problem of the elderly population in Europe is also an important economic, social and cultural problem for the Polish economy. The increasing ageing of the population has considerable significance for the development of the Polish economy and society. The ageing of the population will have inevitable effects on the labour supply, savings rates, and investment and capital accumulation.

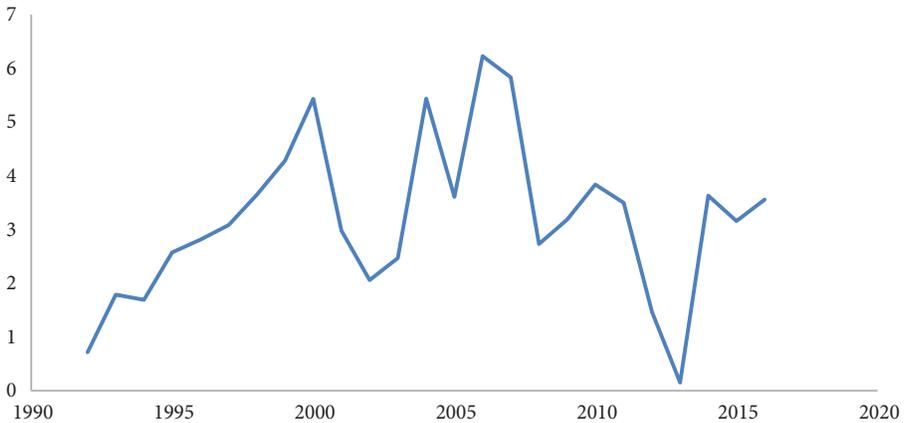


Figure 2. Foreign direct investment in Poland (% of GDP)

Source: World Bank Databank.

This study aims to reveal the effectiveness of foreign direct investments and savings in the Polish economy which have a significant impact on economic growth. It is emphasized that savings should be as important as foreign direct investments. The economic climate that emerged after the financial crisis revealed problems for the Polish economy to encourage foreign financing. The global crisis has caused the contraction of capital movements in particular. This has been a major problem in terms of the Eurozone that allows economic growth by means of foreign financing and where the borrowers have been forced to seek foreign finance to cover the debt. The decrease in foreign direct investment has led to an unpredictable economic environment for developing countries such as Poland. In short, low foreign finance has led to low growth rates for emerging markets such as the Polish economy.

According to the World Bank's 2014 report, an important issue for the growth rate of the Polish economy is the reduction of EU structural funds. It was also emphasized that the Polish government should adopt a savings-led growth model for sustainable growth. High domestic savings will help the Polish economy to finance its investments and achieve sustainable economic growth rates. The steps to increase the savings rate will also reduce the Polish economy's sensitivity to external developments.

The positive relationship between economic growth and savings has been revealed in many theoretical and empirical studies. Savings play an important role in achieving sustainable growth. The relationship between economic growth and saving is either unidirectional or bi-directional in many studies. The development of savings ratios is also an important development for financing opportunities. If savings are used effectively economic growth and capital stock will increase. High saving rates are also an important tool to increase resilience to financial shocks. As emphasized in the World Bank report, a strong

current account obtained through high national savings will cause Poland to acquire political independence as well as improve its international net investment position. In recent years Poland has not been able to save to finance its investment. It is also emphasized that Poland's savings rate lags behind most of European countries including the Czech Republic, Estonia and Slovakia.

In this study the relationship between economic growth, savings, and foreign direct investment is considered for the Polish economy for the period 1992-2016. There are not many studies in the literature that directly examine the effect of foreign direct investment and savings on economic growth. This study addresses this gap. This study is particularly important in terms of the impact of foreign investment and savings on growth in countries like Poland which needed external financing after the global crisis.

The rest of the study continues as follows: Section 1 explains the relationship between savings and economic growth theoretically and on which many studies have been carried out. Section 2 contains data and the methodology. The empirical findings and discussions are defined in Section 3. The conclusions of this paper are summarized in the last Section.

1. Literature review

The theoretical relationship between savings and economic growth is shown in Harrod (1939) and Domar (1946) growth models as. Harrod (1939) defined savings and investment as the defining variable. Harrod accepted savings as a determinant for achieving economic equilibrium. He also suggested that indicators such as investment, the marginal productivity of the capital and accelerators should be adjusted to the saving tendency. In the model Harrod (1939) defined savings as a function of national income. In the model investments are independent of factors such as planned savings, actual savings and actual investment. The use of the model consists of the warranted rate of growth, the actual growth rate and the natural growth rate.³ The Harrod-Domar growth model implies that the relationship between savings and growth is in a positive direction. Accordingly, countries need to increase their savings and investment rates for development.

The relationship between saving-economic growth is also evaluated within the framework of Solow (1956) and Romer's (1986) models. In the Solow model an increase in savings rates led to a temporary increase in per capita income during the transition to the new, steady state. Therefore in this approach the increase in saving-investment did not lead to economic growth. The increase in the savings rate has a positive effect on growth in the short term. The savings rate has no effect on the growth rate in the long term, in other words it implies

³ See Harrod (1939) for detail.

that the long-term growth rate is independent of saving. The savings rate has a long-run effect on growth rate in the Romer model, in other words an increase in saving rates leads to sustainable growth in the long run. Policymakers can achieve a sustainable growth rate by following a policy that promotes savings.

The theoretical and empirical studies that investigate the relationship between savings and economic growth, foreign direct investments and economic growth are based on different findings. Some of the studies that have examined the relationship between saving and economic growth, foreign direct investments and economic growth are as follows.

Developing countries with tremendous growth have taken great steps in closing the gap between developing countries and development (of what?) in the last two decades. In this context Bonga-Bonga and Guma (2017) investigate the relationship between savings and economic growth at the disaggregated level for South Africa over the period 1980-2011. Contrary to studies focusing on the overall impact of GDP growth on savings Bonga-Bonga and Guma (2017) contribute to the literature on savings and GDP growth in South Africa by comparing the magnitude of the saving trend between the household, institutional and government sectors in South Africa. The results of the empirical findings suggest that corporation savings play an important role on economic growth. The most important finding of the study is that the South African government should change its saving trends through a decrease in corporate tax.

Patra and others (2017) summarize the relationship between economic growth and saving in terms of the theoretical perspective. The Mill–Marshall–Solow view versus the Marx–Schumpeter–Keynes view emerged in line with the causality between saving and growth (Gutierrez & Solimano, 2007). In the Mill–Marshall–Solow approach all savings are automatically invested and converted to output increases for wage-price flexibility and full employment. Therefore the first view shows that saving leads to economic growth. In contrast the Marx–Schumpeter–Keynes view shows that investment and innovation are two important output factors. In this context savings are passively adjusted to meet the level of investment needed to achieve a macroeconomic balance and achieve a certain growth rate. In this respect growth leads to savings. Patra and others (2017) investigated the relationship between savings and economic growth in India over the period 1950-2012. They found that there is a break (of what?) in 1980 by using Bi-Perron test. Petra and others (2017) suggested that savings boost real activity in the long term and economic growth causes saving in the short term.

The growth rate in any economy depends on the level of investment made in different sectors of that economy and no significant investment can be made without saving. The total investment rate is generally higher than domestic savings due to the presence of foreign investment flows in Nigeria (Odionye & Ugwuebe, 2016). Odionye and Ugwuebe (2016), analyzed the relationship be-

tween domestic private savings and economic growth in Nigeria over the period 1980-2013 by using the Granger causality test. The findings demonstrate that there are a unidirectional causality and positive long-run relationships between domestic private saving and economic growth. These findings are based on the Solow growth model for the Nigerian economy. Odionye and Ugwuebe (2016) suggested that policymakers should take concrete steps to increase private domestic savings in Nigeria.

Developing countries are always limited by insufficient savings and investments; for example, economic development in sub-Saharan Africa is limited to insufficient savings and investments. Jagadeesh (2015) investigates the effect of savings on economic growth in Botswana over the period 1980-2013 and found that there is a long-term relationship between savings and economic growth based on the Harrod Domar growth model. The Harrold Domar model is an appropriate model to illustrate this relationship because the theory describes the mechanism by which more savings lead to more economic growth because savings lead to investment and the formation of capital for economic growth.

Today, many developing countries are trying to formulate economic policies to achieve low inflation rates, a manageable balance of payments deficit and high savings and investment rates to ensure economic growth. Poland is one of these developing countries with high inflation, low saving rates, low productivity, high import dependency and a worsening balance of payments (Eral, Tugcu, & Coban, 2014). Under these assumptions Er and others (2014), analyzed the relationship between saving, inflation and economic growth in the long and short run for Turkey over the period 2003-2012 with quarterly data by using ARDL. According to empirical findings economic growth and inflation play an important role for saving and saving, inflation and economic growth are cointegrated for Turkey. There is no relationship between inflation and savings in the short run and interest rates and saving in the long run according to their findings. They suggested that policymakers must reduce inflation to achieve sustainable savings.

A brief review of the literature on the relationship between savings and economic growth shows the positive relationship between domestic savings and economic growth (Katırcıoğlu & Naraliveya, 2006; AbuAl-Foul, 2010; Miształ, 2011; Najarzadeh, Reed, & Tasan, 2014; Turan & Gjerhji, 2014). This positive relationship is explained by several hypotheses. From the standpoint of the standard economic growth theory the positive cause-and-effect relationship between domestic savings and economic growth can arise without the need to use foreign investment in advanced economies where high domestic savings can be an important source of domestic investment and an economic growth factor. For the same reason there should be no relationship between domestic savings and economic growth in the poorest countries because these countries mostly use foreign savings (what are these?) to finance their investments, since their domestic savings are quite low (Misztal, 2011).

Table 1. Literature review

Author	Sample	Period	Methodology	Result
Cardenas and Escobar (1998)	Colombia	1925-1994	Granger casuality	Savings→EC
Saltz (1999)	selected countries	1960-1991	VECM	EC→Savings Savings→EC Savings×EC
Lensink and Morrissey (2001)	developing countries	1975-1988	Casuality	FDI→EC
Basu and others (2003)	developing countries		Panel cointegration	FDI↔EC
Alguacil, Cuadros and Orts (2004)	Mexico	1970-2000	Granger casuality	Savings→EC
Romm (2005)	North Africa	1946-1992	VECM	PSS↔EC
Mohan (2006)	selected countries	1960-2001	Granger casuality	EC→Savings Savings→EC
Zhang (2006)	China	1992-2004	Granger casuality	FDI→EC
Alfaro and Charton (2007)	OECD	1985-2000	Granger casuality	FDI→EC
Hemmi, Tabata and Futagami (2007)		1955-1990	ARCH	Savings→EC
Sajid and Sarfraz (2008)	Pakistan	1973-2003	VECM	Savings→EC
Odhiambo (2008)	Kenya	1991-2005	Granger casuality	Savings↔EC
Abu (2010)	Nigeria	1970-2007	Granger casuality	EC→Savings
Masih and Peters (2010)	Mexico	1960-1996	VAR	Savings→EC
Singh (2010)	India	1950-2002	ARDL	Savings↔EC
Alimi and Ibrinke (2012)	Nigeria	1970-2006	Granger casuality	Savings→EC
Alomar (2013)	selected 6 countries	1980-2010	Granger casuality	EC→Savings Savings→EC
Sothan (2014)	Cambodia	1989-2012	Granger casuality	Savings→EC
Budhedeo (2015)	India	1950-2013	VECM	Savings↔EC

* EC: Economic Growth; PSS: Private Sector Saving; FDI: Foreign Direct Investment; →: unidirectional relation; ↔: bidirectional relation; ×: no relation

Source: Author's compilation.

The contribution of foreign direct investment to economic growth is discussed extensively in the literature. This discussion is focused on channels where foreign direct investment could help boost growth in recipient countries (Hermes & Lensink, 2003). Technological diffusion and capital formation are the primary focus of attention in the analysis of economic growth. Technology diffusion can take place through a variety of channels, and foreign direct investment (FDI) has been recognized as one of the main channels for access to advanced technologies (Choe, 2003). Empirical studies such as those by Karimi and Yusop (2009), Khaliq and Noy (2007), Sarkar (2007), Basu, Chakraborty and Reagle (2003), Choe (2003) found that FDI is positively correlated with economic growth. Table 1 contains other studies and findings that examine the relationship between savings or foreign direct investment and economic growth.

Savings are one of the most important components of economic growth and therefore the saving rate has an important place in the theories of economic growth. On the other hand with the globalization in the world foreign direct investment movements have gained in importance and since the 1990s foreign direct capital movements have increased significantly. As stated above extensive studies have been conducted to examine the relationship between savings, foreign direct investment inflows and economic growth. However there have been few studies investigating the effects of both domestic savings and foreign direct investment on economic growth. The relationship between FDI flows and savings-investment behaviour of host countries was analyzed for sample countries with the help of a simple statistical exercise (Papanek, 1973; Alamgir, 1974; Dhar & Roy, 1996; Katircioglu & Naraliyeva, 2006; Rajabova, 2013). In general, the analysis showed that foreign capital movements had a positive effect on savings and income in total and at the sectoral level.

This study contributes to the literature by examining the effects of savings and foreign direct investment on economic growth in Poland during the period 1992-2016. The next sections empirically reflect the impact of foreign direct investment and savings on economic growth. Foreign direct investment and savings may contribute to economic growth for the Polish economy.

2. Data and Methodology

2.1. Data

The main aim of this study is to examine the relationship between the economic growth rate, saving and foreign direct investment for Poland over the period 1992-2016 by using the Autoregressive Distributed Lag (ARDL) bounds testing approach. The data is obtained from the World Bank Databank.

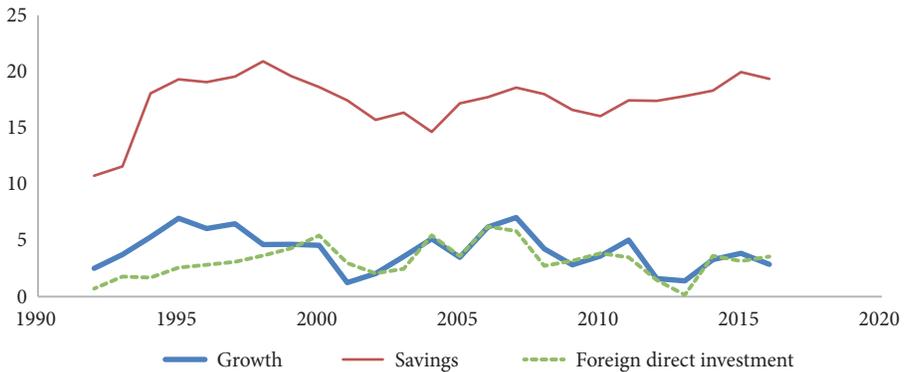


Figure 3. Growth rate, saving rate and foreign direct investment in Poland (% of GDP) in 1992-2016

Source: World Bank Databank.

Figure 3 reflects the economic growth rate, savings and foreign direct investment (FDI) for Poland. The left axis reflects the rate of growth, saving and foreign direct investment the horizontal axis reflects the years.

The sustainable economic growth rate is important for Poland. Should foreign direct investment or savings be encouraged for sustained growth? The answer to this question is important for the Polish economy and the answer is quite obvious. Of course national savings should be increased in order to be less influenced by developments in international capital movements and in the rest of the world. This topic will be covered in more detail in the conclusion.

2.2. Methodology

Cointegration tests are used in examining the long-run relationship between variables. In particular Engle-Granger (1987), Johansen (1988) suggest that there may be a stationary combination of two variables that are found to be non-stationary at the level of cointegration tests. Engle-Granger and Johansen (1988) tests require variables to be stationary at the same level. However this constraint, which is an important obstacle in practice can be explained by the Peseran, Shin and Smith (2001), and the “ARDL” approach which reveals the relationship between the various varieties of integrated variables. The fact that the variables to be used in the model are stationary I (0) or stationary I (1) in the first instance does not preclude the application of the boundary test. Since the ARDL boundary test uses the unrestricted error correction model it gives statistically more reliable results. The most important feature of the error correction model is that it contains information about the short- and long-term dynamics of the variables (Akel & Gazel, 2014).

The unrestricted error correction model for the ARDL boundary test is defined as follows:

$$\Delta Growth = \alpha_0 + \alpha_1 t + \sum_{i=1}^m \alpha_{2i} \Delta Growth_{t-i} + \sum_{i=0}^m \alpha_{3i} \Delta Savings_{t-i} + \sum_{i=0}^m \alpha_{4i} \Delta FDI_{t-i} + \alpha_5 Growth_{t-1} + \alpha_6 Savings_{t-1} + \alpha_7 FDI_{t-1} + \mu_t \quad (1)$$

(*Growth*) represents economic growth rate, (*Savings*) represents gross national savings (% of GDP), (*FDI*) represents foreign direct investment (% of GDP), α represents constant, Δ represents the first difference operator and μ_t represents error term.

The ARDL bounds test follows the estimation of regressions to obtain the optimal lag length for each variable. An appropriate lag selection is chosen based on the Akaike information criterion (AIC) (Bildirici, 2013). To test the existence of the cointegration relation the *F* test is applied to the first differences between dependent and independent variables. The null hypothesis for this test is as follows:

$$H_0 = \alpha_4 = \alpha_5 = 0 \text{ (No long-run relationships exist).}$$

$$H_1 = \alpha_4 \neq \alpha_5 \neq 0 \text{ (Long-run relationships exist).}$$

The *F* statistics in the ARDL boundary test method are determined according to the lower and upper values in the study of Pesaran and others (2001). If the value obtained from the analysis is smaller than the calculated subcritical value of *F* it is considered that there is no cointegration relationship between the series. If the value obtained is larger than the upper critical value, the existence of the cointegration relationship can be mentioned. However if the value lies between the lower and upper critical values then no decision on cointegration can be made. The ARDL models are defined to determine the long term and short term relationships of the variables when the cointegration relationship is obtained between variables as a result of the boundary test result.

An ADF test was used for the unit root test. The Augmented Dickey-Fuller Test results will be included in the next section. The results of the boundary test will be shown as tables. If the cointegration relationship is obtained then the estimation results of long and short term ARDL model will be given.

3. Empirical findings and discussion

The stationarity is very important in the time series analysis. The Augmented Dickey-Fuller (ADF) test is the most commonly used unit root test. The Augmented Dickey-Fuller (ADF) unit root test is used to determine whether the variables are stationary or not. Table 2 reflects the results of unit root tests

for economic growth rate, savings (% of GDP) and foreign direct investment (FDI) (% of GDP).

Table 2 shows that the economic growth series is stationary at the level while savings and FDI series are not stationary as level. The first differences in these two series have been considered as to stationary. Table 3 reflects the results of unit roots for savings and FDI series at the first difference.

Table 2. Unit root results (at level)

Augmented Dickey Fuller			
	Growth	Savings	FDI
<i>t</i> -statistic	-4.746149	-3.134479	-3.200255
Probability	0.0066*	0.1212**	0.1079**
Critical Values			
1%	-4.532598	-4.394309	-4.394309
5%	-3.673616	-3.612199	-3.612199
10%	-3.277364	-3.243079	-3.243079

H_0 = Growth has a unit root

H_2 = Savings has a unit root

H_4 = FDI has a unit root

* The H_0 hypothesis is rejected because the probability value is smaller than 0.05, the series is stationary.

** The H_2 and H_4 hypothesis are accepted because the probability value is bigger than 0.05, the series is not stationary.

Source: Calculated by Eviews.

Table 3. Unit root results of savings (% of GDP) and FDI (% of GDP) (at first difference)

	Savings	FDI
<i>t</i> -statistic	-4.057605	-5.680387
Probability	0.0211*	0.0007*
Critical Values		
1%	-4.416345	-4.416345
5%	-3.622033	-3.622033
10%	-3.248592	-3.248592

H_0 = Savings has a unit root

H_2 = FDI has a unit root

* The H_0 and H_2 hypothesis are rejected because the probability value is smaller than 0.05, the series is stationary.

Source: Calculated by Eviews.

To summarize the results of the unit root tests: the economic growth rate is stationary at level I (0), savings and foreign direct investments series are stationary at the first level I (1). In this case the ARDL test can be applied.

The first step of the ARDL model is to determine the appropriate lag length. Critical values such as those proposed by Akaike, Schwarz and Hannan-Quinn are used to determine the lag length. The lag length providing the smallest critical value is determined as the lag length of the model. The optimal lag length was determined as 6 based on Akaike (AIC).

The F statistics are used to determine the existence of the cointegration relationship between the series after determining the lag length. The F statistics in the ARDL boundary test method are determined according to the lower and upper values in the study of Pesaran and others (2001). The results of the ARDL boundary test and diagnostics test results are given in Table 4.

Table 4. ARDL bounds test and diagnostic test results

<i>k</i> (independent variable)	<i>F</i> -statistic	I(0) Bound (1%)*	I(1) Bound (1%)*
2	200.9925	5.15	6.36

Null Hypothesis: No long-run relationships exist.

* I (0) indicates the lower bound, I (1) indicates the upper bound at the 1% level.

Source: Calculated by Eviews.

There is a cointegration relationship between the variables when the bounds test results are examined. After this result the long-run term relationship between the variables in the ARDL model will be examined. The long-run relationship between the variables is shown as follows (2) with the ARDL error correction model.

$$Growth_{1t} = \alpha_0 + \sum_{i=1}^m \alpha_{2i} \Delta Growth_{t-i} + \sum_{i=0}^m \alpha_{3i} \Delta Savings + \sum_{i=0}^m \alpha_{4i} FDI + \mu_t \quad (2)$$

The AIC information criterion was used in determining the lag length in the study and the long-term predicted model was the ARDL (6, 4, 4) model. Table 5 represents the ARDL Cointegrating and Long Run Coefficients.

The long term coefficients of the model have the anticipated signs and are statistically significant. According to long-run coefficients 1% increase in savings leads to a 0.81% increase on economic growth rate. In addition to this a 1% increase in foreign direct investment (FDI) leads to a 1.52 % increase in the economic growth rate.

The estimation results of the ARDL model in equation 1 is in Table 6.

Table 5. ARDL (6,4,4) ARDL cointegrating and long run coefficients

Variable	Coefficient	t-Statistic
D(Growth(-1))	0.460090	0.0111
D(Growth(-2))	0.354707	0.0224
D(Growth(-3))	0.152019	0.0919
D(Growth(-4))	0.468254	0.0201
D(Growth(-5))	-0.128609	0.0945
D(Savings)	0.849270	0.0197
D(Savings(-1))	-0.446494	0.0272
D(Savings(-2))	0.991244	0.0027
D(Savings(-3))	-0.938858	0.0042
D(FDI)	0.901191	0.0022
D(FDI(-1))	-0.784680	0.0024
D(FDI(-2))	0.145281	0.1931
D(FDI(-3))	-0.668876	0.0287
CointEq(-1)	-1.039382	0.0022
Long Run Coefficients		
Variable	Coefficient	t-Statistic (probability)
Savings	0.814584	5.372991 (0.0329)
FDI	1.524834	8.099678 (0.0149)
C	-15.873789	-4.783801 (0.0410)

D represents the first difference operator.
The probability values are in parentheses.

Source: Calculated by Eviews.

Table 6 shows the diagnostic test results of the estimated ARDL (6, 4, 4) model at the same time. It is clear that the model does not have any autocorrelation (Breusch-Godfrey LM Test), heteroscedasticity (ARCH LM Test) problem and the error term has a normal distribution (Jarque Bera Normality Test).

Conclusions and recommendations

In this study the relationship between economic growth and the savings rate and foreign direct investment has been examined over the period 1992-2016 for Poland. In other words, the contribution of foreign direct investment and savings to economic growth is examined. The economic growth series is stationary

Table 6. ARDL (6, 4, 4) estimation results

Variable	Coefficient	t-Statistic	Probability
Growth(-1)	0.420708	12.12629	0.0067
Growth(-2)	-0.105383	-3.344289	0.0790
Growth(-3)	-0.202688	-4.358605	0.0488
Growth(-4)	0.316236	3.652001	0.0675
Growth(-5)	-0.596863	-13.21615	0.0057
Growth(-6)	0.128609	3.018313	0.0945
Savings	0.849270	7.020058	0.0197
Savings(-1)	-0.396715	-6.284216	0.0244
Savings(-2)	0.446494	5.935726	0.0272
Savings(-3)	-0.991244	-19.03971	0.0027
Savings(-4)	0.938858	15.34513	0.0042
FDI	0.901191	21.34008	0.0022
FDI(-1)	-0.624582	-14.47996	0.0047
FDI(-2)	0.784680	20.44051	0.0024
FDI(-3)	-0.145281	-1.932127	0.1931
FDI(-4)	0.668876	5.771527	0.0287
C	-16.49892	-4.416402	0.0476
Diagnostic Tests	Statistics		
R-squared	0.999682		
Adjusted R-squared	0.997135		
F-statistic	392.5346	Prob. (0.002544)	
Breusch-Godfrey LM	18.36440	0.3030	
ARCH LM	6.548379	0.3646	
Jarque-Bera	1.078335	0.583234	

Source: Calculated by Eviews.

at an equilibrium, the savings rate and foreign direct investment growth series are stationary at the first level. The ARDL boundary test and long term cointegration coefficients were used as estimation method in this paper. According to the results of the analysis it was found that there is a relationship between variables in the long term as emphasized in the empirical findings and that a 1% increase in savings leads to a 0.81% increase in the economic growth rate. In addition to this a 1% increase in foreign direct investment (FDI) leads to a 1.52 % increase in the economic growth rate. Foreign investments are the

driving force for economic growth in Poland. This study showed that national savings are also a force for economic growth and these results support the hypothesis that policies that try to improve foreign investment are an effective way to stimulate economic growth.

The relationship between economic growth and FDI and economic growth and savings have also found wide application in the literature. FDI has gained significant importance in the last decade as a means of accelerating the growth and development of transition economies. As highlighted in the literature section almost all research has found that FDI has a positive impact on economic growth and accelerates growth and development, while providing technology, managerial skills and market entry. On the other hand the theoretical relationship between savings and economic growth takes place in Harrod (1939) and Domar (1946) growth models. The relationship between saving-economic growth is also evaluated within the framework of Solow (1956) and Romer (1986) models. The results obtained from this study are consistent with the hypotheses of Harrod (1939), Domar (1946) and Romer (1986) because savings have a positive impact on economic growth in the Polish economy according to the test results. The impact of foreign direct investment on growth is also consistent with Karimi and Yusop (2009), Khaliq and Noy (2007), Sarkar (2007), Basu and others (2003) as foreign direct investment has a positive impact on economic growth in Polish economy.

The driving forces behind economic growth are exports, foreign direct investment and the structural EU funds in Poland. Poland's economic growth cannot be sustained unless based on exports, foreign direct investment and European Union funds under a changing economic environment. The role of Direct Investment in Poland is crucial in boosting the country's economic growth and therefore policymakers need to pay special attention to the creation of specific policies to attract foreign investors to the country. This will lead to further savings and promote economic growth. Policymakers should ensure that adequate macroeconomic policies are in place to open the economy so as to encourage foreign direct investment inflow and make Poland an export platform for the established international market in which export goods can be produced. This will help to strengthen Poland's trade volume and ensure private savings.

The Polish economy needs a new growth model through by national savings. The new policy aspect is to promote savings as the main engine of economic growth. A strong commitment to savings is critical to macroeconomic stability and sustainable long-term growth at a time when FDI becomes more competitive. Governments attach importance to the increase in savings to make new investments, to produce new capital goods and to sustain economic growth. Realisation of export-based economic growth by increasing productivity, technological innovation, reducing dependence on imports and increasing exports of new and high value-added products can be identified as policies to be fol-

lowed to increase domestic savings. Polish private and household savings also respond more to changes in state savings. Moreover the negative impact of changes in corporate savings on household savings is attractive compared to other European countries. In the case of private savings the positive effect of private disposable income and the rise in consumer prices is relatively strong in Poland (Kolasa & Liberda, 2014).

Effective channels need to be available to transfer domestic savings to productive investments. Domestic savings should be reserved for high value-added sectors and public aid programmes should be appropriately controlled to avoid unnecessary expenditure on inefficient areas.

The economic slowdown due to the financial crisis has revealed the shortcomings of the economic growth model of the Polish economy which based on external financing. The weakening of economic performance following the financial crisis indicates that a new growth model for Poland is needed by promoting simplified national savings. Therefore the savings-based growth model is a worthwhile model for Poland.

The findings of this study strongly demonstrate the significant impact of FDI and savings on the diversification of economic growth in Poland. Poland should benefit more from the foreign direct investment when considering the contributions to the growth of a direct foreign investment. It is clear that if foreign direct investments to Poland are in the form of new investments that create employment, technology and high added value, it will contribute more to economic growth. However, it should not abandon the savings against global fluctuations. It is necessary to increase the saving rate to protect the economy against financial shocks. It is also necessary to increase the saving rate for sustainable growth. Sustainable growth can be achieved by providing savings in combination with several complementary policies. Thus the negativities experienced in external financing can be reduced to the minimum level through a savings' increase.

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