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Monetary freedom and economic growth in New European Union Member States

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ABSTRACT

This paper analyses the relationship between monetary freedom (index measured by the Heritage Foundation) and real economic growth of 11 new member states of the European Union. 19-year panel data regression with fixed effects over the period of 1997–2015 reveals that the real GDP growth of the selected countries is positively affected by the degree of monetary freedom. However, the relationship between monetary freedom and real GDP growth has weakened after the global recession of 2008. Monetary freedom was not jeopardized during the crisis, while real GDP growth declined significantly in most of economies studied.

Monetarna Sloboda I Gospodarski Rast U Novim Članicama Europske Unije

SAŽETAK

U radu se analizira odnos između monetarne slobode i gospodarskog rasta u 11 zemalja novih članica Europske unije. Uporabom devetnaestogodišnjih panel podataka (od 1997 do 2015) regresiona analiza sa fiksnim efektima upućuje na zaključak da je na rast realnog GDP izabranih zemalja pozitivno uticao stupanj monetarne slobode. Međutim, veza između monetarne slobode i rasta realnog GDP slabi nakon globalne recesije iz 2008. Monetarne slobode nisu bile ugrožene tokom krize, dok je realni GDP u većini izabranih zemalja značajno opao.

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1. Introduction

Historically, monetary conditions have not always played an important role in theoretical considerations as a necessary precondition for a stable and efficiently functioning national economy. Early growth models were non-monetary and did not monitor monetary variables as factors which influence the real economy (Domar, 1946; Harrod, 1939; Solow, 1956; Swan, 1956). With the introduction of monetary conditions, changes in price levels were initially considered a potentially useful instrument to stimulate economic growth (Kaldor, 1954), although this has been referred to as a “slow and steady rate of inflation”

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(Kaldor, 1959, pp. 289, 290). Even Schumpeter held the view that rising prices may be good for economic growth (Sampaio, 1960). There have been some empirical studies that challenge the dominant theoretical paradigm and imply that the relationship is not quite as straightforward (Wai, 1959).

During the 1960s, it was difficult, to some extent, to reach unanimous conclusions. In the first half of the decade, the most influential theoretical models continued to support the notion that there was a positive relationship between inflation and economic performance (Mundell, 1963; Tobin, 1965). Later research identified a negative relationship (Sidrauski, 1967), implying that the relationship should be explored in the broader context of structural and institutional rigidities (Patrick, 1966) and that other factors should be involved (Seers, 1962).

The difficult experiences of developed countries which recorded average annual inflation rates of 13% in the period between 1974 and 1983 (Andrés & Hernando, 1999) paired with even more disappointing economic performance, contributed to the new wave of research which led to a move away from the belief of a positive relationship between inflation and growth, to a negative one. Instability of prices has been identified as a factor which slows investment and saving (Feldstein & Summers, 1979; Fry, 1980; Kormendi & Meguire, 1985; Stockman, 1981), as well as creating uncertainty (Able, 1980). The results of a vast number of studies performed during the 1990s and early 2000s were unanimous – stressing a strong negative relationship (Barro, 1995, 1996; Andrés & Hernando, 1997; Boyd, Levine, & Smith, 2001; Bruno & Easterly, 1998; De Gregorio, 1992, 1993; Fisher, 1993).

Monetary stabilization and price liberalization were some of the main elements of the mainstream economic doctrine of the transition process. Given that the goal was the transition to market-led economies, there could not be much disagreement over the significance of these objectives. However, major controversies arose over the speed of reforms and the concerns were mostly about the impact on economic growth. The new market-oriented institutional environment aimed for enabling and enhancing an entrepreneurial activity by giving economic agents greater freedom in decision making and by establishing the proper set of incentives, as well as creating stable and predictable economic and institutional environment. As an attempt to capture these diverse aspects, The Heritage Foundation formulated the Index of Economic Freedom in 1995. In the Heritage Foundation index, economic freedom was measured based on ten quantitative and qualitative factors, grouped into four broad categories: Rule of Law (property rights, freedom from corruption); Limited Government (fiscal freedom, government spending), Regulatory Efficiency (business freedom, labor freedom, monetary freedom); and Open Markets (trade freedom, investment freedom, and financial freedom).

In this paper the emphasis was put on monetary freedom as a part of regulatory efficiency measure. Considering that price control could also lead to market distortions in addition to high inflation, the focus of the studies of the impact of the monetary environment on economic growth in the last two decades has moved from inflation towards monetary freedom as a broader concept. The monetary freedom index combines a measure of price stability (inflation) with an assessment of price controls. From the perspective of economic growth, monetary freedom has a greater relevance compared to inflation, because both reflect basic monetary prerequisites for an efficient resource allocation and productive engagement of economic agents.

The main objective of this paper is to examine the relationship between the monetary freedom index (as defined by the Heritage Foundation) and real GDP growth in economies of transition, which became the latest member states of the European Union (EU) – the so-called “New Member States” (NMS). There is currently a lack of research that focuses on the relationship between economic growth and monetary freedom in the NMS of the EU, so this paper aims to address this shortcoming. Additionally, the aim is to examine the impact of the global economic crisis on the relationship between monetary freedom and economic growth.

2. Literature review

In previous studies, the effects of monetary freedom on economic performance have been grouped with other aspects and overall economic freedom. Some of these studies have found quite compelling evidence and causality that economic growth is determined by monetary freedom (Cebula & Clark, 2012; Gurgul & Lach, 2011). Other studies in which monetary freedom is observed as an integral part of an overall freedom score suggest a positive relationship (De Haan & Sturm, 2000). A possible reason for this practice is the fact that the effects are stronger when aggregate measures are employed (Doucouliagos, 2005). Some of the studies monitored both components of the monetary freedom index separately, concluding that wage and price controls were less significant than inflation (Heckelman, 2000). Some found that monetary policy and price stability played no role (Carlsson & Lundström, 2002). Even in an instance when freedom and economic growth were focused on, inflation was the only monetary condition observed (Ayal & Karras, 1998; Bengoa & Sanchez-Robles, 2003). Furthermore, in previous studies, the dominant method of measurement used was the Fraser Index of Economic Freedom (EFW) or more precisely, access to sound money (see Gwartney, Lawson, & Hall, 2012). The EFW is inappropriate for this study because some of its components are irrelevant to the selected sample of countries, as according to it, freedom includes the ability to own foreign currency bank accounts. As the Heritage Foundation index of monetary freedom was employed, in which inflation is weighted as four-fifths of the overall result, it was also found appropriate to review existing literature that is concerned with the inflation-growth nexus.

In the past, any country which had been subject to inflationary pressure has struggled to harmonize it with significant economic success. Moreover, these countries experienced tremendous breakdowns, whether developed or developing countries. When previous experience is considered, the clearest evidence that inflation affects economic growth adversely originates from episodes of very high inflation (Barro, 2013). The basic mechanism through which inflation influences economic growth refers to its negative impact on efficiency and productivity (Sarel, 1995). This effect is mainly noticeable in investments, especially in the reduced efficiency of investments rather than their volume (Ahmed & Mortaza, 2005). In this sense, if the starting point is the plausible assumption that uncertainty harms the economic performance of business organizations and if Fisher's (1993) claim that the variability of inflation is a very good measure of uncertainty in the macroeconomic environment is accepted, the consequences in the domain of economic efficiency are inevitable. Conversely, the reduction in volume of investments is a logical consequence of reduced efficiency, which is especially visible in long term. Inflation could push potential investors to follow more conservative strategies and to exercise great caution when making investment decisions.

Distortions in the efficient decision-making process arise from the fact that relative prices do not function properly under inflationary pressures and act as a signal (Pollin & Zhu, 2006). Bruno and Easterly (1998) suggest that during inflationary periods, capital accumulation slows down and only partially recovers after the crisis passes.

Inflation exerts a negative impact on efficient transacting in that it drives a wedge between financial and real capital – it lowers financial depth and reduces liquidity in the economy (Gylfason & Herbertsson, 2001). In such circumstances, the real sector will find it very difficult to find resources in order to finance growth and development. One of the reasons why there is a discrepancy between the financial and the real sector is that inflation amplifies additional information asymmetrically on the credit market as well as on the capital market. The consequences of this include the contraction of credit volume, distortion in the incentives of financial institutions to lend money, the increase in a firm's incentive to borrow money and the emergence of borrowers with “suspicious quality” on the credit market. The final outcome is less credit, a less efficient allocation of credit and a reduction in capital investments (Boyd et al., 2001). In inflationary conditions, foreign direct investments will probably experience a greater fall than domestic investments. If inflation is permanently or/and significantly present in an economy, it will, at first glance, reflect a lack of commitment and discipline in monetary policy (Bengoa & Sanchez-Robles, 2003), which undermines foreign investor confidence with regards to investing in that particular country. Similarly, Rode and Coll (2011) suggest that monetary conditions are closely related to different variables related to foreign trade. Moreover, inflation decreases the international competitiveness of a country, making exports more expensive. The influence on the tax system could also be negative because it can distort borrowing and lending decisions and then invoke long term risks related to public finances (Gokal & Hanif, 2004). Inflation could be also treated as a tax. Like every other tax, it produces distortive effects on economic activity (De Haan & Sturm, 2000). In addition, Fisher (1993) states that in an economy in which inflation is a regular occurrence the government has lost control over the system. Such a state cannot guarantee a better rule of law and adequate supporting institutions (Barro, 2013), making efforts towards property creation less likely (Müller-Armack, 1966).

If the direct impact of inflation on productivity is closely examined, it could be concluded that if inflation is high, it results in frequent changes in prices by firms (which could be very costly) and reduces the efficient amount of cash holdings by consumers. It will distort the efficient allocation of resources, because in these circumstances economic agents have to spend more time and resources in collecting information. The probability that they will make systematic forecasting errors, which additionally complicate the problem of efficient resource allocation, is high (Andrés & Hernando, 1999). In an inflationary environment, resources are devoted to cash management instead of the production of goods (De Gregorio, 1993). It could even cause further divergence in income distribution thus increasing inequality in an economy (Scully, 2002).

Some studies suggest that the impact of inflation on economic growth is not unconditionally discouraging. In this sense, the impact of inflation depends on its level and is characterized by non-linearity (Ahmed & Mortaza, 2005; Mubarik, 2005; Pollin & Zhu, 2006; Sarel, 1995; Sweidan, 2004). Even the degree of development could play a role, meaning that in developing countries it could actually stimulate the growth (Folz, 1970). However, the issue for less developed countries is the fact that it is difficult to merely “flirt” with inflation, as “*it will end up marring you*” (Burdekin, Denzau, Keil, Sitthiyot, & Willett, 2004, p. 530).

If inflation is reduced quickly, it should not cause permanent damage to economic growth (Bruno & Easterly, 1995). However, a distinction between the long-term and short-term effects of inflation has to be made in order to properly estimate the influences of inflation. Some suggest that growth is greater if inflation is lower (Andrés & Hernando, 1999; De Gregorio, 1993), or if an economy suffers from significant inflation, it would heavily shrink its economic performance (Barro, 2013).

Monetary freedom is not only determined by low inflation, it also requires the absence of price control (Cebula, 2013). Price liberalization is important for economic growth in two aspects. Sustainable price stability is possible only under free prices. If this condition is not met and a lot of prices in economy are controlled, a practice that was especially common in former socialist economies, then there is so-called suppressed inflation. Similarly, if some prices are under direct control of the state, economic subjects will not have the correct market information, because the system of relative prices in this case simply does not function. As a result, allocative efficiency will be impacted. A dysfunctional price system and deviations in relative prices will not incentivize economic agents to accommodate their preferences within real economic possibilities. In these cases, the “analytical engine” of the price system will be suspended and relationships between individual prices will not reflect the relative scarcity of resources (Julitz, 1971). In the context of economic freedom, it could be said that price control threatens the freedom of buyers and sellers to engage in mutually acceptable agreements and in effect, price controls take property from the owner (De Haan & Sturm, 2000).

3. The Empirical Model

This study focuses on the relationship between economic growth and the monetary freedom in 11 NMS during the period between 1997 and 2015. Economic growth is measured by the percentage change in real GDP (constant 2005 prices). Monetary freedom is measured using the Heritage Foundation’s Monetary Freedom Index (MFI).

The main hypothesis in this paper is that economic growth depends directly upon monetary freedom:

$$\text{GROWTH}_{i,t} = f(\text{MF}_{i,t-1}, Z_{i,t-1}) \quad (1)$$

Where $\text{GROWTH}_{i,t}$ is the percentage change in the real GDP in NMS country i in year t , $\text{MF}_{i,t-1}$ is the value of monetary freedom index in country i in the previous year and Z represents the vector of control variables. The MFI, as well as all control variables, are calculated based on a one-year time lag.

The Heritage Foundation has developed ten measures of economic freedom. Monetary freedom (MF), is determined by stability of prices (i.e. inflation rates) and its free market-determined level. A high degree of MF is characterized by low inflation and the absence of price controls. Such conditions mean citizens can rely on market prices for the foreseeable future, as well as make savings, investments and other long-term plans conducive to economic growth (Heritage Foundation, 2015).

Other economic freedom indices include: Fiscal Freedom (FF); Government Size Freedom (GSF); Business Freedom (BF); Trade Freedom (TF); Investment Freedom (IF); Financial Freedom (FINF); Property Rights Freedom (PRF); Freedom from Corruption (C); and Labor Freedom (LF). All these indices will be treated in the model as control variables.

All ten economic freedom indices are weighed so as to prevent bias toward any given freedom in any given piece of research. Each of the economic freedoms is graded using a scale ranging from 0 to 100, with 100 being the maximum freedom. Therefore, it is hypothesized that real economic growth is expected to be an increasing function of monetary freedom, *ceteris paribus*.

4. Empirical analysis

Given the model (Eq.1), the following general panel data model can be estimated:

$$\text{GROWTH}_{i,t} = \alpha_0 + \alpha_1 M_{i,t-1} + \sum_{k=2}^9 \alpha_k Z_{i,t-1} + u_{i,t} \quad (2)$$

Where $\text{GROWTH}_{i,t}$ is the percent change in the real GDP in country i in year t ;

$MF_{i,t-1}$ is the value of the monetary freedom index in nation i in year $t-1$;

$Z_{i,t-1}$ is the 1x8 control regressor matrix (FF ; GSF ; BF ; TF ; IF ; $FINF$; PRF ; CF);

$u_{i,t}$ is the error term.

The observed time period is $t = 1997 - 2015$ and observed economies are $i = 1, \dots, 11$.

Labor freedom (LF) is omitted from the model due to missing data. The explanatory variables are lagged by one year to avoid simultaneity issues. Data was available across the full study period for all 11 NMS, representing a totally balanced panel model with 209 (11 x 19) observations. The data source for the dependent variable (growth) was the World Economic Outlook Database (IMF, 2015), while the source for the independent variable and control variables was the Heritage Foundation (2015). Descriptive statistics for all variables are provided in Table 1.

The Levin–Lin–Chu test (Levin, Lin, & Chu, 2002) was applied to determine whether the data contains a unit root. The test indicated that all of the model's variables are stationary, i.e. do not have unit root (test results are shown in Appendix).

Equation (2) was estimated using both the fixed effects model and the random effects model. The fixed effects model is used, which is based on the Hausman Specification Test (Hausman, 1978). The test result is shown in Appendix.

In order to examine the effects of the economic crisis on the influence of monetary freedom on real GDP growth, panel regression was estimated both throughout the observed period of 1997 to 2015 (Model 1) and in the pre-crisis period between 1997 and 2008 (Model 2).

The Heritage Foundation affirms that the economic freedoms indices may be correlated. In order to find a source of serial correlation, the correlation matrix among the ten explanatory variables is shown in Table 2. All correlation coefficients, except four, are below 0.5 in absolute value. The exceptions are the correlations between the Property Right Freedom and its absolute value with three other indices: Business Freedom, Investment Freedom and Financial Freedom. In order to avoid the multicollinearity problem, the model in Equation (2) is estimated with the PRF variable omitted.

The results of the panel regressions after model adjustment to avoid multicollinearity are provided in Table 3.

As shown in Table 3, Monetary Freedom appears to influence the economic growth in the selected countries positively and significantly, in both models over the pre-crisis period (1997–2008) and the duration of the observed period (1997–2015). All eight economic

Table 1. Descriptive statistics.

Variable	Mean	Std. Dev.
Growth	3.15	4.23
MF	71.16	16.89
PRF	53.66	15.30
CF	44.98	10.48
FF	72.02	11.80
GSF	46.59	15.33
BF	70.66	9.800
TF	78.49	9.967
IF	67.39	12.47
FINF	64.78	14.21

Source: Own calculations.

Table 2. Correlation matrix for explanatory variables.

	PRF	CORF	FF	GSF	BF	MF	TF	IF	FINF
PRF	1.0000								
CORF	0.6421	1.0000							
FF	-0.0973	-0.0836	1.0000						
GSF	-0.2652	-0.2335	0.4660	1.0000					
BF	0.5157	0.4579	0.1989	0.0469	1.0000				
MF	0.1940	0.2944	0.3437	-0.1010	0.3429	1.0000			
TF	0.1428	0.2149	0.4610	0.1920	0.3406	0.4729	1.0000		
IF	0.6132	0.4455	0.2802	0.1254	0.4967	0.1802	0.4375	1.0000	
FINF	0.5125	0.2524	0.3036	-0.0293	0.3961	0.4572	0.2611	0.4477	1.0000

Source: Own calculations.

Table 3. Panel regression results.

Variables	Model 1 (1997–2015)		Model 2 (1997–2008)	
	Coefficient	Prob.	Coefficient	Prob.
Const.	0.622		-0.652	
MF	0.046**	0.011	0.056***	0.000
CF	0.014**	0.022	0.038***	0.000
FF	0.018	0.143	0.008*	0.065
GSF	0.009	0.237	0.005*	0.089
BF	0.003*	0.055	0.007**	0.025
TF	0.017*	0.096	0.024*	0.059
IF	0.004*	0.096	0.015**	0.029
FINF	0.003	0.489	0.006*	0.075
R squared	0.39		0.68	
F stat.	5.86	0.0000	8.22***	0.0000

***Statistically significant at the 1% level.

**Statistically significant at the 5% level.

*Statistically significant at the 10% level.

Source: Own calculations.

freedom variables exhibit the expected positive signs in both models. However, only five of them have statistically significant coefficients in the model throughout the observed period (MF, CF, BF, TF, IF), whereas for the 1997–2008 period, all of the variables have statistically significant coefficients. Thus, the inclusion of the crisis years within the model deteriorates the link between economic freedom and growth.

Furthermore, the R^2 values are quite different in the two models. While relatively high (0.68) in Model 2 (1997–2008), R^2 is 0.39 in Model 1 (1997–2015), providing additional evidence (apart from the statistical significance of coefficients) that the economic crisis of 2008 blurred the relationships between economic freedom and growth.

5. Conclusion

This paper explores the relationship between monetary freedom and economic growth performance in the 11 newest member states of the European Union. The originality and scientific contribution of the paper stems from the fact that only a limited number of previous studies have examined this relationship in relation to NMS. Previous studies of the relationship between monetary and growth performance of NMS focused primarily on the impact of inflation on growth. However, inflation is only one component of monetary freedom. Additionally, this paper tests the relationship between monetary freedom and real GDP growth throughout the period of 1997 to 2015, thus covering both the pre-crisis and crisis period, allowing the impact of the economic crisis on the relationship between monetary freedom and economic growth to be evaluated.

The main hypothesis of the paper, that monetary freedom is positively correlated with real GDP growth rates, is confirmed using the panel data regression method. Based on the empirical findings in the study, there is reasonably strong empirical evidence that monetary freedom significantly influenced the real economic growth rate in NMS over the period of 1997–2015. These results appear to be compatible with a variety of prior studies that explored the relationship between monetary freedom and economic growth by means of using various country samples.

The second hypothesis of the paper was that the global economic crisis of 2008 influenced the relationship between monetary freedom and economic growth. The empirical results obtained in this paper suggest that the relationship between monetary freedom and economic growth significantly deteriorated after 2008. In the main, monetary freedom was not compromised in NMS during the crisis, while real GDP growth declined significantly in the majority of NMS. The crisis has somewhat blurred not only the link between economic growth and monetary freedom, but the link between economic growth and all other Heritage Foundation indices of economic freedom included in the model as control variables (fiscal freedom, government size freedom, business freedom, trade freedom, investment freedom, financial freedom and freedom from corruption). Obviously, maintaining the level of economic freedom and its elements in NMS was not enough to fight the economic recession. This implies that the relative interest is now moved more toward the structural parameters in growth equation. Further research on the relationship between monetary freedom and economic growth could be directed towards the identification of factors that influence the relationship between these two variables. Further studies could also examine if membership of European Monetary Union (EMU) affects monetary freedom.

Disclosure statement

No potential conflict of interest was reported by the authors.

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References

- Able, L. S. (1980). Inflation, uncertainty, investment spending, and fiscal policy. *Economic Review*, 65 (February), 3–13.
- Ahmed, S., & Mortaza, G. (2005). *Inflation and economic growth in Bangladesh: 1981–2005*. Policy Analysis Unit, Research Department, Bangladesh Bank, Working Paper Series: WP, 0604. Retrieved from <http://www.esocialsciences.org/Download/repecDownload.aspx?fname=Document11410201091.124209E-02.pdf>
- Andrés, J., & Hernando, I. (1997). *Does inflation harm economic growth? Evidence for the OECD*. NBER Working Paper Series: No. w6062. Retrieved from <http://www.nber.org/papers/w6062.pdf>
- Andrés, J., & Hernando, I. (1999). Does inflation harm economic growth? Evidence from the OECD. In M. Feldstein (Ed.), *The costs and benefits of price stability* (pp. 315–348). Chicago, IL: University of Chicago Press.
- Ayal, B. E., & Karras, G. (1998). Components of economic freedom and growth: An empirical study. *The Journal of Developing Areas*, 32, 327–338.
- Barro, J. R. (2013). Inflation and economic growth. *Annals of Economics and Finance*, 14, 85–109.
- Barro, R. J. (1995). *Inflation and economic growth*. NBER Working Paper Series: No. w5326. Retrieved from <http://www.nber.org/papers/w5326.pdf>
- Barro, R. J. (1996). *Determinants of economic growth: A cross-country empirical study*. NBER Working Paper Series: No. w5698. Retrieved from <http://www.nber.org/papers/w5698.pdf>
- Bengoa, M., & Sanchez-Robles, B. (2003). Foreign direct investment, economic freedom and growth: New evidence from Latin America. *European Journal of Political Economy*, 19, 529–545.
- Boyd, H. J., Levine, R., & Smith, B. D. (2001). The impact of inflation on financial sector performance. *Journal of Monetary Economics*, 47, 221–248.
- Bruno, M., & Easterly, W. (1995). *Inflation crises and long-run growth*. NBER Working Paper Series: No. w5326. Retrieved from <http://www.nber.org/papers/w5209.pdf>
- Bruno, M., & Easterly, W. (1998). Inflation crisis and long run growth. *Journal of Monetary Economics*, 41, 3–26.
- Burdekin, C. K. J., Denzau, A. T., Keil, M. W., Sitthiyot, T., & Willett, T. D. (2004). When does inflation hurt economic growth? Different nonlinearities for different countries. *Journal of Macroeconomics*, 26, 519–532.
- Carlsson, F., & Lundström, S. (2002). Economic freedom and growth: Decomposing the effects. *Public Choice*, 112, 335–344.
- Cebula, J. R., & Clark, J. R. (2012). Lessons from the experience of OECD nations on macroeconomic growth and economic freedom, 2004–2008. *International Review of Economics*, 59, 231–243.
- Cebula, J. R. (2013). Which economic freedoms influence per capita real income? *Applied Economic Letters*, 20, 368–372.
- De Gregorio, J. (1992). The effects of inflation on economic growth: Lessons from Latin America. *European Economic Review*, 36, 417–425.
- De Gregorio, J. (1993). Inflation, taxation and long-run growth. *Journal of Monetary Economics*, 31, 271–298.
- De Haan, J., & Sturm, J. E. (2000). On the relationship between economic freedom and economic growth. *European Journal of Political Economy*, 16, 215–241.
- Domar, E. (1946). Capital expansion, rate of growth, and employment. *Econometrica*, 14, 137–147.
- Doucouliaqos, C. (2005). Publication bias in the economic freedom and economic growth literature. *Journal of Economic Surveys*, 19, 367–387.
- Feldstein, M., & Summers, L. (1979). Inflation and the taxation of capital income in the corporate sector. *National Tax Journal*, 33, 445–70.

- Fisher, S. (1993). The role of macroeconomic factors in growth. *Journal of Monetary Economics*, 32, 485–512.
- Folz, J. W. (1970). *Monetary theory and monetary policy: The work of Walter Eucken*. Berlin: Duncker & Humblot.
- Fry, J. M. (1980). Saving, investment, growth and the cost of financial repression. *World Development*, 8, 317–327.
- Gokal, V., & Hanif, S. (2004). *Relationship between inflation and economic growth*. Reserve Bank of Fiji, Working Paper: 2004/04. Retrieved from http://www.rbf.gov.fj/docs/2004_04_wp.pdf
- Gurgul, H., & Lach, L. (2011). *The nexus between economic freedom and growth: Evidence from CEE countries in transition*. MPRA Working Paper: No. 37434. Retrieved from https://mpra.ub.uni-muenchen.de/37434/1/Gurgul_Lach_manuscript_final.pdf
- Gwartney, J., Lawson, R., & Hall, J. (2012). *Economic freedom of the world: 2012 annual report*. Vancouver: Fraser Institute.
- Gylfason, T., & Herbertsson, T. T. (2001). Does inflation matters for growth? *Japan and World Economy*, 13, 405–428.
- Harrod, F. R. (1939). An essay in dynamic theory. *The Economic Journal*, 49, 14–33.
- Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica*, 46, 1251–1271.
- Heckelman, J. C. (2000). Economic freedom and economic growth: A short-run causal investigation. *Journal of Applied Economics*, 3, 71–91.
- Heritage Foundation. (2015). Index of Economic Freedom. Retrieved 2015, from <http://www.heritage.org/index/exploriere?view=by-region-country-year>.
- IMF. (2015). World economic outlook database. Retrieved 2015, from <https://www.imf.org/external/pubs/ft/weo/2015/01/weodata/index.aspx>.
- Julitz, L. (1971, November 9). Diagnosis: Accelerated inflation – Extent and consequences of inflation. *Frankfurter Allgemeine Zeitung*. p. 15.
- Kaldor, N. (1954). The relation of economic growth and cyclical fluctuations. *The Economic Journal*, 64, 53–71.
- Kaldor, N. (1959). Economic growth and the problem of inflation. *Economica: New Series*, 26, 287–298.
- Kormendi, C. R., & Meguire, P. G. (1985). Macroeconomic determinants of growth. *Journal of Monetary Economics*, 16, 141–163.
- Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*, 108(1), 1–24.
- Mubarik, A. Y. (2005). Inflation and growth: An estimate of the threshold level of inflation in Pakistan. *SBP-Research Bulletin*, 1, 35–44.
- Müller-Armack, A. (1966). *Economic order and economic policy – Studies and ideas of social market economy and European integration*. Freiburg im Breisgau: Verlag Rombach & Co GmbH.
- Mundell, R. (1963). Inflation and real interest. *Journal of Political Economy*, 71, 280–283.
- Patrick, T. H. (1966). Financial development and economic growth in underdeveloped countries. *Economic Development and Cultural Change*, 14, 174–189.
- Pollin, R., & Zhu, A. (2006). Inflation and economic growth: A cross country nonlinear analysis. *Journal of Post Keynesian Economics*, 28, 593–614.
- Rode, M., & Coll, S. (2011). Economic freedom and growth. Which policies matter the most? *Constitutional Political Economy*, 23, 95–133.
- Sampaio, A. (1960). Inflation and economic growth. *Giornale degli Economisti e Annali di Economia, Nuova Serie*, 19, 158–222.
- Sarel, M. (1995). Nonlinear effects of inflation on economic growth. *Staff Papers, International Monetary Fund*, 43, 199–215.
- Scully, W. G. (2002). Economic freedom, government policy and the trade off between equality and economic growth. *Public Choice*, 113, 77–96.
- Seers, D. (1962). A theory of inflation and growth in under-developed economies based on the experience of Latin America. *Oxford Economic Papers*, 14, 173–195.
- Sidrauski, M. (1967). Inflation and economic growth. *Journal of Political Economy*, 75, 796–810.
- Solow, M. R. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, 70, 65–94.

- Stockman, C. A. (1981). Anticipated inflation and the capital stock in a cash-in-advance economy. *Journal of Monetary Economics*, 8, 387–393.
- Swan, W. T. (1956). Economic growth and capital accumulation. *Economic Record*, 32, 334–361.
- Sweidan, O. D. (2004). Does inflation harm economic growth in Jordan? An econometric analysis for the period 1970–2000. *International Journal of Applied Econometrics and Quantitative Studies*, 1, 41–66.
- Tobin, J. (1965). Money and economic growth. *Econometrica*, 33, 671–684.
- Wai, U. T. (1959). The relationship between inflation and economic development: A statistical inductive study. *Staff Papers (International Monetary Fund)*, 7, 302–317.

Appendix

Results of Levin–Lin–Chu unit root tests:

Ho: Panels contain unit roots

Ha: Panels are stationary

Variable	Statistics (adjusted t)	p-value
Monetary freedom	–13.9013	0.0000
Property rights	–2.5209	0.0026
Freedom from corruption	–3.5719	0.0002
Fiscal freedom	–2.9191	0.0018
Government spending	–4.4463	0.0000
Business freedom	–2.1503	0.0250
Trade freedom	–4.9618	0.0000
Investment freedom	–1.9328	0.0457
Financial freedom	–1.5792	0.0571
Growth	–5.2101	0.0000

Number of panels = 11; Number of periods = 19; Time trend: Not included; Panel means: Included; ADF regressions: 1 lag; AR parameter: Common.

Source: Own calculations.

Result of Hausman specification test

Ho: difference in coefficients not systematic

$$\chi^2(9) = (b - B)'[(V_b - V_B)^{-1}](b - B) = 17.67$$

$$\text{Prob} > \chi^2 = 0.1592$$