

## Analysis of the Structure of Various Components for Gross Fixed Capital Formation. Comparative Study Case for Poland and Other Selected European Countries

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### Abstract:

Considering the literature which demonstrates the high importance of investment in creating a competitive advantage for the economy and economic growth, an analysis was made of the structure of some elements of gross fixed capital formation in the Polish economy and few selected European countries. This made it possible to identify the situation of the Polish economy over the years in terms of the structure of investment, and to attempt in answering to the question of whether the rate of accumulation of fixed capital in Poland is sufficient to close, or reduce the distance of development in relation to highly developed countries.

In Poland, the leader among the sectors which absorb the largest percentage of investments remains expenditures with construction assets, and the smallest expenditure with intellectual property products. Poland is one of the countries with high GDP growth over the years. However, along with GDP growth, a decreasing trend can be seen in the sphere of investment expenditures, which does not allow for the reduction of the development gap. The methods used include an analysis of the literature, data contained in statistical databases (GUS and Eurostat) and specialized reports (PARP). The period of analysis covers the years 2004-2020 due to the fact that Poland's accession to the European Union took place in 2004, which allows for accurate international comparisons.

**Keywords:** national accounts; gross fixed capital formation; investment outlays; production.

**JEL Classification:** E01; E22; E23; G31; O31; O33.

### Introduction

The search for the causes of economic growth seems to be a natural manifestation of human inquisitiveness and attempts to unravel the problem of increasing production dynamics and improving living conditions. As emphasized in many research (Landes, 1990; Kylymnuk et al., 2007) the concept of welfare is still an unfinished puzzle. The analysis of this issue repeatedly refers to the answer to the question posed by Adam Smith, *i.e.*, what constitutes the nature and source of the wealth of nations. Attempts to answer, within the framework of economic theory, have been extremely different. Over time, therefore, the question has taken a form that has made it possible to divide it into the following segments:

- Why some countries are rich and others poor?
- Whether and how it is possible to accelerate the growth rate of poorer countries so that there is a reduction in the development gap between countries and a similar level of per capita income is achieved?

The lack of a universal recipe for development disparities motivates economists to develop concepts that attempt to explain the phenomenon (Dokurno et al., 2017; Helpman, 2004; Dąbrowski, 2018).

Economists highlight that the accumulation of physical and human capital generates pro-development incentives. The ability of the economy, or individual entities, to generate an adequate rate of savings and the ability to trade them effectively in the form of investment, determines a high rate of income growth. Through these activities, the maximization of productive resources and their transformation becomes possible. By modernizing the fixed assets, the level of efficiency and, as a result, the potential of the economy is increased.

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However, the increase in productive capacity is determined by a permanent and sufficiently broad supply of financial resources. For this reason, the basis for maximizing the means of production is adequate savings. Countries characterized by a high level of development are rich because they create a large stock of capital and manage it efficiently.

The differences between the rate of return on investment in the various economies are due to the resources, technology achieved and preferences. Therefore, the resources that countries have managed to accumulate in different quantities are the result of the savings rates achieved in the previous production cycles.

Profit maximization is the primary objective of economic entities and, in order for this to be achieved, a series of investment decisions are necessary. In a market economy, investment is the engine of its development. There is no clear definition of the commonly used term 'investment', however, according to Hirshleifer (1965), investment is a current sacrifice for future benefit.

In the area of the material approach, investment should be considered in terms of the flow of goods, *i.e.*, the increase or replacement of the fixed and current assets of an enterprise. In the other words, this activity is aimed at creating wealth through the implementation of an investment process. The material nature of this activity involves investment in such assets that result in cost reductions, improvements in health and safety, increases in labour productivity and environmental protection. In this aspect, investment should be seen as a process of converting capital into certain assets, for the direct increase of the physical capital of the whole society (Mandziuk et al., 2016).

## 1. Literature Review

Within the material approach, a number of investment theses have arisen. Kamerschen et al. (1991) have pointed out that investment represents purchases of capital goods, in the form of dwellings, factories, equipment and stocks consumed in the production process. An analogous position is taken by Begg et al. (2003), who identify investment with purchases of capital goods. Kotler (1994) in his definition specifies assembly and production equipment. A broader approach is represented by Samuelson and Nordhaus (2010), who identify investment with the use of capital stock to construct buildings, resources and equipment, repeating Hirshleifer's view that current consumption must be sacrificed in order to increase future consumption. In their definition, Kowalczyk and Kusak (2006) emphasize the concept of financial outlay for the purchase of tangible, financial, intangible and legal assets.

All of these theses, despite the different formulation of the issue in question, combine the characteristics associated with purchases and financial outlays in an enterprise in order to modernize business entities and maximize future profit.

The implementation of inventions and their large-scale application requires a significant accumulation of capital. This is associated with the embodiment effect, according to which at least part of the innovation is embodied in capital. At the same time, according to the vintage effect, new fixed assets have a higher productivity than older generations, converted per unit of expenditure at constant prices (Wolf, 1991).

According to the acceleration model, companies determine their potential capital requirements on the basis of their recent production flow. As a result, the accumulation of new capital, *i.e.*, investment expenditure, is proportional to the difference between demand and existing capital. Growth in production at a constant rate does not lead to changes in the level of investment, so the stimulus needed to increase intended investment is accelerated production growth. In the acceleration model, firms generally do not have the ability to substitute one factor of production for another to achieve a particular flow of output in the most efficient way. However, the demand for more capacity must go through the planning, approval, contracting and installation stages before intentions become expenditure (Clark, 1917; Chenery & Hollis, 1952; Knox, 1952; Begg et al., 2003).

The neoclassical model shows that competing entities invest to maximize profits. Then, the demand for new capital varies according to production, the relative price of capital goods, taxes and interest rates. The neoclassical model is based on the economy's production function, which describes the maximum output that firms can achieve from any stock of capital goods in combination with other factors of production (Jorgenson, 1971). In maximizing profit, firms choose the amount of capital they need to invest to satisfy demand for their production at the lowest possible cost. It is worth emphasizing that enterprises cannot individually influence the prices at which they sell their products or the prices of capital goods. In general, enterprises provide the products that their customers demand at the existing prices when the economy is in equilibrium. Under these circumstances, the production function of the economy measures the quantity of capital that firms need to invest in order to meet the demand of their customers as profitably as possible, given prevailing prices. The rate of return that competing firms earn on their optimal stock of capital is equal to the cost of using it. In the neoclassical model, under common simplifying assumptions about the form of the production function, the optimal stock of capital is proportional to output divided by the cost of capital (Kopcke & Brauman, 2001).

The Modigliani-Miller (1958) model indicates that the value of the enterprise itself, as well as the investment activity, should not depend on the financing methods. In such a case, equity and debt capital are substitutable for each other and financial parameters should not influence the level of investment. However, market imperfections such as asymmetric information, transaction costs, taxes, the differing interests of shareholders, or the stage of development of the economy in which the entity operates affect investment decisions and production itself.

Tobin's  $q$  model indicates that the demand for capital changes with the ratio of the market value of firms' capital assets to the replacement value of those assets. The ratio compares the return on capital with the rates of return demanded by investors that finance the capital. Values of  $q$  above unity support investment spending, whereas values below unity reduce demand for new capital goods (Tobin, 1969; 1982). The price of investors' demand for capital is determined by the present value of the return they estimate to receive from their investment.

The dependence of capital expenditure (defined as gross fixed capital formation) on the financial situation of economic entities was the subject of theoretical considerations and empirical research as early as the 1980s. A significant percentage of papers (Fazzari et al., 1988; Gilchrist & Himmelberg, 1995; Kaplan & Zingales, 1997; Cleary 1999; Bond et al., 2003; D'Espallier et al., 2009; Allayannis & Mozumdar, 2004; Almeida et al., 2004; Hovakimian & Titman, 2006) refer to the dependence of investment on cash flow, called the *Investment- Cash Flow Sensitivity* relationship, using Tobin's  $q$  ratio or working in its opposition. Some studies, pioneered by Meyers (1977), include variables in the investment model that extend the interpretation of the results of the study, *i.e.*, interest costs or the level of debt (Hernando & Martínez-Carrascal, 2008; Martínez-Carrascal & Ferrando, 2008).

The relationship between *cash flow* and investment should be statistically significant when there is an observable difference between the cost of raising external capital and the cost of engaging own capital, so that a situation of perfect substitutability does not arise. This situation occurs in the presence of asymmetric information, transaction costs or when the capital market of an economy is underdeveloped. Companies reduce their level of investment because they do not have access to external financing (Nehrebecka & Jarosz, 2012).

The hypothesis of the relationship between investment and cash flow was confirmed by Fazzari et al. (1988) on the basis of information on industrial enterprises in the United States. It was suggested that businesses, for which it is impossible or too expensive to obtain external financing, depend the level of investment on the generated profit, which presented the view that the sensitivity of investments to changes in cash flow can show the financial health of businesses.

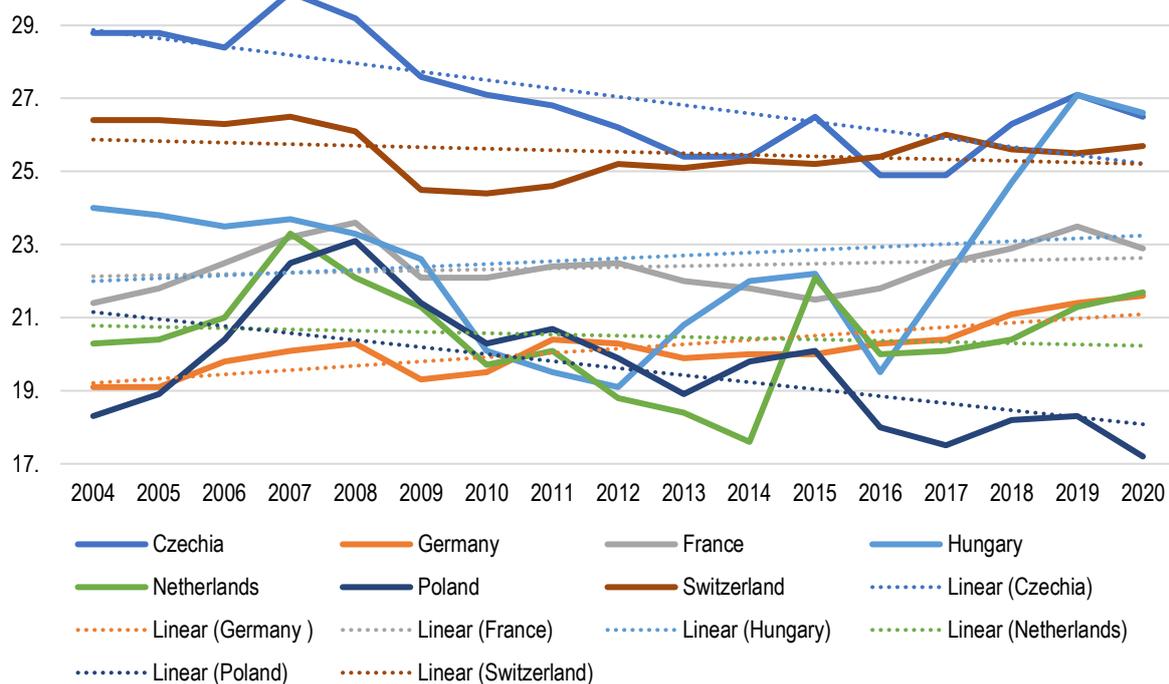
It seems indisputable that business investment is a key economic category from the perspective of economic development as well as highly sensitive to changes in the economic environment. A decrease in the level of investment has negative consequences for the future functioning of the entire sector of the economy due to the gradual reduction of production capacity. It is worth emphasizing that their reconstruction is a long-term process. This situation can be applied to any economic entity, but the correlation between investment activity, the economic situation and the enterprise itself is different depending on the size of the entity, the industry or the methods of financing the activity.

## 2. Comparative Analysis of the Gross Fixed Capital Structure Formation in Poland and Selected EU Countries in 2004-2020

In this article, research methods including an analysis of literature on micro and macroeconomics were applied. Statistical materials of the Central Statistical Office (GUS) and Eurostat were used to deepen the analysis. The exploration was complemented by the state of the research, which is included in specialized reports.

Comparing the Polish economy with other countries, the decreasing dynamics of investments in comparison to GDP draws attention. While countries with a higher level of economic development, *i.e.*, Germany or France, show a constantly growing trend, in Poland a high growth is visible just after the period of accession to the European Union, and then, from 2008 the trend is visibly declining.

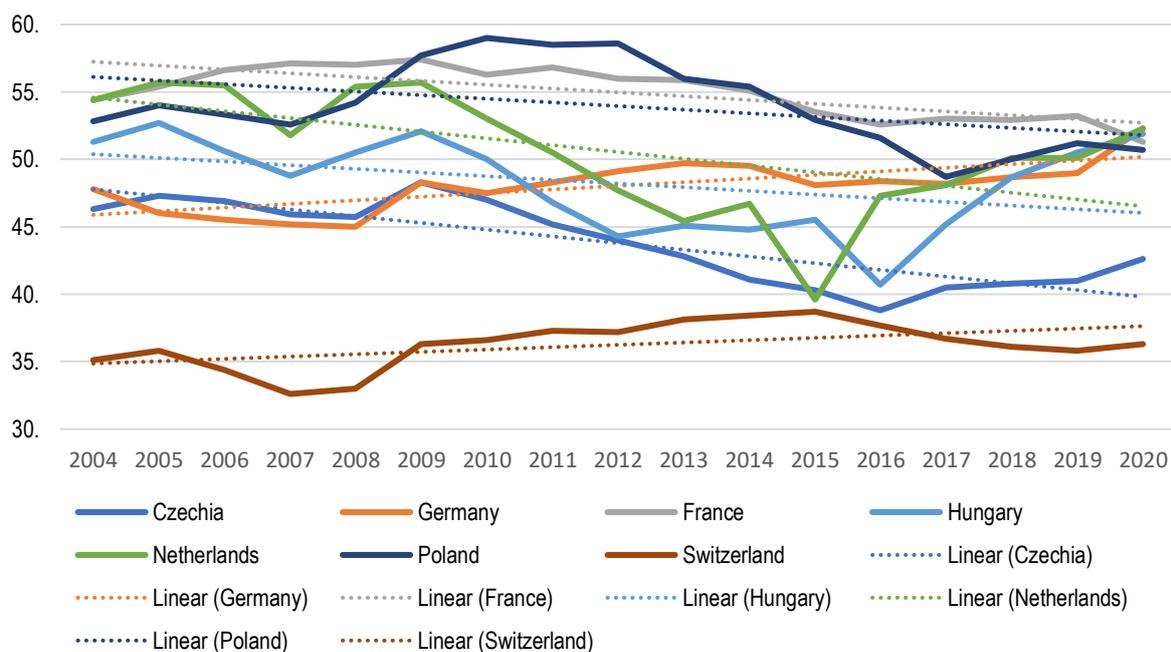
Figure 1. Gross fixed capital formation in gross domestic product for selected countries for 2004 - 2020, (%)



Source: own study based on tables "Annual national accounts, Gross fixed capital formation by AN\_F6 asset type", Eurostat, <https://ec.europa.eu/> (accessed 09.08.2022).

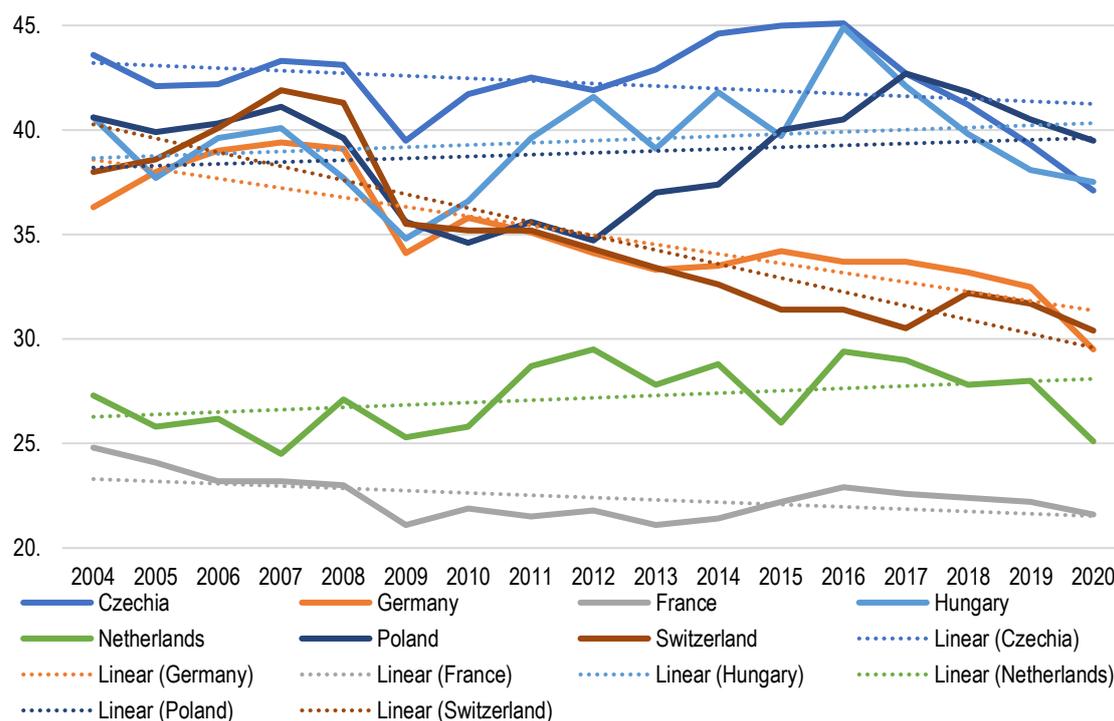
Of the countries with a high level of development, only the Netherlands shows a slight slowdown, triggered by significant changes in expenditures in 2014, but this is not as drastic as in Poland and a return to a steady level is visible. Considering the level of development of the mentioned countries, it is noteworthy that countries with a relatively lower level of development, such as Poland, the Czech Republic and Hungary, are characterized by high fluctuations and variation in investment expenditure. The inconsistency in fixed capital expenditure may result in a still existing development gap, as the accumulation of fixed and human capital generates pro-growth incentives.

Figure 2. Total construction expenditure in gross fixed capital formation in selected countries for 2004 - 2020, (%)



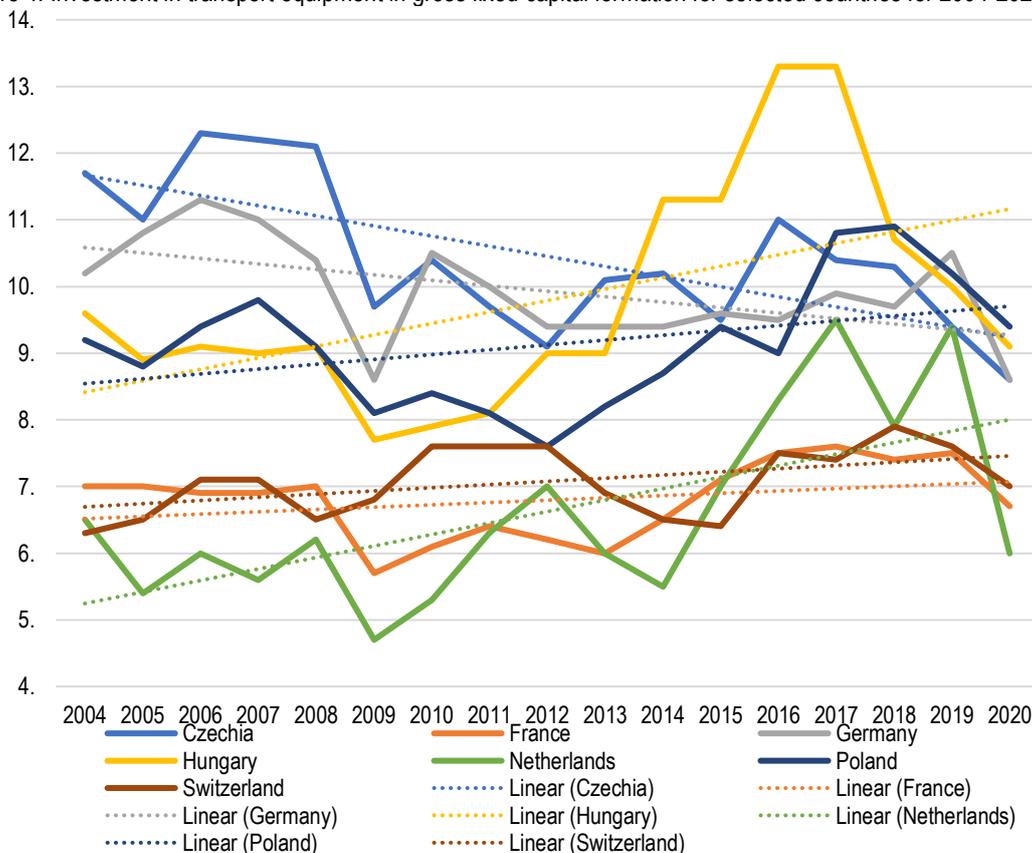
Source: own study based on tables "Annual national accounts, Gross fixed capital formation by AN\_F6 asset type", Eurostat, <https://ec.europa.eu/> (accessed 09.08.2022).

Figure 3. Investment in machinery and equipment in gross fixed capital formation for selected countries for 2004-2020 (%)



Source: own study based on tables "Annual national accounts, Gross fixed capital formation by AN\_F6 asset type"

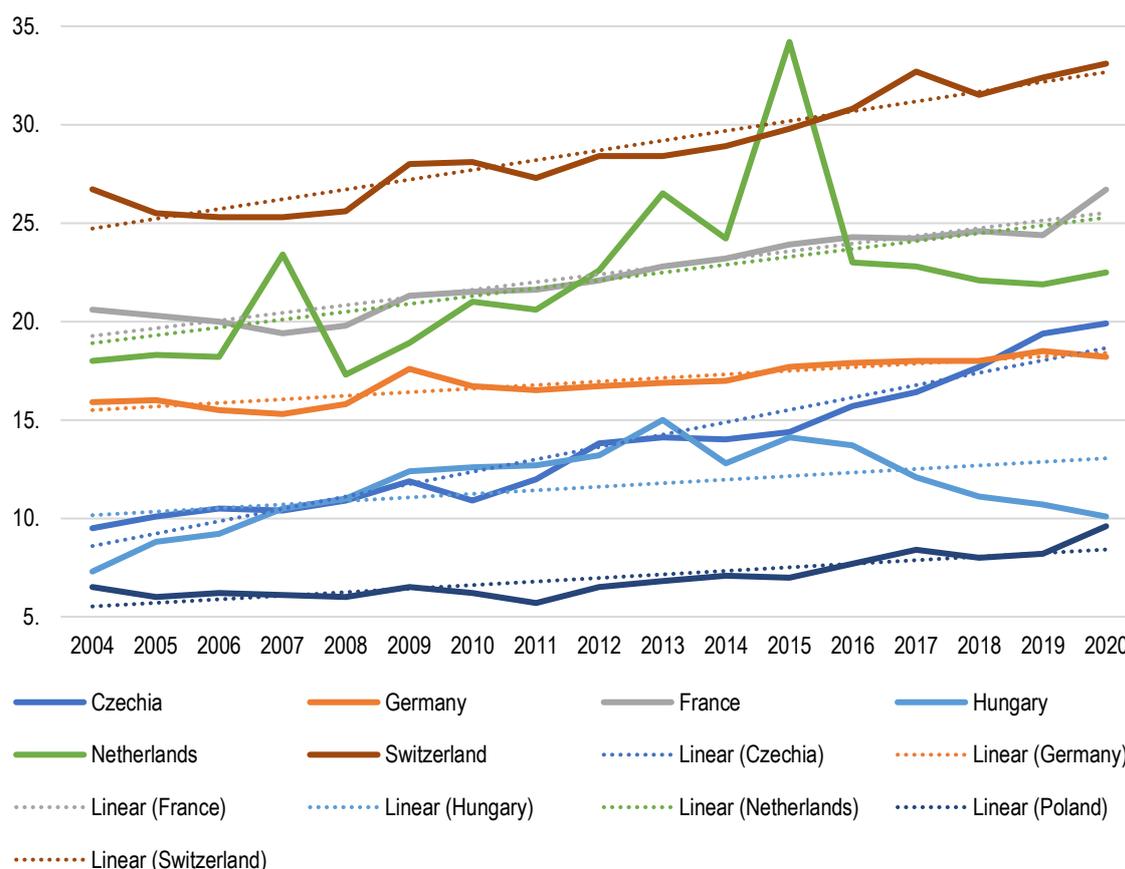
Figure 4. Investment in transport equipment in gross fixed capital formation for selected countries for 2004-2020 (%)



Source: own study based on tables "Annual national accounts, Gross fixed capital formation by AN\_F6 asset type"<sup>2</sup>

<sup>2</sup> Eurostat, <https://ec.europa.eu/> (accessed 09.08.2022).

Figure 5. Investment in intellectual property products in gross fixed capital formation for selected countries for 2004-2020 (%)



Source: own study based on tables "Annual national accounts, Gross fixed capital formation by AN\_F6 asset type"<sup>3</sup>

In terms of the specific structure of gross fixed capital formation, construction investment remains the leader among the sections absorbing the largest percentage of investment. Over the years, the largest share of this group of investment in capital expenditure has been shown by France (55% in 2004 and 51% in 2020). In contrast, Switzerland ranks last out of the group of countries analyzed (around 30%). Interestingly, only Switzerland is one of the two countries, along with Germany, to show an upward trend in construction investment against all investment expenditure. Poland, on the other hand, shows a decreasing trend, but is still among the leaders, constantly exceeding 50% in expenditure on construction assets.

In second place are expenditures on machinery and equipment, where Poland remains the undisputed leader and, among the analyzed group of countries, has exceeded the result of 40 per cent of total expenditures in 2018-2020. The Czech Republic remains in second place with an overall decreasing trend. Interestingly, the largest decreases are seen in Germany (from 36% in 2004 to 29% in 2020) and Switzerland (from 38% in 2004 to 30% in 2020). The lowest ranking remains the Netherlands (around 25%) and France (around 21%).

Another category analyzed is expenditure on transport equipment. Poland and Hungary show the strongest upward trend, which may be explained by the relatively late introduction of new solutions for purchasing transport equipment, *i.e.*, leasing, to national markets. In Poland, an additional incentive may remain the facilitation of including transport equipment in business expenses, which may create a valid basis for reducing the income tax base. However, undoubtedly, transport equipment, as a basic tool of work, show an increasing trend in almost every country analyzed. Only the Czech Republic and Germany show a decreasing share of this type of investment in total expenditure.

When analyzing the category related to intellectual property, it is worth noting that all countries analyzed show an upward trend in expenditure on intellectual property products. The biggest increase is shown by Switzerland (from 27% in 2004 to 33% in 2020), the Netherlands (from 18% in 2004 to 23% in 2020), France (from 20% in 2004 to 27% in 2020) and Germany (from 16% in 2004 to 18% in 2020). This may explain the decreasing

<sup>3</sup> Eurostat, <https://ec.europa.eu/> (accessed 09.08.2022).

trends in the 'traditional' fixed capital expenditures of developed countries. At the bottom of the classification is Poland, where, despite the increasing share of this type of expenditure in total outlays, it has not exceeded 10 % over the years (6.5% in 2004 and 9.6% in 2020).

## Conclusion

Poland is one of the countries with high GDP growth over the years. However, with GDP growth, a decreasing trend can be seen in the sphere of investment expenditures. Investments lead to cost reductions, improvements in work safety and hygiene, increased labor productivity and environmental protection, which results in improved competitiveness of enterprises. The rate of accumulation of fixed capital in Poland is not sufficient to close the growth gap in relation to highly developed countries. Identification of this dependency is an important element in monitoring the dynamics of development processes, and also provides an opportunity to assess external risks. It is also important to relate the level of investment to cash flow and the fact that the Polish economy opened up to foreign investment after 2004. Polish enterprises may have problems in creating investment expenditure in a situation of insufficient profits caused by increased competition. One of the key roles in the economic development process is manifested in the ability to accumulate and make capital available in the right place, quantity and time. This mobility is the result of a strong financial resource base of foreign investors. This allows efficient functioning on a given international market, while at the same time being an initiator of the development of competition and modern solutions in the production process, through the use of appropriate development strategies and investments. However, this factor, requires in-depth analysis in relation to the Polish economy.

The most noticeable is the lack of activity of Polish entities in the sphere of investments in intellectual property products. A survey conducted by the Polish Agency for Enterprise Development (2020) shows that low activity of companies in innovative activity, including R&D works, is a result of existing barriers. Companies that are not innovatively active in 2017-2019, as reasons for not undertaking innovative activity, most often indicated the belief that in a given industry innovation is not necessary to achieve market advantage (41% of all companies that are not innovatively active). Further reasons were the lack of justification for undertaking innovative activities due to the scale of activity (23%) and the lack of sufficient financial resources (19%). In addition, 9% of companies indicate a lack of appropriate personnel and knowledge. On the other hand, companies that are innovatively active in 2017-2019 indicate strong competition in the industry (55% of indications), administrative barriers related to bureaucracy, the approach of bureaucrats to entrepreneurs (45%), complicated and unadapted to the specificity of innovative activity legal regulations (42%) as key barriers to the development of innovative activity. As many as 41% of innovatively active enterprises indicate the shortage of qualified employees with high competences.

## References

- [1] Allayannis, G., Mozumdar, A. (2004). The Impact of Negative Cash Flow and Influential Observations on Investment-Cash Flow Estimates. *Journal of Banking and Finance*, 28(5), 901-930. [https://doi.org/10.1016/S0378-4266\(03\)00114-6](https://doi.org/10.1016/S0378-4266(03)00114-6)
- [2] Almeida, H., Campello, M., Weisbach, M. (2004). The Cash Flow Sensitivity of Cash. *Journal of Finance*, 59(4), 1777-1804. <https://doi.org/10.1111/j.1540-6261.2004.00679.x>
- [3] Begg, D., Fischer, S., Dornbusch, R. (2003). *Makroekonimia, wydanie III zmienione* [Macroeconymy, 3<sup>rd</sup> Revised Edition]. PWE. ISBN: 83-2081-435-9.
- [4] Bond, S., Elston, J., Mairesse, J., & Mulkay, B. (2003). Financial factors and investment in Belgium, France, Germany and the UK: a comparison using company panel data. *Review of Economics and Statistics*, 85(1), 153-165. <http://www.jstor.org/stable/3211629>
- [5] Chenery, H. B. (1952). Overcapacity and the Acceleration Principle. *Econometrica*, 20(1), 1—28. <https://doi.org/10.2307/1907804>
- [6] Clark, J. M. (1917). Business Acceleration and the Law of Demand: A Technical Factor in Economic Cycles. *Journal of Political Economy*, 25(1), 217-235. <http://dx.doi.org/10.1086/252958>
- [7] Cleary S. (1999). The relationship between Firm Investment and Financial Status. *The Journal of Finance*, 54(2), 673-692. <https://doi.org/10.1111/0022-1082.00121>
- [8] D'Espallier, B., Vandemaele, S., & Peeters, L. (2009). Corporate Investment and Financing Constraints: Analysing Firm-Varying Investment-Cash flow Sensitivities. *Review of Business and Economics*, 54(4), 461-488.

- [9] Dąbrowski, A., & Wojtyła, A. (2018). *Czy krajom na średnim poziomie rozwoju zagraża sekularna stagnacja?* [Are middle-level countries threatened by secular stagnation?]. PWN. ISBN: 978-8301206505
- [10] Dokurno, Z., Fiedor, B., & Scheuer, B. (2017). *Contemporary Macroeconomics from the Perspective of Sustainable Development*. PWN. ISBN: 978-8301196127
- [11] Fazzari S. M., Hubbard, R.G., & Petersen, B. P. (1988). Financing Constraints and Corporate Investment. *Brookings Papers on Economic Activity*, 19(1), 141-195. <https://doi.org/10.2307/2534426>
- [12] Gilchrist, S., & Himmelberg, Ch. P. (1995). Evidence on the role of cash flow for investment. *Journal of Monetary Economics*, 36(3), 541-572. [https://doi.org/10.1016/0304-3932\(95\)01223-0](https://doi.org/10.1016/0304-3932(95)01223-0)
- [13] Gupta, G. (2022). CEO's educational background, economic policy uncertainty and investment-cash flow sensitivity: evidence from India. *Applied Economics*, 54(5), 568 - 579. <https://doi.org/10.1080/00036846.2021.1967279>
- [14] Gupta, G., & Mahakud, J. (2019). Alternative measure of financial development and investment-cash flow sensitivity: evidence from an emerging economy. *Financial Innovation*, 5(1). <https://doi.org/10.1186/s40854-018-0118-9>
- [15] Hall, R. E., & Jorgenson, D. W. (1967). Tax Policy and Investment Behavior. *The American Economic Review*, 57(3), 391 – 414. <http://www.jstor.org/stable/1812110>
- [16] Helpman, E. (2010). *The Mystery of Economic Growth*. The Belknap Press of Harvard University Press. ISBN 978-0674046054
- [17] Hernando, I., & Martínez-Carrascal, C. (2008). The impact of financial variables on firms' real decisions: evidence from Spanish firm-level data. *Journal of Macroeconomics*, 30(1), 543-561. <https://doi.org/10.1016/j.jmacro.2006.08.004>
- [18] Hirshleifer, J. (1965). Investment Decision under Uncertainty: Choice—Theoretic Approaches. *The Quarterly Journal of Economics*, 79(4), 509-516. <https://doi.org/10.2307/1880650>
- [19] Hovakimian, G., & Titman, S. (2006). Corporate Investment with Financial Constraints: Sensitivity of Investment to Funds from Voluntary Asset Sales. *Journal of Money, Credit, and Banking*, 38(2), 357-374. <http://dx.doi.org/10.1353/mcb.2006.0034>
- [20] Jorgenson, D. W. (1971). Econometric Studies of Investment Behavior: A Survey. *Journal of Economic Literature* vol. 9(4), 1111-1147. <https://www.jstor.org/stable/2721137>
- [21] Kamerschen, D. R., & McKenzie, R. B. (1991). Nardinelli C., *Ekonomia* [Economy], F. G. NSZZ "Solidarność". ISBN 8300035451
- [22] Kaplan, S. N., & Zingales, L. (1997). Do investment-cash flow sensitiveness provide useful measures of financing constraints? *Quarterly Journal of Economics*, 112(1), 169–215. <https://doi.org/10.1162/003355397555163>
- [23] Knox, A. D. (1952). The Acceleration Principle and the Theory of Investment: A Survey, *Economica*, 19(75), 269-297. <https://doi.org/10.2307/2550657>
- [24] Kopcke, R. W., & Brauman, R. S. (2001). The Performance of Traditional Macroeconomic Models of Businesses' Investment Spending, *New England Economic Review*, 2, 1-39. <http://www.bostonfed.org/economic/neer/neer2001/neer201a.htm>
- [25] Kotler, P. (1994). *Marketing*. Gebethner i Wolff. ISBN 83-85205-42-X
- [26] Kowalczyk, J., & Kusak, A. (2006). *Decyzje finansowe firmy. Metody analizy* [Company Financial Decisions. Analysis Methods]. C.H. Beck. ISBN 83-7483-167-7
- [27] Kylymnik, D., Maliar, S., Maliar, L. (2007). Rich, Poor and Growth-Miracle Nation Multiple Equilibria Revisited. *The B. E. Journal of Macroeconomics*, 7(1), 1-42. <https://doi.org/10.2202/1935-1690.1482>
- [28] Landes, D.S. (1990). Why Are We So Rich and They Are So Poor? *American Economic Review*, 80(2), 1-13. <https://www.jstor.org/stable/2006534>

- [29] Larkin, Y., Ng, L., & Zhu, J. (2018). The fading of investment-cash flow sensitivity and global development. *Journal of Corporate Finance*, 50, 294-322. <https://doi.org/10.1016/j.jcorpfin.2018.04.003>
- [30] Mandziuk, R., Nawra, P., & Ossowska, J. (2016). Inwestycje rzeczowe przedsiębiorstw [Tangible Investments of Enterprises]. *Finanse, Rynki Finansowe, Ubezpieczenia* [Finance, Financial Markets, Insurance], 79(1), 545-553. <https://doi.org/10.18276/frfu.2016.79-43>
- [31] Martínez-Carrascal, C., & Ferrando, A. (2008). The impact of financial position on investment: an analysis for non-financial corporations in the Euro area. *European Central Bank Working Paper Series*, 943, 1-34. <http://dx.doi.org/10.2139/ssrn.1268868>
- [32] Modigliani, F., & Miller, M. H. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *American Economic Review*, 48, 261-297. <http://www.jstor.org/stable/1809766>
- [33] Myers, S. C. (1977). The Determinants of Corporate Borrowing. *Journal of Financial Economics*, 5(2), 147-175. [https://doi.org/10.1016/0304-405X\(77\)90015-0](https://doi.org/10.1016/0304-405X(77)90015-0)
- [34] Nehrebecka, N., & Jarosz, M. (2012). Wpływ sytuacji finansowej polskich przedsiębiorstw na inwestycje w kapitał trwały [Influence of the financial situation of Polish enterprises on investments in fixed capital]. *Gospodarka Narodowa* [The Polish Journal of Economics], 258(9), 15-38. <https://doi.org/10.33119/GN/101000>
- [35] Polska Agencja Rozwoju Przedsiębiorczości [Polish Agency for Enterprise Development]. (2020). Monitoring innowacyjności polskich przedsiębiorstw. Wyniki III edycji badania. [Monitoring of innovativeness of Polish enterprises. Results of the 3<sup>rd</sup> Edition of the 2020 survey], 110-117. <https://www.parp.gov.pl/component/publications/publication/monitoring-innowacyjnosci-polskich-przedsiębiorstw-wyniki-iii-edycji-badania-2020>
- [36] Samuelson, P.A., & Nordhaus, W. D. (2010). *Economics*, 19<sup>th</sup> Edition. McGraw Hill-College. ISBN 978-0-07-351129-0
- [37] Sprenger, C., & Lazareva, O. (2022). Corporate governance and investment-cash flow sensitivity: Evidence from Russian unlisted firms. *Journal of Comparative Economics*, 50(1), 71-100. <https://doi.org/10.1016/j.jce.2021.05.004>
- [38] Tobin, J. (1969). A General Equilibrium Approach to Monetary Theory. *Journal of Money, Credit and Banking*, 1(1), 15-29. <https://doi.org/10.2307/1991374>
- [39] Tobin, J. (1982). Money and Finance in the Macroeconomic Process, *Journal of Money, Credit and Banking*, 14(2), 171-204. <https://doi.org/10.2307/1991638>
- [40] Wang, X. (2022). Financial liberalization and the investment-cash flow sensitivity. *Journal of International Financial Markets, Institutions and Money*, 77. <https://doi.org/10.1016/j.intfin.2022.101527>
- [41] Wolff, E. N. (1991). Capital Formation and Productivity Convergence Over the Long Term. *The American Economic Review*, 81(3), 565–579. <https://www.jstor.org/stable/2006519>