The evolution of offshore-wealth among Visegrad Group residents, 2001-2015

Kate Devane, Senior Sophister
Michaela Fricova, Senior Sophister

The 34th Edition of the Student Economic Review begins with an erudite investigation into the evolution of offshore wealth in Hungary, Poland, the Czech Republic and Slovakia – collectively referred to as the Visegrad Group – by Kate Devane and Michaela Fricova. This stellar research makes fantastic use of econometric tools to examine the factors that determine variability in offshore wealth in the Visegrad countries in the period 2001-2015. The paper finds a significant increase in the mean amount of offshore wealth from 2001-2015, even after adjusting for GDP growth. Unemployment rate, public indebtedness, personal income taxation, the rule of law and natural resources are shown to be significant determinants in the evolution of offshore wealth, whilst higher offshore holdings are discovered among Visegrad Group residents during periods of good governance. In contrast, political stability and the GDP growth variables are demonstrated to have very little explanatory power. Finally, a structural break in the magnitude of offshore wealth holdings for the Czech Republic and Hungary is identified in the years following the 2008-2009 economic downturn. This paper is well-researched and driven by quantitative data, which is adeptly interpreted and analysed. Moreover, the work is brimming with clarity, a difficult task in itself given the complexity of the econometric analysis performed.

Above all, the work is original, epitomising the propensity for novel and innovative research amongst Trinity's undergraduates. For these reasons, we have decided to recognise this paper as the Best Overall Essay of the Student Economic Review XXXIV.

I. Introduction

"The billions attracted by tax havens do harm to sending and receiving nations alike' (Shaxson, 2019)"

The use of offshore tax havens deprives domestic economies of tax revenue, draining developing countries in particular of a valuable source of public funds (Henry, 2012). In aggregate, governments lose between $500 billion and $600 billion annually to tax havens in the form of lost corporate tax revenue (Crivelli, de Mooij & Keen, 2016; Cobham & Janský, 2018). Hungary comes in third place among EU nations in terms of these losses: it could collect an additional 23% of tax revenue was it not for the extensive use of offshore havens. Poland and the Czech Republic could collect a further 10% and 6% respectively (Torslov, Wier & Zucman, 2017). The potential impact of offshore wealth on inequality measures is particularly salient in the context of Eastern Europe. Four decades of communist rule in Czechoslovakia, Poland and Hungary had a pronounced effect on the distribution of wealth and income. From 1990-2000, the Gini coefficient estimates rose by an average of 10 basis points across the Visegrad Group [V4]. There is evidence that wealth inequality in the V4 has continued to rise up until and following the crisis: in Poland, for example, the concentration of assets amongst the wealthiest households increased by 4% in the period 2014-2018 (Krukowska, 2017). A similar upward trend in inequality has been observed in the Czech Republic.

Private wealth has come to comprise an increasingly important share of national wealth in Eastern Europe since the 1990s (Zuk et al., 2018). Residents of the V4 countries have in recent years been consistently linked to offshore entities (ICIJ Offshore Leaks Database, 2019), including former Slovakian prime minister Robert Fico (Liptáková, 2016). Pawl Piskorski, the Mayor of Warsaw (1999-2002), came under scrutiny in 2005 when it emerged that his assets exceeded those he declared as an MEP (2004-2009). In 2013 Piskorski attempted to open a Panamanian bank account on his own behalf (ICIJ Offshore Leaks Database, 2019). Having observed the increasing wealth inequality together with the scandals surrounding Panama Papers in recent years, we hypothesize a significant rise in offshore wealth among the residents of V4 countries.

Much of the research on the evolution of offshore wealth has been concerned with well-developed countries in Europe – primarily Scandinavia (Alstadsæter, Johannesen & Zucman, 2018) and France (Garbinti, Goupille-Lebret & Piketty, 2016). Studies have also been conducted to investigate the relationship between wealth inequality and offshore wealth. However, no study has provided a comprehensive time series analysis of offshore wealth in the V4. The Visegrad countries offer an interesting case study. They comprise four open economies that are similar in many ways - geographically, culturally, and historically (International Visegrad Fund, 2019) - but exhibit heterogeneity in terms of political stability and economic growth[1] . We, therefore, present the first study on the evolution of offshore wealth in the post-communist countries of the Visegrad group.

1 "Individual Visegrad countries are dealing with heterogeneous problems" (Helšusová, 2003); see also Figures 2 and 3.

Country-by-country estimates of offshore wealth by Alstadsæter, Johannesen and Zucman (2018) identify a number of significant factors that determine the national size of offshore wealth: a) proximity to Switzerland; b) political and economic instability; c) presence of natural resources (particularly oil); and d) taxation legislation. According to Andersen et al. (2016), exogenous income shocks can lead to significant increases in hidden wealth at the country level; these effects can, however, be mitigated when the country exhibits strong political stability[2].

This leads us to hypothesize:

H1: There was a significant increase in the overall magnitude of offshore wealth as a proportion of GDP in the V4 countries over the time period 2001 to 2015.

H2: The evolution of the political stability and economic stability indicators in each of the V4 countries is significant in explaining the size of offshore wealth as a proportion of GDP.

Countries with a history of severe and persistent financial crises such as Argentina and Russia are found to have higher percentages of offshore personal wealth relative to their GDP than nations with more stable macroeconomic structures. We thus anticipate significant spikes in offshore wealth to GDP ratios in these countries following the financial crisis.

2 We cannot test for the effect of proximity to Switzerland explicitly as we use a fixed effects model. However, our four countries' respective proximities to Switzerland (and indeed other tax havens) are similar. Hence, we assume that this variable is unlikely to be significant in driving heterogeneities in offshore wealth in this particular study.

We therefore also hypothesize that:

H3: Hungary and the Czech Republic, the 2 countries of the V4 that were most severely affected by the Financial Crisis of 2008-09 would note a structural break in the magnitude of offshore wealth in the years following the crisis.

II. Literature Review

Henry (2012) calculates a revised measure of the distribution of global financial wealth, taking offshore wealth into account, and finds that nearly half of all offshore wealth is owned by 0.001% of the world's population. He finds that the offshore economy is large enough to have very significant negative impacts on the domestic tax bases of "key source countries"[3] , of which Hungary is one. From the 1970s until 2010, private elites in these countries had accumulated $7.3 to $9.3 trillion of unrecorded offshore wealth. Henry's work highlights the implications of private offshore wealth for these countries, both in terms of their international balance sheets and inequality measures.

Shaxon, Christiensen and Mathiason (2012) scale-up BIS offshore deposit data by non-banks by a ratio of deposits to all financial assets. They estimate the total value of offshore private wealth to be $11.5 trillion as of June 2004, approximately $9.5 trillion of which consisted of offshore financial assets.

Novokmet, Piketty and Zucman (2017) present results on the evolution of private and offshore wealth in Russia. They find that Russian-owned offshore wealth is more than three times larger than official foreign reserves. They also find that Poland, the Czech Republic and Hungary have each been characterized by high and rising inequality

3 Those countries that have seen consistent net capital outflows over time.

since 1990. Moreover, inequality varies among post-communist countries, with the top 1% income shares below 5% in Russia but below 3% in the Czech Republic. They attribute this disparity to differing institutional frameworks that emerged after the fall of the Soviet Union, with Eastern European countries boasting a higher rule of law and better protection of property rights[4] than Russia. Institutional and political factors may thus be significant in determining the magnitude of offshore wealth in Eastern European countries.

Genschel, Lierse and Seelkopf (2016) find that at any country size and tax level, poorly governed countries suffer more in terms of capital outflows. Well governed countries boast low corruption and have a reasonably effective tax administration. Poorly governed countries can offer fewer guarantees to investors against the future expropriation of their assets. Thus, they show the regressive distributive effect of tax evasion under poor governance.

The literature on the association between cross-country differences in personal income taxation and offshore wealth magnitude is somewhat contradictory: some studies indicate lower levels of offshore wealth in high-income tax countries (Alstadsæter et al., 2019); others suggest the contrary (Novokmet et al., 2018). However, a reasonably unified perspective on the time-varying characteristics of personal income taxation within a country has been outlined in the research. A one-off increase in private income tax is generally associated with a rise in wealth held offshore by residents (Torslov et al., 2019). This is directly testable with our panel data specification.

4 The higher-quality institutional frameworks are likely a consequence of prospective accession to the EU (Berglof & Roland, 1997).

III. Empirical Approach

We drew on some of the empirical methods used by Zucman (2013) and Alstadsæter, Johannesen and Zucman (2018). The steps of our analysis were:

(a) Investigate the evolution of deposits since the early 1990s, treating it as a proxy[5] for the evolution of offshore wealth. We calculate the total amount of household wealth held in each offshore centre for the time period 2001-15 [using the estimates compiled by Zucman (2017)] and then assign a proportion of this to the four countries. These proportions are based on the percentage of deposits in each respective OFC belonging to residents of each V4 country. From this, we approximate the magnitude of private offshore wealth for each V4 country from 2001 through 2015.

(b) Perform paired-samples t-test to test hypothesis 1, that overall magnitude of offshore wealth has risen in the four counties over the period 2001 to 2015. We account for an increase in Gross Domestic Product during the time period by scaling the results by GDP for each country in question.

(c) Regress our offshore wealth measure on various potential determinants of offshore wealth holdings (as outlined in the literature), including measures of economic and political stability. We ensure our explanatory variables fall within a generally acceptable range of multicollinearity (as specified in Hair et al., 1995; and Ringle et al., 2015).

Our preferred specification is outlined in Equation (1) where refers to the magnitude of offshore household wealth, as proxied by offshore deposits, in a given year and time quarter. The variable refers to an indicator

5 See section VI: 'Caveats'.

of political stability. Also accounted for is a rule of law indicator . Changes in unemployment rate, GDP growth, and public debt, constitute our indicators of economic stability. Change in taxation legislation is proxied by the per-

$$wealth_{it} = 0 + \beta_1 gdp_{it} + \beta_2 debt_{it} + \beta_3 unempl_{it} + \beta_4 politit_{it} + \beta_5 resit_{it} + \beta_6 law_{it} + \beta_7 incit_{it} + \epsilon_{it} \quad (1)$$

IV. Overview of the Data Set

Our dataset is compiled from a number of sources. For the offshore deposit data, we rely on freely available data published by the Bank for International Settlements (BIS, 2019). In particular, our analysis utilizes the international bank deposits data, published quarterly by the BIS office, over 2001-2015 for each of the four Visegrad Group countries. Our analysis uses data on the deposits owned by non-banks only. That is, we always exclude interbank deposits, as they do not reflect households' offshore wealth . As in Alstadsæter et al. (2018), we assume that if (for example) Poles own 10% of the deposits belonging to foreign non-banks in Singapore, then they also own 10% of the household offshore wealth held there—i.e., that the distribution of deposits is the same as that of offshore wealth[7].

Table 1 shows the summary statistics of offshore deposits in each of the Visegrad group countries togeth-

6 Natural resource rents are time variant due to natural endowments, the propensity of governments to commercialize resources, global prices etc.

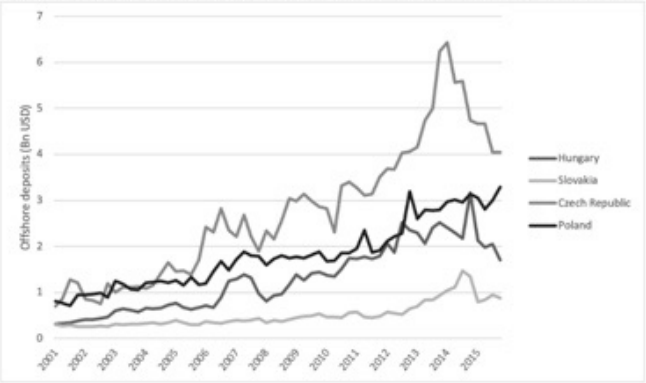
7 The dataset does include a specific measure of household deposits. This household deposit measure does not however allow for wealthy households using financial holding companies as the nominal holders of their assets, in which case their deposits are assigned to the broader category of "non-bank financial" owners (Alstadsæter et al, 2018). Hence, we base our analysis on the general "non-bank financial" deposits measure.

er with providing statistics on average offshore deposits in years 2001, 2005, 2011 and 2015; Figure 1 traces the evolution of offshore deposits over the time period.

Table 1. Summary Statistics of Offshore Deposit Evolution in V4.

	2001 Mean	2005 Mean	2011 Mean	2015 Mean	Total Mean	Total Median	Total SD
Hungary	0.34	0.69	1.75	1.96	1.30	1.28	0.72
Slovakia	0.28	0.33	0.49	0.86	0.51	0.40	0.27
Czech Republic	0.91	1.49	3.23	4.53	2.69	2.49	1.49
Poland	0.81	1.23	2.02	3.04	1.81	1.74	0.72

Figure 1:
Evolution of Offshore Deposits for the Visegrad Group



Note:

(1) The magnitude of offshore deposits is in billions USD. Data is collected quarterly.

(2) We note a clear upward trend during 2000-2015 in all of the four countries; most notably in the Czech Republic and Hungary. However, a temporary drop in offshore wealth in these two countries a few years after the onset of the financial crisis is clearly shown. This is consistent with Czech Republic and Hungary being the two regions most severely impacted by the economic downturn (Pakulski, 2016). In contrast, Slovakia and Poland exhibit much lower deviations from the long-run trend.

As for the potential determinants of offshore wealth holdings, we utilize a number of indicators published by the World Bank (2019); its "Political Stability and Absence of Violence/Terrorism", "Rule of Law" and "Total Natural Resources Rents as a % of GDP" estimates. Changes in unemployment rate, per capita income, GDP growth and public debt from the World Bank's (2019) World Development Indicators constitute our indicators of economic stability. The plots of political stability and GDP growth for each of the four countries over the time period are depicted in Figures 2 and 3. We also include the coefficient of personal income taxation based on statistics from the OECD Tax Database (2019).

Figure 2: Estimates of Political Stability and Absence of Violence/Terrorism

Note: Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, [i.e. ranging from approximately -2.5 to 2.5.]

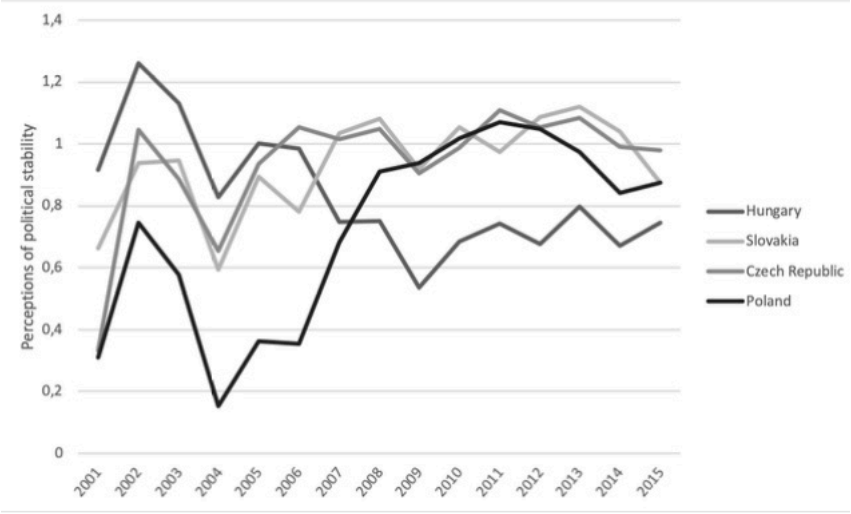
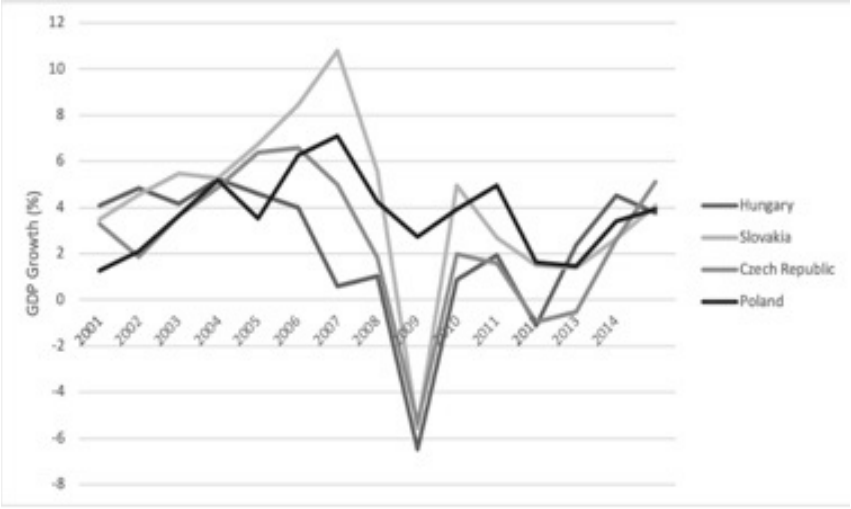


Figure 3: GDP Per Capita Growth

Note: Annual figures on Per Capita GDP Growth in the Visegrad Four. GDP per capita growth in $Bn.



V.Results

We find a significant increase in the mean amount of offshore wealth in the Visegrad countries over 2001-2015. Results of the paired samples t-test for equality of offshore wealth means are summarized in Table 2. We find the increase in the mean amount of offshore wealth holdings between the years 2001 and 2015 to be significant even at the 1% significance level. Furthermore, there is an approximately $1.95 billion increase in the mean amount of non-bank offshore wealth held by the Visegrad Four during the period (see Table A1 in Appendix).

Table 2. Paired samples t-test,

	t-stat	df	Significance (right-tailed)
Difference in offshore wealth between 2001 and 2015	-6.85***	3	0.003

Note: GDP-scaled paired samples t-test with the lower-tailed alternative hypothesis (assumes that the mean difference is less than zero). Statistical significance is as follows ***p < 0.01, **p < 0.05, *p < 0.1.

As for the influence of the 2008 Financial Crisis, we identify a dramatic rise in the magnitude of offshore wealth holdings for the Czech Republic and Hungary in the years following the downturn. More specifically, we find structural breaks in the offshore wealth series of both countries. The main results of structural break testing are reported in Table 3.

For the Czech Republic, we discover a sudden dramatic deviation from the long-run upward time trend in the series between the years 2010 and 2015. This rise is significant even at the 99% confidence level. Per Zeileis et al. (2013), we conclude that a structural break in offshore wealth holdings can be traced back to the first quarter (Q1) of 2013. As for Hungarian offshore wealth holdings, we again conclude a presence of structural break with 99% confidence. The recursive Optimal 2-segment partition F-testing traces the sudden dramatic deviation from the long-run wealth trend to Q4 of 2011.

These results are in accordance with Popov (2015). Since Hungary and the Czech Republic were the two V4 countries most severely impacted by the 2008-09 Global Financial Crisis, their series might exhibit signs of capital flight to more financially secure locations in the aftermath of the crisis.

Table 3. F-Tests for the presence of structural break

	Czech Republic	Hungary
1. Ave-F	87.642*** < 2.2e-16	98.953*** < 2.2e-16
2. Optimal breakpoint	Q1 2013	Q1 2012

Note: (1) We tested the model null hypothesis that non-bank offshore wealth is only a function of a linear trend regressor in Hungary/in the Czech Republic, against the alternative of a breakpoint occurring in offshore wealth series between Q1 2010 and Q4 2015. We employed the Ave F test as specified in Andrews (1993), to test whether the linear trend regression model only fits a subset of our time series country data. We rejected the null hypothesis of offshore wealth rising linearly in the series, against the alternative of a breakpoint being present in the data. Statistical significance is as follows ***p < 0.01, **p < 0.05, *p < 0.1. (2) The optimal breakpoint for each of the two countries was identified using Optimal 2-segment partition F-testing.

The results of our panel data regression estimation[8] are summarized in Table 4. Our preferred specification is outlined in column (1), as it explains most variation in offshore wealth. We find the unemployment rate, public indebtedness, personal income taxation, the rule of law and resources all to be significant determinants of offshore wealth. Contrary to Genschel et al. (2016), we find the Rule of Law index score to have a positive effect on offshore wealth holdings. Higher offshore holdings are discovered among Visegrad residents during periods of good governance. In contrast, political stability and the GDP growth variables have very little explanatory power[9].

8 Having observed country-specific fixed effects among the Visegrad group (refer to Appendix Figure 1 and Appendix Figure 3) and non-zero variance of the random effect (see Table A2), we estimate the preferred panel data specification using fixed effects method. The full range of supplementary diagnostic checks can be found in the Appendix.

9 One possible explanation for this is that high political stability may be associated with strongly

Table 4. Determinants of per-country offshore wealth

	(1)	(2)	(3)	(4)
Political stability	-0.58	1.08		-0.12
	(0.44)	(0.90)		(0.22)
Unemployment rate	-0.14***		0.07**	-0.06**
	(0.01)		(0.01)	(0.02)
Public debt	0.09***		0.07***	0.07***
	(0.01)		(0.01)	(0.01)
Per capita GDP	-0.00		-0.00	-0.00
	(0.00)		(0.00)	(0.00)
Income Taxation	0.03**		0.02***	0.02***
	(0.01)		(0.01)	(0.01)
Rule of law	1.37*			
	(0.56)			
Resources	-0.72**			
	(0.14)			
Observations	240	240	240	240
R2	0.73	0.07	0.63	0.64

Note: Fixed effects regressions based on quarterly data for 2001-2015. Heteroscedasticity robust standard errors also adjusted for observed serial correlation are in parentheses. Statistical significance is as follows ***p < 0.001, **p < 0.01, *p < 0.05.

VI. Caveats

We acknowledge that there are some limitations to our analysis. Our study only examines financial wealth. We exclude foreign residential real estate, gold, art and other non-financial assets as there is no systematic information available on these assets. Moreover, deposits only account for a fraction of total offshore wealth. The BIS dataset we use does not include portfolio equities, mutual share funds and bonds entrusted by households to offshore banks. Following Alstadsæter et al. (2008), we are confident in our assumption that the distribution of offshore bank deposits is strongly cor-

autocratic government. (World Bank, 2014) We would expect political stability to be positively significant (domestic uncertainty is reduced, reducing incentive to hold money abroad) in explaining offshore wealth. However, it is possible that in aggregate the negative effects of stability on wealth (risk of expropriation by an autocratic government or elite in-group, extractive domestic tax regime) counteract the positive, leading to overall insignificance. [see section VI: 'Caveats' for further discussion]

related with that of total offshore wealth. As such, our orders of magnitude are likely robust.

The increasingly widespread use of shell companies since the mid-2000s complicates matters, making it challenging to identify the beneficial owners of wealth held offshore. We anticipate a disproportionate amount of wealth may be assigned to countries where shell corporations are located.

We cannot rule out the possibility that variables with explanatory power may have been omitted. In particular, (following our unexpected result regarding the effects of political stability) further study should include the effects of levels of corruption and democracy on offshore wealth.

VII. Conclusion

Mean offshore wealth belonging to Visegrad residents has increased significantly from 2001-2015. Our analysis indicates that unemployment rates, levels of public indebtedness, personal income taxation, the rule of law and natural resource rents are significant determinants of V4 offshore wealth. Somewhat surprisingly, we find that political stability and GDP growth have very little explanatory power. We find evidence of a structural break in the magnitude of offshore wealth holdings for the Czech Republic and Hungary in the years following the 2008-2009 downturn. We conclude that economic instability is an important factor driving V4 residents to hold wealth in offshore centres, as are institutional and legislative factors. We propose some possible extensions: for one, the dataset used could be expanded to include portfolio security data. Moreover, further research may benefit from a more comprehensive regression analysis, including measures of corruption and democracy. While further study is

needed to provide a comprehensive picture of offshore wealth in the V4 in recent decades, we see our research as a useful starting point for investigation of Central and Eastern European offshore wealth.

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