

Klaudia Jarno*
Hanna Kołodziejczyk**

Two Years of the Bank Tax in Poland – an Analysis of Effects

Abstract

The main purpose of the paper is an attempt to assess the effects of introducing a bank levy in Poland on selected indicators of the banking sector using the difference-in-differences method. The employment of the difference-in-differences method does not result in strict findings regarding the incidence of the newly introduced bank levy. Although we observe negative effects on ROA, the value of assets, and the value of loans, and positive effects on the number of employees, our results are not statistically significant.

Key words: bank tax, banking sector, difference-in-differences

1. Introduction

On 1 February 2016 a bill imposing a tax on assets of selected financial institutions entered into force in Poland.

The new tax receipts are central budgetary revenues. The tax is expected to fund social policy projects and to increase the extent to which financial sector contributes to the state's budget.

The tax is payable by domestic banks, branches of foreign banks, branches of credit institutions, cooperative savings-and-credit funds, domestic insurance companies, domestic reinsurance companies, branches of foreign insurance and reinsurance

* Klaudia Jarno works at Department of Monetary Policy and Financial Markets, Faculty of Economics, Poznań University of Economics and Business.

** Hanna Kołodziejczyk works at Department of Monetary Policy and Financial Markets, Faculty of Economics, Poznań University of Economics and Business.

companies, principal branches of foreign insurance and reinsurance companies, and consumer loan lending institutions.

The taxable base is the excess of total assets over 4 billion PLN for banks and other credit institutions, 2 billion PLN for insurers and 200 million PLN for consumer loan lending institutions. When it comes to banks, cooperative savings-and-credit funds as well as credit institutions, the taxable base is subject to reductions of many kinds (in particular the taxable amount may be reduced by the value of Polish Treasury bonds). The tax rate is 0.0366% monthly.

The literature on the effects of introducing a bank levy is limited. Following the approach broadly presented in literature (Buch et al.¹, Capelle-Blancard and Havrylchyk², and Celerier et al.³) we employ difference-in-differences method to assess the effects of imposition a bank tax in Poland. The main purpose of this paper is **an attempt to assess the effects of introducing a bank levy in Poland on selected indicators of the banking sector using the difference-in-differences method.**

2. Bank levies across Europe

Bank taxes have been introduced in many EU countries since 2010 (mainly in 2011). Financial institutions other than banks are subject to levies in many countries as well. Table 1 summarizes bank levies in place in EU countries.

Usually, the rationale behind levying a tax on banks is that bank crises cause expensive burden for a public finance system (mainly by rescuing systemically important banks) and it is a way of shifting this burden⁴. However, one should have in mind that Poland maintains that the tax is levied on banks to fund social policy programs. Generally, there are two main ways of using additional revenues streams generated by the bank tax. In most EU countries bank tax revenues contribute to the central budgets. Other common practice is that bank levy revenues contribute to a special financial stabilization fund which is expected to mitigate systemic risk.

There is a considerable variation in bank levies across Europe. Firstly, most countries refer to the liability side of banks' balance sheet when determining the

¹ C.M. Buch, B. Hilberg, L. Tonzer, *Taxing banks: An evaluation of the German bank levy*, "Journal of Banking and Finance", 2016, no. 72, pp. 52–66.

² G. Capelle-Blancard, O. Havrylchyk, *Incidence of Bank Levy and Bank Market Power*, "CEPII Working Paper", 2013, no. 2013-21. Available at: http://www.cepii.fr/PDF_PUB/wp/2013/wp2013-21.pdf [Accessed 26 February 2017].

³ C. Celerier, T. Kick, S. Ongena, *Changes in the Cost of Bank Equity and the Supply of Bank Credit*, 2017. Available at: <https://www.fdic.gov/bank/analytical/cfr/bank-research-conference/annual-17th/papers/16-celerier.pdf> [Accessed 1 May 2018].

⁴ M. Kogler, M. Kogler, *On the Incidence of Bank Levies: Theory and Evidence*, "University of St. Gallen Discussion Paper", 2016, no. 2016-06, p. 1. Available at: <http://ux-tauri.unisg.ch/RePEc/usg/econ-wp/EWP-1606.pdf> [Accessed 26 February 2017].

tax base (equity and insured deposits are exempted) but not all the countries follow this pattern. It is worth noting that French levy is imposed on minimum regulatory capital. On the other hand, Hungary, Slovenia, and Poland impose levies on assets. Secondly, tax rates differ significantly between countries, even if they determined the tax base similarly (see Table 1). What is more, some countries have opted for a flat tax rate (for instance Belgium and France) while some other have chosen a progressive tax rate dependent on the amount taxed (Austria, Germany, Hungary, the Netherlands, and the United Kingdom). The Netherlands and the United Kingdom differ between long-term and short-term funding additionally.

Table 1. Bank levies in EU countries

Country	Year of implementation	Tax base	Tax rate (as of 2012)	Allocation
Austria	2011	Total liabilities net of equity and insured deposits	0.0–0.085%*	Central budgetary revenue
Belgium	2012	Total liabilities net of equity and insured deposits	0.035%	Central budgetary revenue
Cyprus	2011	Total liabilities net of equity	0.09%	Financial stabilization fund revenue
France	2011	Minimal amount of own funds required to comply with coverage ratio	0.25%	Central budgetary revenue
Germany	2011	Total liabilities net of equity and insured deposits	0.0–0.06%*	Financial stabilization fund revenue
Hungary	2010	Total assets net of interbank loans	0.15–0.53%*	Central budgetary revenue
Latvia	2011	Total liabilities net of equity and insured deposits	0.036%	Financial stabilization fund revenue
The Netherlands	2012	Total liabilities net of equity and insured deposits	0.0–0.044%**	Central budgetary revenue
Poland	2016	Total assets	0.0366%	Central budgetary revenue

Country	Year of implementation	Tax base	Tax rate (as of 2012)	Allocation
Portugal	2011	Total liabilities net of equity and insured deposits	0.05%	Central budgetary revenue
Romania	2011	Total liabilities net of equity and insured deposits	0.1%	Financial stabilization fund revenue
Slovakia	2012	Total liabilities net of equity and insured deposits	0.4%	Central budgetary revenue Financial stabilization fund revenue
Slovenia	2011	Total assets	0.1%	Financial stabilization fund revenue
Sweden	2009	Total liabilities net of equity and insured deposits	0.036%	Financial stabilization fund revenue
The United Kingdom	2011	Total liabilities net of equity and insured deposits but netting of gross assets and liabilities against the same counterparty and deduction for liquid assets	0.0–0.088%**	Central budgetary revenue

* Depending on the amount taxed.

** Depending on the amount and whether funding is either long-term (half rate) or short-term.

Source: on the basis of: S.M. Chaudhry, A. Mullineux, N. Agarwal, *Balancing the regulation and taxation of banking*, "International Review of Financial Analysis", 2015, vol. 42, pp. 38–52; M. Devereux, N. Johannesen, J. Vella, *Can Taxes Tame the Banks? Evidence from the European Bank Levies*, "Saïd Business School Research Papers", 2015, no. 2015-05; L. Kovács, *Bank Taxes in the European Union*, "Public Finance Quarterly", 2012, vol. LVII, iss. 3, pp. 332–346.

3. Literature review

As a repercussion of the recent global financial crisis a number of varying taxes on financial institutions have been proposed or enacted, including a financial transaction tax, a bonus tax and levies on financial institutions⁵. A Financial Activities Tax has been proposed by the IMF in a report for the G-20⁶.

The literature on the effects of introducing a bank levy on banking sector's indicators focuses, among others, on passing the burden of newly introduced tax onto customers. Kogler found empirical evidence for the presence of this phenomenon in the EU-23⁷. Capelle-Blancard and Havrylchuk found that in the case of Hungary the tax was shifted to customers with the smallest credit demand elasticity, such as households with an outstanding mortgage⁸. It is possible by raising interest and fee margins. The authors employed the difference-in-differences method relying on the fact that the tax rate in Hungary is much higher for big banks than for small ones.

There is also growing literature concerning the influence of tax imposition on banks' balance sheets and performance. Two different strands of research should be distinguished depending whether a tax is imposed either on liabilities (net of equity) or assets.

Perotti and Suarez assessed the effect of a Pigouvian tax on non-deposit liabilities as a tool to internalize systemic risk external costs generated by short-term funding and found that when banks were heterogeneous and obtained different benefits from short-term funding this tool could be not only effective but also preferable to liquidity regulation⁹.

Devereux et al. studied the effect of bank levies introduced in European countries on the risk-taking behavior of banks¹⁰. In their findings they conclude that bank levies had an effect on banks' funding choices and can be successful in reducing banks' funding risk but also had an effect on banks' portfolio choices. In short, the levies induced banks to borrow less but also to hold more risky assets.

Celerier et al. showed that liability tax led banks to shrink their balance sheet as well as to shift the composition of their balance sheet to assets that are more capital

⁵ D.A. Shackelford, D.N. Shaviro, J. Slemrod, *Taxation and the Financial Sector*, "National Tax Journal", 2010, vol. 63, no. 4, part 1, pp. 781–806.

⁶ International Monetary Fund, *A Fair and Substantial Contribution by the Financial Sector. Interim Report for the G-20*, Washington, DC, 2010.

⁷ M. Kogler, *On the Incidence...*, *op. cit.*

⁸ G. Capelle-Blancard, O. Havrylchuk, *Incidence...*, *op. cit.*

⁹ E. Perotti, J. Suarez, *A Pigouvian Approach to Liquidity Regulations*, "International Journal of Central Banking", 2011, December 2011 issue. Available at: <http://www.ijcb.org/journal/ijcb11q4a1.htm> [Accessed 1 May 2018].

¹⁰ M. Devereux, N. Johannesen, J. Vella, *Can Taxes Tame the Banks? Evidence from the European Bank Levies*, "Saïd Business School Research Papers", 2015, no. 2015-05. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2563634 [Accessed 15 April 2017].

demanding, i.e. corporate loans¹¹. Therefore, by decreasing a relative cost of equity a liability tax has potential for increasing both bank equity ratios and bank lending.

On the contrary, Buch et al. found empirical evidence of a reduction in lending after the bank levy had been introduced in Germany¹². However, there is no proof of changes in the provision of new loans. The authors also found evidence that banks increased deposit rates as a response to the levy. It is also worth mentioning that the majority of German banks were exempt from paying the tax.

The second strand of research concerns a situation where a tax is imposed on assets.

Dia and Van Hoose showed that imposition of a tax on banking lending could correct the over-lending problem by reducing the returns from lending, although it could also adversely affect the composition of lending¹³.

4. Methods

Methods used in the paper include: descriptive analysis, comparative analysis, and econometric modeling.

On the basis of the literature review we identify the main reasons for introducing a bank levy in European countries and discuss the main differences in bank taxes' characteristics.

Research methodology with regard to the quantitative analysis presented in the paper follows the procedure known as difference-in-differences (DID). The DID is a statistical technique that studies the differential effect of a treatment on a 'treatment group' (in our case the treatment group comprises Poland's banking sector) versus a 'control group' (in our case – the Czech Republic's banking sector). We use Czech banks as a control group since there is no tax levy in the Czech Republic. Poland and the Czech Republic are neighbouring countries at the similar development level. What is more, a factor that strongly affected profitability of Polish banks in 2016 (a sale of shares of Visa Europe to Visa International) refers to Czech banks as well.

The DID was employed by many authors that had been investigating effects of bank tax imposition and so far has proved to be an effective research tool.

The aim of this study is an attempt to assess the effects of introducing a bank levy in Poland on selected indicators of the banking sector using the difference-in-differences method.

¹¹ C. Celerier, T. Kick, S. Ongena, *Changes...*, *op. cit.*

¹² C.M. Buch, B. Hilberg, L. Tonzer, *Taxing banks...*, *op. cit.*, pp. 52–66.

¹³ E. Dia, D. Van Hoose, *Bank taxes and loan monitoring: a cautionary tale*, "The Manchester School", 2016, vol. 86, no. 1, pp. 1–20.

Celerier et al. list some characteristics that are typically seen as important bank capital structure determinants, i.e. among others bank size, bank business model (composition of assets), and bank profitability¹⁴. The characteristics reported above are of particular interest to other researchers too (cf. Devereux et al., Celerier et al.).

We have decided to use respectively changes in total assets, changes in total value of loans, and return on assets as proxies for those characteristics.

The novelty of our study is an inclusion of changes in employment in a banking sector. Employment should be seen here as a cost of operations. Thus, in more adverse environment we expect banks to look for possible cost cuts and to decrease the employment.

We use a difference-in-differences approach with time and country fixed effects (e.g., Angrist and Pischke¹⁵) using regression to estimate equations such as:

$$Y_{it} = INTERCEPT + \beta_1 * TREATED + \beta_2 * TIME + \beta_3 * DID + \varepsilon$$

with the β_3 as an estimation of the relevant effect of a treatment (introducing a bank tax) on Poland's banking sector. This model also includes three dummy variables, controlling for the time (month) effect, the country effect and an interaction between them.

Four models are constructed and estimated with different dependent variables, which are:

EMPLOYMENT – a variable of simple percentage increases of the number of employees in the banking sector;

ASSETS – a variable of simple percentage increases of the total value of assets of the banking sector (in local currency);

LOANS – a variable of simple percentage increases of the total value of loans granted by the banking sector (in local currency);

ROA – a variable of the return on assets (in percentages) of the entire banking sector.

The analysis covers the period between January 2014 and December 2017 (with a monthly frequency, quarterly for data on employment). Data comes from websites of the Polish Financial Supervisory Authority, the Czech National Bank, and kurzy.cz.

¹⁴ C. Celerier, T. Kick, S. Ongena, *Changes...*, *op. cit.*, p. 13.

¹⁵ J.D. Angrist, J.-S. Pischke, *Mostly Harmless Econometrics: An Empiricist's Companion*, 2008, pp. 165–169. Available at: https://www.researchgate.net/profile/Joshua_Angrist/publication/51992844_Mostly_Harmless_Econometrics_An_Empiricist's_Companion/links/00b4953344a9a0cb13000000/Mostly-Harmless-Econometrics-An-Empiricists-Companion.pdf [Accessed 25 February 2017].

5. Findings

Following the approach broadly presented in the literature, we employ DID to test whether introducing a bank tax in Poland has affected the selected banking sector's indicators (i.e. an increase of total assets, loans, profitability and number of employees). With regard to our research procedure, we selected four dependent variables for the DID regression referred to as EMPLOYMENT, ASSETS, LOANS and ROA. After using the techniques mentioned above and testing the statistical significance of the coefficient standing by the DID dummy variable (which is the estimator of the DID) as well as other estimated parameters the conclusion is that none of the presented models can adequately explain the effects of introducing the bank tax in Poland (the results of the estimation are reported in Table 2).

Table 2. DID regression results

	(1)	(2)	(3)	(4)
dependent variable Y	EMPLOYMENT	ASSETS	LOANS	ROA
INTERCEPT	0.7892* (0.2986)	0.4839 (0.3213)	0.4358* (0.1673)	0.09618*** (0.00668)
TREATED	-1.0100* (0.4223)	0.1363 (0.4544)	0.1791 (0.2366)	-0.02218* (0.009447)
TIME	-0.5808 (0.4353)	0.3696 (0.4642)	-0.0134 (0.2417)	0.00007306 (0.009650)
DID	0.3171 (0.6156)	-0.6225 (0.6565)	-0.3075 (0.3418)	-0.006935 (0.01365)

Standard errors in parentheses.

*** p<0.001, ** p<0.01, * p<0.05

Source: authors' own work.

The regression results show that the sign of the estimated DID parameter affecting the EMPLOYMENT variable is positive. In contrast to that, the DID estimates in the models for ASSETS, LOANS and ROA are negative. Those findings, were they statistically significant, would suggest that the introduction of the bank tax impacted ROA, the value of assets and the volume of loans of the Polish banking sector negatively, while the number of employees rose as a consequence of levying the tax.

Although, DID has proved to be an effective tool in assessing the effects of a bank tax on different banking indicators in many studies, and the indicators selected seem to be typically seen as crucial indicators of banking sector, we are not able to

observe the effects of tax imposition. One explanation is that the time series used in our analysis are still too short. Another possibility is that the method cannot yield significant results due to the fact that there is not a sufficiently similar control group to base the calculations on. The choice of the Czech Republic was made based on our opinion that it was the best out of possible alternatives taking into account macroeconomic and banking sectors' characteristics. However, banking sectors in Poland and the Czech Republic may not be similar enough to form a proper comparison basis. Finally, the effects of a newly-introduced tax in Poland can be non-linear, hence a need to use more sophisticated econometric methods to assess them.

6. Conclusion

Although the findings regarding ROA, the volume of loans, and the value of assets are in line with our predictions, the results with respect to the number of employees contradict our predictions. Nevertheless, our results are not statistically significant so the employment of the DID method has not provided an adequate answer to question on the effects of introducing a bank levy in Poland on selected indicators of the banking sector.

To sum up, we have observed a great variation in bank tax characteristics across EU countries. Still, we haven't found any empirical evidence of the effect of the newly-introduced bank levy on employment, assets, loans, and ROA of the banking sector in Poland using DID as methodology.

Bibliography

Angrist J.D., Pischke J.-S., *Mostly Harmless Econometrics: An Empiricist's Companion*, 2008. Available at: https://www.researchgate.net/profile/Joshua_Angrist/publication/51992844_Mostly_Harmless_Econometrics_An_Empiricist's_Companion/links/00b4953344a-9a0cb1300000/Mostly-Harmless-Econometrics-An-Empiricists-Companion.pdf [Accessed 25 February 2017].

Buch C.M., Hilberg B., Tonzer L., *Taxing banks: An evaluation of the German bank levy*, "Journal of Banking and Finance", 2016, no. 72, pp. 52–66.

Capelle-Blancard G., Havrylchyk O., *Incidence of Bank Levy and Bank Market Power*, "CEPII Working Paper", 2013, no. 2013-21. Available at: http://www.cepii.fr/PDF_PUB/wp/2013/wp2013-21.pdf [Accessed 26 February 2017].

Celerier C., Kick T., Ongena S., *Changes in the Cost of Bank Equity and the Supply of Bank Credit*, 2017. Available at: <https://www.fdic.gov/bank/analytical/cfr/bank-research-conference/annual-17th/papers/16-celerier.pdf> [Accessed 1 May 2018].

Chaudhry S.M., Mullineux A., Agarwal N., *Balancing the regulation and taxation of banking*, "International Review of Financial Analysis", 2015, vol. 42, pp. 38-52. Available at: <http://>

www.birmingham.ac.uk/Documents/college-social-sciences/social-policy/CHASM/2015/Balancing-the-regulation-and-taxation-of-banking2015International-Review-of-Financial-Analysis.pdf [Accessed 15 April 2017].

Devereux M., Johannesen N., Vella J., *Can Taxes Tame the Banks? Evidence from the European Bank Levies*, "Saïd Business School Research Papers", 2015, no. 2015-05. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2563634 [Accessed 15 April 2017].

Dia E., Van Hoose D., *Bank taxes and loan monitoring: a cautionary tale*, "The Manchester School", 2016, vol. 86, no. 1, pp. 1–20. Available at: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/manc.12172> [Accessed 1 May 2018].

Kogler M., *On the Incidence of Bank Levies: Theory and Evidence*, "University of St. Gallen Discussion Paper", 2016, no. 2016-06. Available at: <http://ux-tauri.unisg.ch/RePEc/usg/econwp/EWP-1606.pdf> [Accessed 26 February 2017].

Kovács L., *Bank Taxes in the European Union*, "Public Finance Quarterly", 2012, vol. LVII, iss. 3, pp. 332–346. Available at: https://www.asz.hu/storage/files/files/public-finance-quarterly-articles/2012/a_332_346_kovacs.pdf [Accessed 15 April 2017].

International Monetary Fund, *A Fair and Substantial Contribution by the Financial Sector. Interim Report for the G-20*, Washington, DC, 2010.

Perotti E., Suarez J., *A Pigouvian Approach to Liquidity Regulations*, "International Journal of Central Banking", 2011, December 2011 issue. Available at: <http://www.ijcb.org/journal/ijcb11q4a1.htm> [Accessed 1 May 2018].

Shackelford D.A., Shaviro D.N., Slemrod J., *Taxation and the Financial Sector*, "National Tax Journal", 2010, vol. 63, no. 4, part 1, pp. 781–806.