



THE IMPACT OF STRUCTURAL REFORMS AND BUDGET DEFICITS ON THE  
ECONOMIC GROWTH IN THE EUROZONE

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*Abstract*

*After the financial crisis in 2008, the economic recovery of Eurozone countries has been slow. This paper compares the impact of structural reforms and deficit spending on gross domestic product after a major economic downturn using the panel vector autoregression model. This paper shows that structural reforms in the product and labor markets had a significant effect on the growth of gross domestic product (GDP) in the Eurozone. Results also indicate that improving financial openness has a positive impact on economic growth; however, budget deficits have a larger effect on GDP than structural reforms. This implies that increasing budget deficit is a better way to stimulate the economy than structural reforms. The paper further quantifies the impact of reforms. Budget deficits have the highest effect on GDP, followed by improving competitiveness of product markets, then improving the flexibility of labor markets and financial openness.*

*Keywords: structural reforms, Eurozone crisis, financial crisis, economic growth, product markets, labor markets, financial openness*

*JEL Classification: H10, H62, O10*

## I. INTRODUCTION

The financial crisis in 2008 showed that the Eurozone is vulnerable to negative financial shocks. A lack of structural reforms in a period before the financial crisis may have contributed to a slower pace of economic recovery. This paper defines structural reforms as a collection of product market reforms that improve the functioning and competitiveness of product markets, labor market reforms that improve the flexibility of labor markets and reforms that improve financial openness. In the years prior to the financial crisis when there was strong economic growth, there was almost no interest in some Eurozone countries to focus on structural issues in their economies. After the financial crisis, policymakers in the Eurozone emphasized structural reforms for some European countries as a way to accelerate economic recovery. Some countries enacted recommended reforms, while others did not. It is also evident that some Eurozone countries experienced a faster pace of economic recovery. However, it is not clear whether structural reforms helped accelerate recovery or not. Even though it is difficult to predict when a new crisis will come, previous experience of cyclical movements in the business cycle suggest



that it is inevitable that a new crisis will emerge in the Eurozone at some point in the future. Countries that do not improve structural issues may experience more severe issues during the financial crisis. That is why highlighting these vulnerabilities should be a focus for policymakers in the Eurozone. How structural reforms affect gross domestic product (GDP) growth in short and medium term in Eurozone countries is still an unanswered question. Economic literature does not provide a definitive answer, because similar research for Eurozone countries are rare and inconsistent. This paper aims to improve economic literature by analyzing key dynamics to how structural reforms impact GDP growth over time. The paper is organized as follows: in the next section is the literature review. The third section outlines the methodology. The fourth section presents the empirical results and the fifth section concludes with empirical findings and policy implications.

## II. LITERATURE REVIEW

Previous economic research focused on the long-term impact of structural reforms on economic growth. Most of the research showed that improving functioning of product markets, labor markets and financial openness has a positive impact in the long term. However, economic literature is scarce and inconclusive when it comes to the short and medium term impact of these reforms. It may be possible to compare the positive impact of structural reforms on economic growth with economic loss from a financial crisis. Fatás (2016) finds that the benefits of product market and labor market reforms could be as high as 5 to 20 per cent of gross domestic product (GDP), while productivity could increase up to 14 per cent. Fatás concludes that the benefits of structural reforms could undo all economic damage from a sharp downturn after a financial crisis. Bassanini, Scarpetta and Hemmings (2001) find that overregulation in product markets has a negative impact on efficiency, which negatively affects the growth of gross domestic product. Anderson, Barkbu, Lusinyan and Muir (2016) conclude that by improving their product markets, Eurozone countries could increase their GDP by 0.7 per cent in the first year and 3.3 per cent after five years. Authors also find that this effect could increase to 11 per cent in the long-term. Scarpetta, Hemmings, Tresselt and Woo (2002) find that easing the burden on entry of new firms has a positive impact on improving productivity. Alesina et al. (2003) have discovered a negative relationship between regulation and investment; they conclude that reducing barriers to entry for new firms would lead to new investments. Cincera and Galgou (2005) find that increasing the number of new firms leads to higher growth rates, employment, investments in research and development; it also has a positive impact on labor productivity. They conclude that reducing price controls, import barriers, increasing quality of regulations and making it easier to start a new firm have a positive impact on the entry and exit of firms in markets. Alesina, Ardagna and Galasso (2008) find that European countries improved product markets more than labor markets and it was easier for their governments to enact structural reforms during periods of bad economic performance. Adascalitei and Pignatti Morano (2015) find that in developed countries, governments usually enact structural reforms after an economic crisis and during periods of high unemployment. Authors find that in developing countries, governments decide to implement structural reforms during periods of



strong economic growth. Economic literature does not have a consensus view about the timing of reforms. Some authors think that it is better to implement product market reforms before labor market reforms. Blanchard and Giavazzi (2001) think that European countries should first deregulate product markets, because it would then be easier to implement labor market reforms. They conclude that reducing rents in uncompetitive product markets could reduce the pressure of existing firms and labor unions to labor market reforms. McQuinn and Whelan (2015) find that labor market reforms could increase GDP growth in the Eurozone by 0.13 per cent a year, 0.35 per cent in Spain and 0.28 per cent in Greece from 2014 to 2023. Duval and Furceri (2018) find that reducing tax wedge on labor has a positive impact on economic growth during recessions. Authors conclude that reducing labor protections and unemployment insurance has a positive impact during periods of strong economic growth, but can be negative during recessions. Economic literature does not show a clear relationship between financial openness and economic growth. Obstfeld (2008) finds that despite numerous studies, there is little compelling evidence on how improving financial openness in developing countries has a positive impact on economic prosperity or growth rates. However, Fratzscher and Bussiere (2004) think that it is difficult to establish a direct link between financial openness and economic growth because countries usually have benefits of improving financial openness in the short run, but afterwards that relationship becomes negative. Improving financial openness does not necessarily need to be positive for an economy. Short-term movements in capital flows could increase uncertainty and increase asset price volatility. In that case, liberalizing capital markets could lead to short-term economic instability. Stiglitz (2004) concludes that improving financial openness contributed to previous financial and economic crises in developing countries. Stiglitz finds that capital outflows during financial crises lead to worsening economic outlook. Kose, Prasad and Terrones (2008) find that direct foreign investments and portfolio investments increase total factor productivity. Authors conclude that improving financial openness could improve the allocation of resources from less productive producers to more productive, as well as increase the number of new firms. Chinn and Ito (2006) conclude that financial openness improves growth of equity markets, but only if institutions are developed prior to financial reform. They find that trade openness is a prerequisite to improvement of the financial system and developing a banking system is a prerequisite to development of equity markets. Chinn and Ito (2008), in their later paper, present a new index to measure financial openness. Bekaert, Harvey and Lundblad (2001) find that the liberalization of equity markets, on average, increases real GDP by 1 per cent a year over five years. In their later paper, Bekaert, Harvey and Lundblad (2011) conclude that improving financial openness has a larger impact on productivity than capital growth. If structural reforms could lead to growth in investments and productivity, then it could also lead to economic growth.

### III. METHODOLOGY

This paper uses the panel vector autoregression model (PVAR) to estimate the impact of structural reforms and deficit on changes in gross domestic product in Eurozone countries after the 2008 financial crisis. PVAR models increase degrees of freedom due to analysis of panel



data. This allows us to better model data heterogeneity from different Eurozone countries. All variables in the PVAR model are endogenous. We estimate the following PVAR model:

$$Y_{it} = AY_{it-1} + e_{it}$$

Where  $A$  is a matrix of parameters that shows the relationship between the matrix of endogenous variables  $Y_{it}$  in time  $t$  and the same matrix from a previous period  $t-1$ ; and  $e_{it}$  is a residual matrix. Index  $i$  shows Eurozone countries. The model uses data from all Eurozone countries. Matrix  $Y$  consists of the following variables: gross domestic product (GDP) growth rate, index "Goods market efficiency", index "Labor market efficiency", Chinn-Ito index, unemployment rate, Harmonized Index of Consumer Prices (HICP), budget deficit as a percentage of GDP and interest rate on 10-year government bonds. The paper uses this data for each Eurozone country in period between 2007 and 2017. Data for GDP growth rate, unemployment rate, Harmonized Index of Consumer Prices (HICP), budget deficit as a percentage of GDP and interest rate on 10-year government bonds are from the Eurostat database. Index "Goods market efficiency" and index "Labor market efficiency" are from the Global Competitiveness Report publication. The model uses Chinn-Ito index as a measure of financial openness. Data for Chinn-Ito index time series is from publication authored by Chinn and Ito. Index consists of binary dummy variables that measure limits on financial transactions between countries. Index "Goods market efficiency" shows how the competitive goods market is in a country and consists of 16 subindices (Schwab and Sala-i-Martin, 2016). Index "Labor market efficiency" shows how the competitive labor market is in a country and consists of 10 subindices (Schwab and Sala-i-Martin, 2016). This paper uses lags of endogenous variables and estimates coefficients by the least squares method. After estimating the panel VAR model, the next step is to calculate the variance decompositions (VDs) and impulse response functions (IRFs). Variance decomposition shows the contribution of shocks to the variance of each variable and helps to interpret the model. Impulse response functions help to determine a dynamic response of each variable on the panel VAR system. Both approaches are useful in measuring how shocks in product markets, labor markets, financial openness and deficit affect other macroeconomic variables. To determine IRFs and VDs, it is important to identify shocks. A common method is the Cholesky decomposition to orthogonalize residuals. This method requires the choice of a specific order of variables. Exogeneity criteria determine the chosen order of endogenous variables, i.e., the most exogenous variable is in the first place and less exogenous variables are at the end. Economic literature does not unanimously provide a clear choice of ordering variables using Cholesky decomposition. This panel VAR model assumes the following ordering: index "Goods market efficiency", index "Labor market efficiency", Chinn-Ito index, budget deficit as a percentage of GDP, GDP growth rate, Harmonized Index of Consumer Prices, unemployment rate and interest rate on 10-year government bonds. Variables that measure structural reforms (index "Goods market efficiency", index "Labor market efficiency" and Chinn-Ito index) are at the beginning due to the highest relative exogeneity. Macroeconomic variables like GDP growth rate, Harmonized Index of Consumer Prices and unemployment rate and interest rate on 10-year government bonds are at the end of the order. Budget deficit is more exogenous than GDP rate and that is



why its place comes earlier in the order. Changes in GDP growth rate determine changes of inflation and unemployment rate data. The assumption is that long-term interest rates on government bonds react faster on changes in GDP growth rate than inflation and unemployment rate. Reasoning behind this is that movements in interest rates change quickly in financial markets, while data on inflation and unemployment rate lags changes in GDP growth rate.

#### IV. EMPIRICAL RESULTS

It is necessary for panel VAR to select a correct lag length. The main reason behind this is the number of lags determines degrees of freedom. If there were too many lags, that could lead to a loss of degrees of freedom and the model would have too many parameters. If there were not enough lags, then the model would not be able to capture the system's dynamics correctly. Based on Schwarz (SC) and Hannan-Quinn (HQ) information criteria optimal number of lags is one and that is the number of chosen lags in this model.

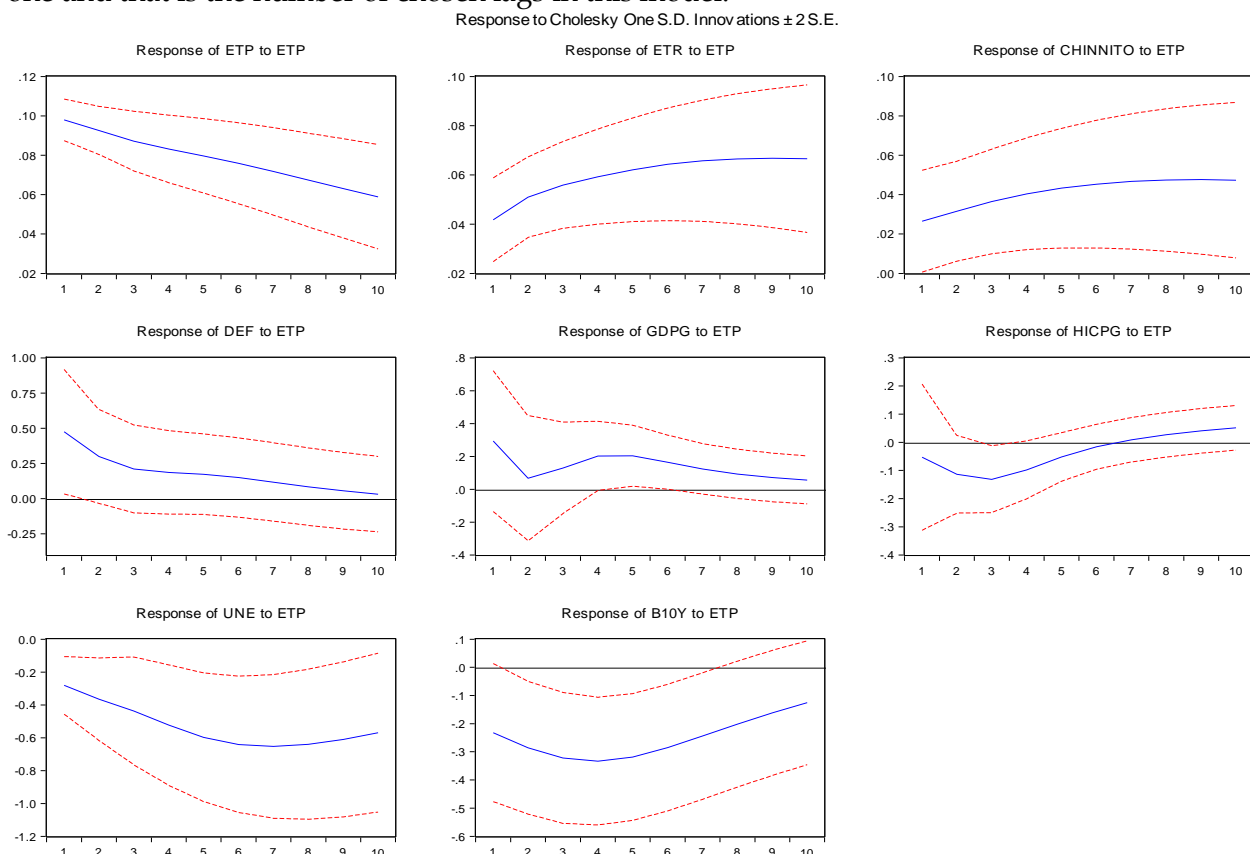


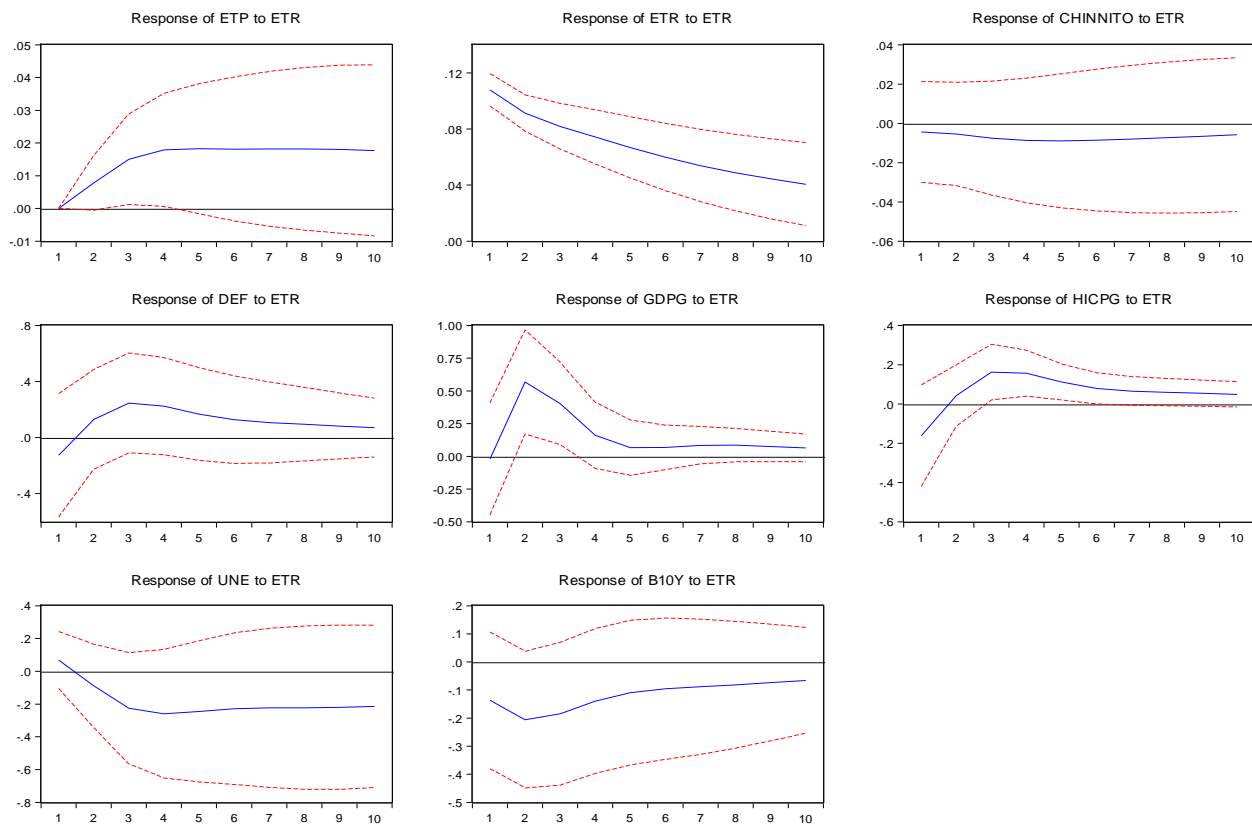
Figure 1: Responses of Goods Market Efficiency to one standard deviation shock for Eurozone countries. (a) impulse ETP - response ETP; (b) impulse ETP - response ETR; (c) impulse ETP - response CHINNITO; (d) impulse ETP - response DEF; (e) impulse ETP - response GDPG; (f) impulse ETP - response HICPG; (g) impulse ETP - response UNE; (h)



impulse ETP – response 10Y. Source: Authors’ calculations. Note: impulse responses with 95% confidence intervals. The y-axis measures deviations from the baseline, while the x-axis represents years after shock.

Effect of a labor market efficiency (ETR) shock increases GDP by about 0.3 per cent in the first year (Figure 1). The impact of this shock varies over 10 years, but it decreases after 5 years. A positive product market efficiency (ETP) shock reduces inflation (HICP) in the first 7 years. The same shock also reduces unemployment rate (UNE), which falls at a rapid pace in the first 6 years. The cumulative effect of improving product market efficiency is negative after 10 years. Results are consistent with theoretical predictions that indicate that enacting product market reform with emphasis on improving efficiency increases GDP growth rate (GDPG) and employment. This reform also reduces interest rates on 10-year government bonds (B10Y). Some Eurozone governments enacted structural reforms to reduce uncertainty in financial markets, which may explain this result. However, it is also important to look at a broader context. Monetary policy can also explain this reduction in interest rates. European central bank reduced key interest rate to historically low levels after the financial crisis.

Response to Cholesky One S.D. Innovations  $\pm$  2 S.E.

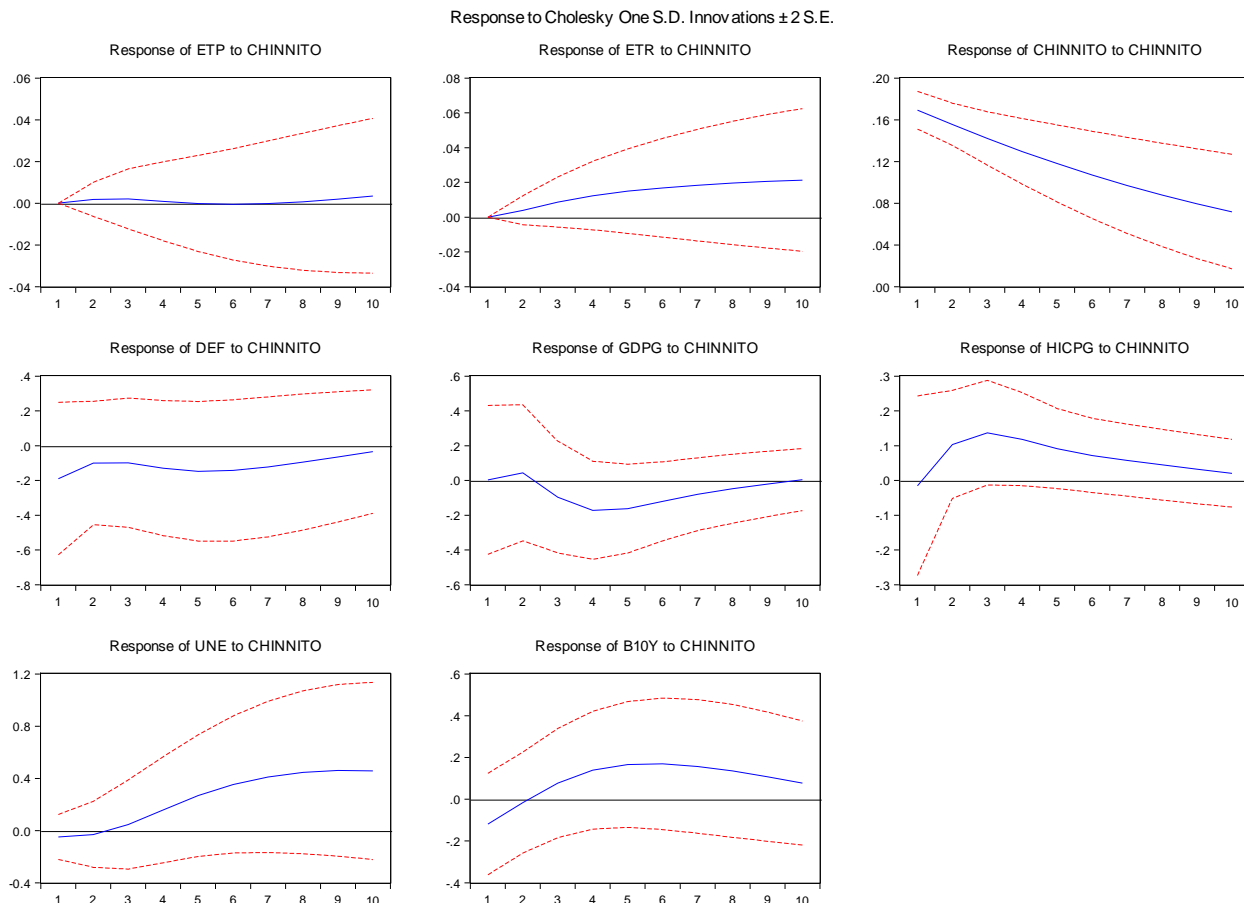


**Figure 2: Responses of Goods Market Efficiency to one standard deviation shock for Eurozone countries.** (a) impulse ETR – response ETP; (b) impulse ETR – response ETR; (c) impulse ETR – response CHINNITO; (d) impulse ETR – response DEF; (e) impulse ETR –



response GDPG; (f) impulse ETR – response HICPG; (g) impulse ETR – response UNE; (h) impulse ETR – response B10Y. Source: Authors' calculations. Note: impulse responses with 95% confidence intervals. The y-axis measures deviations from the baseline, while the x-axis represents years after shock.

Figure 2 shows how labor market efficiency shock affects GDP growth rate and other variables in the VAR system. Improving labor market efficiency leads to an increase in GDP growth rate in the first year after the shock. This effects slows after 4 years, but the cumulative effect is overwhelmingly positive. This shows that liberalizing labor markets improves GDP growth rate. Labor market shock also reduces unemployment rate in the first 3 years. This is consistent with theoretical predictions.

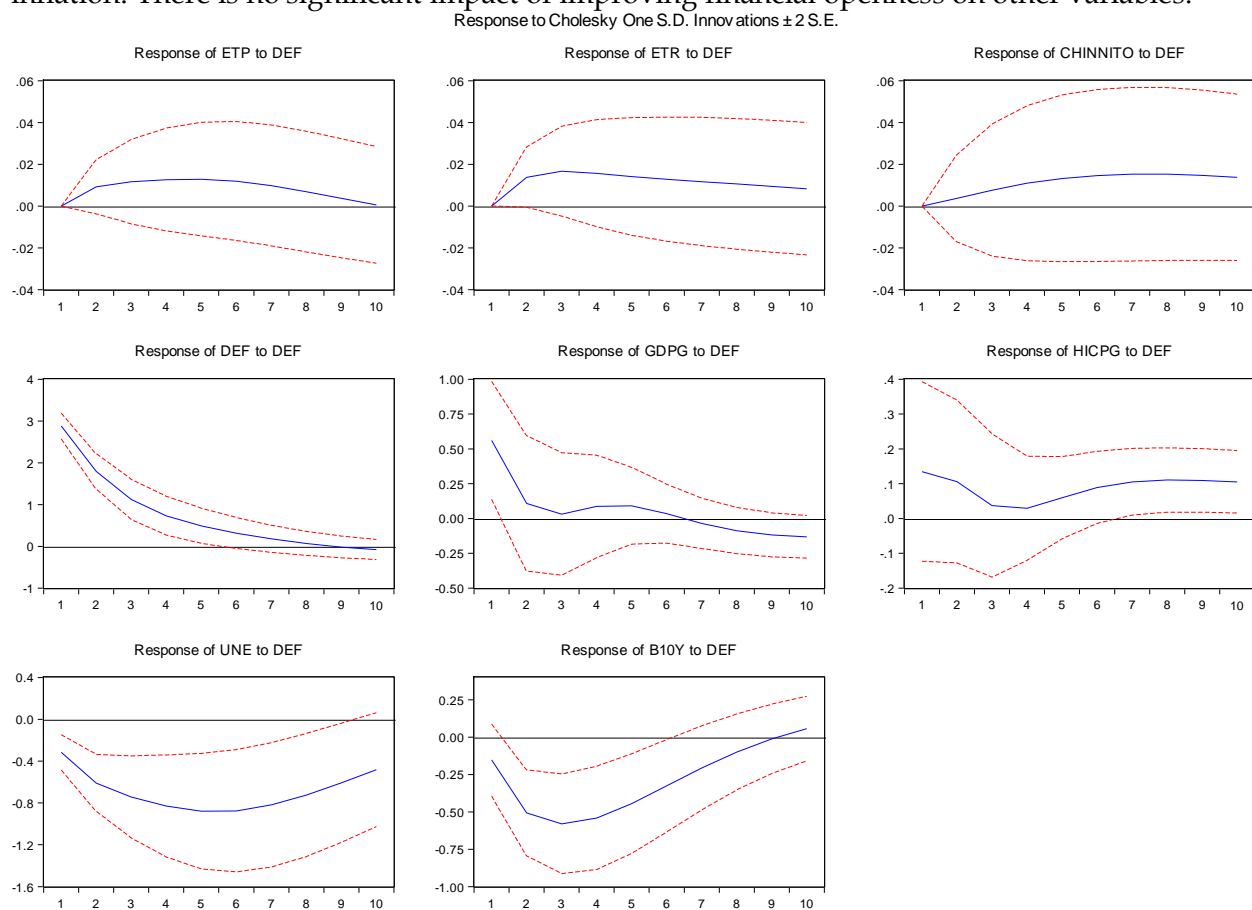


**Figure 3: Responses of financial openness to one standard deviation shock for Eurozone countries.** (a) impulse CHINNITO – response ETP; (b) impulse CHINNITO – response ETR; (c) impulse CHINNITO – response CHINNITO; (d) impulse CHINNITO – response DEF; (e) impulse CHINNITO – response GDPG; (f) impulse CHINNITO – response HICPG; (g) impulse CHINNITO – response UNE; (h) impulse CHINNITO – response B10Y. Source: Authors'



calculations. Note: impulse responses with 95% confidence intervals. The y-axis measures deviations from the baseline, while the x-axis represents years after shock.

Cumulative effect of a financial openness (CHINNITO) shock negatively affects GDP growth rate after 10 years. Although, this impact is positive in the first year, after 3 years, it becomes negative. Based on the results, improving financial openness also increases the unemployment rate. Results are consistent with theoretical predictions that improving financial openness during and after a financial crisis could negatively impact GDP growth rate and employment. The impact of a financial openness shock slightly increases interest rate on 10 year bonds and inflation. There is no significant impact of improving financial openness on other variables.



**Figure 4: Responses of budget deficit to one standard deviation shock for Eurozone countries.** (a) impulse DEF – response ETP; (b) impulse DEF – response ETR; (c) impulse DEF – response CHINNITO; (d) impulse DEF – response DEF; (e) impulse DEF – response GDPG; (f) impulse DEF – response HICPG; (g) impulse DEF – response UNE; (h) impulse DEF – response B10Y. Source: Authors’ calculations. Note: impulse responses with 95% confidence intervals. The y-axis measures deviations from the baseline, while the x-axis represents years after shock.





Figure 4 shows that effects of deficit (DEF) shocks are positive on GDP growth in the first year. The impact of this shock weakens and becomes negative after 7 years. That is consistent with theoretical predictions that increasing budget deficit increases aggregate demand and GDP growth rate. Economic theory also suggests that increasing deficit positively affects inflation and reduces unemployment rate. Results confirm such predictions. Cumulative effect of increasing deficit increases inflation and reduces unemployment rate after 10 years. In the first year after a deficit shock, inflation rate increases by 0.1 per cent and unemployment is lower by 0.4 per cent. Increasing deficits also reduces interest rates on 10-year government bonds. During this time, European Central Bank was reducing key interest rate, which also helped lower interest rates on government bonds. This may at least partially explain why interest rates moved lower. Impulse function response and variance decomposition results show that structural reforms had a positive effect on GDP. However, the impact of structural reforms is lower than the impact of increases in budget deficits. Therefore, it is possible to arrive at a judgement that increasing budget deficits after the financial crisis or periods of a sharp downturn is a better policy response to improve GDP than structural reforms. This also means that optimal economic policy may depend on a type of shock. If there is a large temporary negative demand shock because of business cycle movements, then an economic policy that focuses on stabilization may be appropriate. However, in case of a permanent shock, structural reforms may play a more important role. The financial crisis was a result of a negative demand shock. That may explain why panel VAR results show that the stabilization effect of deficit has a larger positive impact on GDP growth than structural reforms. Comparing the results of variance decompositions and impulse response functions show the importance of deficit in explaining movements of GDP in Eurozone countries. Results also show that there is a link between financial openness and GDP growth in a period after the financial crisis. A positive impact of improving financial openness on GDP growth rate is concentrated in the first 4 years. Later, this impact becomes negative. This implies that barriers on capital flows, even if they are temporary, could reduce GDP growth in years following the financial crisis. Positive effects of improvements in financial openness lead to an improvement in reducing unemployment after a certain period. Some Eurozone countries enacted labor market reforms immediately after the financial crisis when the Eurozone economy was in a liquidity trap, which may explain a negative impact of those reforms. The reason why unemployment increased could be due to reducing worker protections during crisis, negative impact of labor market deregulation in short term or easing restrictions for contract employment in Eurozone countries. Increases in budget deficit and improvements in product markets have a stronger positive effect on the GDP than improvements in labor markets and financial openness. One possible reason may be that product market reform and increasing budget deficit could have a greater impact in the short term, while the impact of labor market and financial openness reform could have an effect in the medium term. This research shows the importance of business cycle and improvements in structural reforms, especially of labor market reforms.



## V. CONCLUSION

This paper established how structural reforms and deficit impact economic growth. The research includes 19 Eurozone countries in a period between 2007 and 2017. Using impulse response functions and variance decomposition, the results show that a positive change in product markets, labor markets and financial openness had a positive impact on gross domestic product (GDP) in Eurozone countries. However, the paper finds that increasing budget deficits has a larger impact on GDP than increasing flexibility and competitiveness of product markets, labor markets and improving financial openness. The effect of improving financial openness is the largest in the first four years, but later, it becomes negative. The impact of improving competitiveness of product markets on GDP is larger than improving flexibility of labor markets. This paper also analyzes how changes in budget deficit, product markets, labor markets and financial openness effect unemployment rate. Results show that increasing budget deficit and competitiveness of product markets have a larger impact on reducing unemployment rate than improving flexibility of labor markets and financial openness. The paper also shows how the impact of changes in labor markets, product markets, financial openness and budget deficits on GDP depend on time. Improving financial openness and labor market flexibility have a larger impact in the medium term, while the impact of increasing deficit and improving product markets is larger in the short term. A limitation of this research is the fact that data is on an annual basis, primarily because data on indexes is only annually calculated. This paper uses data from a short period after the financial crisis in Eurozone countries. Since panel VAR models depend on choice of lags, it may be possible that a different choice of lags could lead to a different outcome. Instead of using different indexes, future research could focus on the effects of specific policies after major economic downturns. Identifying the impact of these policies could lead to a better understanding of structural reforms in Eurozone countries. This would also help with determining the impact of each reform. It might be helpful for further research to explore the impact of structural reforms in each Eurozone country. This way, it would be possible to compare the impact of reforms among countries. Additional recommendation for future research is to explore how different subindices impact macroeconomic variables, which may help improve results. Sharp economic downturns, caused by a financial crisis or not, are different among countries. Therefore, the effect of structural reforms and changes in deficits could be different. Future research could focus on analyzing the impact of structural reforms and changes in deficit during different sharp downturns.



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**APPENDIX A: Variance Decompositions for Eurozone countries**

Period	Variance Decomposition of ETP:								
	S.E.	ETP	ETR	CHINNIT					
				O	DEF	GDPG	HICPG	UNE	B10Y
1	0.097954	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.139186	93.76929	0.313769	0.016754	0.435475	1.279861	4.164993	0.010211	0.009643
3	0.172784	86.30595	0.960619	0.024910	0.736498	1.153147	10.75601	0.052110	0.010754
4	0.199463	82.14753	1.523660	0.020803	0.951220	0.870485	14.25831	0.174704	0.053285
5	0.220150	80.52802	1.937018	0.017156	1.121081	0.727922	15.15431	0.409789	0.104710
6	0.236570	80.02916	2.265031	0.015457	1.224962	0.650717	14.93330	0.751841	0.129532
7	0.249965	79.92000	2.557123	0.013923	1.250832	0.601412	14.35416	1.174168	0.128384
8	0.261079	79.92636	2.830252	0.013430	1.216105	0.569953	13.67931	1.646555	0.118032
9	0.270421	79.94151	3.084033	0.017676	1.152098	0.550849	12.99859	2.140430	0.114807
10	0.278386	79.90779	3.314484	0.032315	1.087531	0.538800	12.35956	2.629109	0.130410

Period	Variance Decomposition of ETR:								
	S.E.	ETP	ETR	CHINNIT					
				O	DEF	GDPG	HICPG	UNE	B10Y
1	0.115704	13.04990	86.95010	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.157685	17.48676	80.31133	0.061972	0.765329	0.609028	0.060523	0.066767	0.638290
3	0.188962	20.92275	74.67485	0.252169	1.306954	1.094310	0.242236	0.130711	1.376022
4	0.214460	23.88427	69.94457	0.525266	1.546034	1.184964	0.871371	0.190373	1.853149
5	0.235790	26.69283	65.88637	0.833069	1.637060	1.119123	1.478917	0.257169	2.095455
6	0.254052	29.39475	62.31000	1.154873	1.664973	1.031098	1.908147	0.335423	2.200733
7	0.270097	31.93068	59.10445	1.482388	1.660080	0.951906	2.212950	0.424555	2.232988
8	0.284474	34.25481	56.22116	1.809629	1.633977	0.882555	2.449328	0.523099	2.225443
9	0.297502	36.35661	53.63355	2.131448	1.593729	0.820750	2.637473	0.630157	2.196279
10	0.309378	38.24533	51.31754	2.444506	1.544730	0.765779	2.780271	0.745050	2.156794



Variance Decomposition of CHINNITO:

Period	CHINNIT								
	S.E.	ETP	ETR	O	DEF	GDPG	HICPG	UNE	B10Y
1	0.171244	2.391245	0.067325	97.54143	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.233922	3.102954	0.090406	96.43656	0.024413	0.098542	0.230553	0.005042	0.011528
3	0.276827	3.951454	0.138799	95.18704	0.092118	0.177054	0.397667	0.009358	0.046504
4	0.309218	4.873170	0.191601	93.84135	0.197688	0.209746	0.577259	0.011439	0.097751
5	0.334910	5.823354	0.234589	92.39997	0.323666	0.224585	0.822210	0.011329	0.160295
6	0.355861	6.779283	0.265511	90.90292	0.454532	0.238181	1.118250	0.010094	0.231225
7	0.373206	7.728250	0.286908	89.41384	0.579827	0.255159	1.419823	0.010138	0.306057
8	0.387682	8.658815	0.301284	87.98903	0.692189	0.275088	1.690129	0.014709	0.378756
9	0.399826	9.558966	0.310240	86.66529	0.786269	0.296506	1.912064	0.026976	0.443689
10	0.410053	10.41757	0.314912	85.46204	0.858982	0.318357	2.081793	0.049293	0.497058

Variance Decomposition of DEF:

Period	CHINNIT								
	S.E.	ETP	ETR	O	DEF	GDPG	HICPG	UNE	B10Y
1	2.928506	2.625709	0.187120	0.421210	96.76596	0.000000	0.000000	0.000000	0.000000
2	3.542566	2.506516	0.262930	0.368804	91.69836	0.597795	4.363478	0.004776	0.197336
3	3.855666	2.415849	0.628698	0.376580	85.82560	0.507484	9.595638	0.005728	0.644428
4	4.003979	2.455483	0.896058	0.454517	82.89995	0.624005	11.45608	0.055639	1.158268
5	4.068124	2.558187	1.036382	0.573230	81.75262	0.784306	11.57900	0.200214	1.516060
6	4.098206	2.653021	1.117777	0.686841	81.14952	0.867536	11.42703	0.426643	1.671635
7	4.114803	2.713019	1.176809	0.769708	80.67905	0.906175	11.35826	0.692509	1.704468
8	4.126582	2.739630	1.222836	0.818014	80.24354	0.928822	11.39258	0.957788	1.696789
9	4.137727	2.742789	1.256268	0.838251	79.81407	0.943087	11.51692	1.193882	1.694733
10	4.149744	2.732457	1.277935	0.840530	79.38864	0.949680	11.71013	1.384052	1.716573