



DEFINITION OF ENTERPRISES IN THE EUROPEAN UNION, WESTERN BALKANS AND KOSOVO

Vlora PRENAJ¹, Hysen ISMAJLI²

^{1,2} *University of Prishtina, Prishtina, Republic of Kosovo*

Corresponding author's e-mail: hysen.ismajli@uni-pr.edu

Abstract. The aim of the present study is to review the definitions of the enterprises in the European Union, Western Balkans and Kosovo. The study also proposes the classification and comparison of small, medium-sized and large enterprises in the European Union, Western Balkan countries, such as Albania, Montenegro, Macedonia, Croatia, Bosnia and Herzegovina, Serbia, and in Kosovo. The study has been performed using the legal, economic, comparative and practice methodology. The results of the study suggest that states should have control over the categorization of enterprises, so the enterprises with higher economic power cannot have the opportunity to hurt those with lesser economic power, all based on the regulation law and its implementation in practice.

Keywords: *Definition of enterprises, the European Union, Kosovo, Western Balkans.*

INTRODUCTION

In any scientific discipline, definitions are very important; based on this fact, in the categorisation of definitions of small, medium-sized and large enterprises, legal and practical ways of functioning should be taken into consideration. The classification of enterprises depends on the level of development of enterprises and the level of development of the economy of the countries.

By comparing the definitions of small, medium-sized and large enterprises in the European Union, Western Balkans and Kosovo, useful material will be provided for scientists, researchers and practitioners in this field.

The study presents the definitions of the enterprises in the European Union, Western Balkans and Kosovo, and proposes the classification and comparison of small, medium-sized and large enterprises in the European Union, Western Balkan countries, such as Albania, Montenegro, Macedonia, Croatia, Bosnia and Herzegovina, Serbia, and in Kosovo. At the end of the paper, conclusions and recommendations are proposed.

1. THE PURPOSE OF THE RESEARCH

The main purpose of this study was to present definitions of the enterprises used in the European Union, Western Balkans and Kosovo. In addition the study present classification and comparison of micro, small, medium-sized and large enterprises in the European Union, Western Balkan countries, such as Albania, Montenegro, Macedonia, Croatia, Bosnia and Herzegovina, Serbia, and in Kosovo.

2. METHODOLOGY

This issue was treated using legal, economic, comparative and practice methodology in order to be comprehensible.

The legal analysis of this topic is important because without legal regulation there is no establishment, operation and development of domestic and international businesses. Economic analysis is complementary and interoperable with legal analysis, adding market practices created and used by traders. Comparative analysis is used to compare the definitions of small, medium-sized and large enterprises of the European Union with Western Balkans as well as with Kosovo. Secondary data were used to make comparisons of the enterprises.

3. DEFINITION OF ENTERPRISES IN THE EUROPEAN UNION

“Small and medium enterprises (SMEs) are the backbone of our economy, creating more than 85 percent of new jobs in Europe and we have to free them from burdensome regulation”, said the President of the European Commission, Jean-Claude Juncker (European Commission, 2015b). Small and medium-sized enterprises should be a national legislative strategy for each country, as well as at international level, with multilateral treaties and conventions. At the national level, states aside from the creation of laws, bylaws, and administrative instructions should also set up development mechanisms that need to be financially supported in order to achieve sustainable development of enterprises. Since most of the theorists point out that these enterprises are the largest developers of the country, it must ensure that national laws are aligned with the laws of other European Union Member States in order to be competitive in the international market as well.

According to the European Union (European Commission, 2015b), nine out of ten enterprises belong to an SME, also SMEs generate two out of every three jobs. In countries without internal borders, in a single market and in an increasingly globalised business environment, it is important that measures in support of SMEs are based on common definitions. Throughout the EU, a common definition helps SMEs improve the sustainability and effectiveness of SME policies. On the other hand, the lack of a common definition can lead to the application of unequal policies and, thus, distort competition throughout the EU Member States.

The statistical definition of SMEs usually ranges from one country to another. To improve the sustainability and effectiveness of SME policies, the legal infrastructure should be harmonised first, then the practice should be unifying so

that SMEs, regardless of where they operate, are equal and competitive in the market. The European Commission through a guide that came into effect from 1 January 2005 determines the criteria for defining an enterprise. To define the category of enterprise, the SME definition takes into account the following three criteria (European Commission, 2015b):

- 1) number of employees;
- 2) annual turnover;
- 3) annual balance sheet.

An enterprise can be determined whether it is a micro, small or medium-sized enterprise by comparing its data with these three criteria, but it does not mean they change status if they exceed one of these parameters (European Commission, 2005). Definition of small and medium-sized enterprises, according to the European Union standards, is represented in Table 1.

Table 1. Definition of small and medium-sized enterprises according to the European Union standards

Enterprise category	Headcount: Annual work unit (AWU)	Annual turnover, EUR	Annual balance sheet total, EUR
Medium enterprise	< 250	≤ 50 million	≤ 43 million
Small enterprise	< 50	≤ 10 million	≤ 10 million
Micro enterprise	≤ 10	≤ 2 million	≤ 2 million

Source: European Commission (2005).

The categorisation of micro-enterprises, small and medium-sized enterprises includes those enterprises employing fewer than 250 employees, with annual revenue of no more than EUR 43 million. Micro-enterprises are defined as enterprises that employ fewer than 10 employees and whose annual turnover or annual balance sheet total does not exceed EUR 2 million. Small enterprises are defined as enterprises employing fewer than 50 employees and their annual turnover or annual balance sheet does not exceed EUR 10 million. While medium-sized enterprises are defined as enterprises that employ fewer than 250 employees and either have an annual turnover that does not exceed EUR 50 million, or an annual balance sheet that does not exceed EUR 43 million.

According to the EU, the number of employees is the main parameter in the categorisation of enterprises. The number of employees is counted as a mandatory criterion to determine whether an enterprise can be considered an SME and in which category of SME it falls. If an enterprise does not meet it, it does not enter any category of SME. The number of employees for the classification of enterprises can be practical, but it is not a determinant in the categorization of enterprises, taking into account the development of technology. The basic and mandatory determinant is the legal norm set by the competent institutions.

The second criteria the annual revenue is determined by calculating the income the enterprise receives from sales or services during the year. The revenue should not include a value-added tax (VAT) or other taxes, while the total annual balance calculated as the last criteria refers to the value of the main assets of the enterprise.

4. DEFINITION OF ENTERPRISES IN WESTERN BALKANS

4.1. Classification of Enterprises in Albania

Analysing SMEs in Western Balkans, it will be found out how SMEs are handled in Albania. According to (The World Bank, 2014), small and medium-sized enterprises are the engine of an economy, and Albania is an example of such a case.

Shkelqim Cani, Albania’s Finance Minister, states that “SMEs are the main engine of the Albanian economy and should be avoided unnecessary and costly administrative burdens on them (The World Bank, 2014). Financial reporting requirements should reflect this approach and be consistent with the nature and characteristics of our economy”.

Based on different sources, we can also obtain various definitions regarding the classification of SMEs in Albania. Law No. 8957, dated 17 October 2002 for Small and Medium Enterprises, regulates measures and policies for classifying, promoting the creation and development of SMEs. The law aims at assisting SMEs through the creation of an institutional, regulatory and financial framework (Law on SMEs Support, 2002). Based on Law No. 10042, dated 22 December 2008 for some changes and additions in Law No. 8957, dated 17 October 2002 “For Small and Medium Enterprises”, enterprises are classified as micro-enterprises, small enterprises, medium enterprises and large enterprises. Classification of enterprises by size in Albania is shown in Table 2.

Table 2. Classification of enterprises by size in Albania

Classification of enterprises	Number of employees
Micro Enterprise	1 to 9 employee
Small Enterprise	10 to 49 employee
Medium Enterprise	50 to 249 employee
Large Enterprise	250 + employee

Source: Law on Supporting SMEs in Albania (2008).

According to (INSTAT, 2016), micro-enterprise is an enterprise, which has fewer than 10 employees and has a net sale and/or annual balance sheet not exceeding 10 million ALL (Albanian lek). In its turn, a small enterprise is called an enterprise that has fewer than 50 employees and which has a net sale and/or annual total balance not exceeding 50 million ALL (INSTAT, 2016).

In terms of categories of micro-enterprise, small and medium-sized enterprises (SMEs) include those enterprises that employ fewer than 250 employees and realize

a net sale and/or total annual balance, not more than 250 million ALL (INSTAT, 2016).

4.2. Classification of Enterprises in Montenegro

The classification of SMEs depends on the level of business development and the level of development of the economy as a whole within each country. Various countries have different criteria in the classification of enterprises, but the most common indicator is the number of employees. Since it is one of the easiest criteria to evaluate, to classify an SME is best to use the number of employees.

In Montenegro, the number of companies refers to the number of registered businesses, adjusted in accordance with the requirements of Regulation 295/2008 (Enterprise operations, 2016). Classification of enterprises by size in Montenegro is shown in Table 3.

Table 3. Classification of enterprises by size in Montenegro

Classification of enterprises	Number of employees	Annual turnover, EUR	Total assets, EUR
Small Enterprise	1 to 49	< 10 000 000	< 10 000 000
Medium Enterprise	50 to 249	10 000 000 to 50 000 000	10 000 000 to 43 000 000
Large Enterprise	> 250	> 50 000 000	> 43 000 000

Source: Statistical Office – Montenegro.

Small enterprises are enterprises that employ between 1 and 49 employees, with annual turnover of up to EUR 10 000 000, medium-sized enterprises employ 50–249 employees, with annual turnover of up to EUR 50 000 000 and large enterprises have over 250 employees, with annual turnover from EUR 50 000 000 and more.

The classification of enterprises by size, based on this criterion, uses the annual average of employment and not employment on a given date, as well as turnover and available assets on an annual basis (Statistical Office of Montenegro, MONSTAT, 2012). According to MONSTAT, small enterprises (98.7 %) are dominating in Montenegro.

4.3. Classification of Enterprises in Macedonia

SMEs are often the largest job providers, especially the new jobs and the predecessors of future large enterprises, an important step for the expansion of micro-enterprises. They contribute directly to collecting savings and investments and are involved in the development of appropriate technology (Berry, 2007).

The classification of SMEs in Macedonia is regulated by law; their definition is based on the number of employees and the annual turnover. Classification of enterprises by size in Macedonia is represented in Table 4.

Table 4. Classification of enterprises by size in Macedonia

Classification of enterprises	Number of employees	Annual turnover, EUR	Total assets, EUR
Micro Enterprise	< 10	< 50 000	–
Small Enterprise	< 50	< 2 000 000	< 2 000 000
Medium Enterprise	< 250	< 10 000 000	< 11 000 000
Large Enterprise	250+	–	–

Source: A summary based on the Law on Business Organisations in Macedonia.

According to (Marjanova & Conevska, 2011), the SME sector in Macedonia compared to the European Union has a small scheme of structuring: “the percentage of small enterprises is slightly higher than the European average. The contribution of small enterprises to employment in Macedonia is significantly higher than the European average, while the contribution of medium-sized enterprises is lower”.

According to the State Statistical Office (European Investment Bank, 2016a), SMEs accounted for 99.7 % of the total number of enterprises in 2014, with enterprises with up to 9 employees accounting for up to 90.8 %, enterprises with 10–49 employees had a share of 7.0 % and enterprises with 50–249 employees had a share of 1.8 %.

4.4. Classification of Enterprises in Croatia

In Croatia, the number of employees is one of the criteria for categorising an enterprise; the annual turnover and total assets play an equally important role.

The small and medium-sized enterprise sector represents an important part of the Croatian economy. According to (Fröhlich, 2013), small and medium-sized enterprises in Croatia represent 99.7 % of all enterprises, despite the fact that the SME sector has been affected by the difficult economic situation Croatia experienced in recent years. Criteria for classification of enterprises in Croatia are shown in Table 5.

Table 5. Criteria for classification of enterprises in Croatia

Classification of enterprises	Number of employees	Annual turnover, million EUR	Total assets, million EUR
Micro Enterprise	0–9	2	2
Small Enterprise	10–49	10	10
Medium Enterprise	50–249	50	43
Large Enterprise	250+	–	–

Source: CEPOR (2016).

Micro, small and medium-sized enterprises are an important generator of new employment and annual growth of each national economy.

According to (CEPOR, 2016), in 2014 there were 104 116.00 SMEs operating in Croatia, accounting for 99.7 % of the total number of registered enterprises, 53 % of total income, 68.4 % of employment and 48.5 % of Croatian exports.

4.5. Classification of Enterprises in Bosnia and Herzegovina

Different authors in different countries have used different criteria in the definition of enterprises, and defined them in different ways. Although the assessment criteria differ from the size and complexity of the enterprises, there are still general criteria that define or separate small and medium-sized enterprises compared to large enterprises. Classification of Enterprises in Bosnia and Herzegovina (BiH) (SMEs Development in BH, 2009):

Medium-sized enterprise is a legal entity:

- which employs up to 250 people;
- with annual sales not exceeding 40 million KM (BiH Currency), and/or with a total annual balance of no more than 30 million KM.

Small enterprise is defined as a legal entity:

- which employs up to 50 people;
- with annual total sales and/or total annual balance no more than 4 million KM.

A micro-enterprise is defined as a legal entity:

- which employs up to 10 people and with annual sales and/or balance sheet total not exceeding 400 000 KM.

According to (SMEs Development in BH, 2009), "Enterprise is any entity involved in economic activity, regardless of its legal form, in particular includes self-employed individuals and family businesses involved in crafts or other activities, partnerships and associations regularly involved in economic activities". Most of the enterprises in Bosnia and Herzegovina are SMEs, which are defined by the number of employees and the annual turnover.

4.6. Classification of Enterprises in Serbia

The SME sector in Serbia is a major source of jobs, SMEs make up the bulk of economic activity. According to (Yon & Evans, 2011), while SMEs may be important for developed countries, they are even more important for the developing world, where the unemployment rate and the large gap between the rich and the poor create desperate lifestyle (European Investment Bank, 2016b). Classification of enterprises by size in Serbia is shown in Table 6.

Table 6. Classification of enterprises by size in Serbia

Classification of enterprises	Number of employees
Micro-enterprise	0–9
Small Enterprise	10–49
Medium Enterprises	50–249
Large Enterprise	250+

Source: European Commission (2015a).

According to (European Commission, 2015b), the SMEs sector is at the same level as the European Union average in terms of size distribution of enterprises, where up to 9 employees belong to the micro segment, from 10 to 49 employees make up small enterprises, from 50 to 249 employees – medium-sized enterprises and over 250 employees – large enterprises.

5. DEFINITION OF ENTERPRISES IN KOSOVO

Kosovo has an area of 10 905.25 km² (KCA, 2017), located in south-eastern Europe, bordering Albania in the south-west, Montenegro in the north-west, Serbia in the north-east and Macedonia in the south (Kosovo Agency of Statistics, 2017). Kosovo is characterised by a very young population structure, with an average age of 30.2 years, while the total population is 1 783 531 (2016 census), with 888 198 males and 895 333 females (Kosovo Agency of Statistics, 2017).

According to KSA estimates in 2011, the average life expectancy of two genders in Kosovo was 76.7 years, where women had a higher life expectancy of 79.4 years, and males – 74.1 years. Since the population census is carried out every ten years according to the United Nations rules, for this reason, we have the latest information on population data since 2011 (Kosovo Agency of Statistics, 2017).

In Kosovo, the enterprise is defined by the Law on Supporting Small and Medium Enterprises No. 02/L5 and Law No. 03/L-031 on Amending and Supplementing the Law No. 02/L5 on SMEs (Law on SMEs Support in Kosovo, 2008). Table 7 represents the classification of enterprises in Kosovo.

Table 7. Classification of enterprises in Kosovo

Classification of enterprises	Number of employees
Micro-enterprise	1 to 9 employee
Small Enterprise	10 to 49 employee
Medium Enterprises	50 to 249 employee
Large Enterprise	to 250 employee

Source: Law on SME Support in Kosovo.

An enterprise to acquire the status of one of the enterprise classification must meet the following criteria: The micro-enterprise must employ 1 to 9 employees; the small enterprise must employ 10 to 49 employees; the medium enterprise must employ 50 to 249 employees and the large enterprise – over 250 employees. Enterprises are defined by the Law on Support to Small and Medium Enterprises No. 02/L5 and Law No. 03/L-031 on Amending and Supplementing the Law No. 02/L5 on SMEs (Law on SMEs Support in Kosovo, 2008). Laws No.02/L5, No.03/L-031 on amending and supplementing the Law No. 02/L5 on SMEs have been repealed with the entry into force of Law No. 04/L-220 on Foreign Investments in Kosovo. The abolition was due to the advancement of businesses and the harmonisation of the Law on Foreign Investments in Kosovo in relation to European practices.

In addition to the SME classification in Kosovo according to the law on SME support in Kosovo, enterprise size classification is also done according to the guidelines 02/2016 of Law No. 04/L-014 on Accounting, Financial Reporting and Auditing, KFRC.

According to the Guide 02/2016 of the Law No. 04/L-014 on Accounting, Financial Reporting and Auditing, Kosovo Council Financial Reporting (KCFR) defines the criteria by which an enterprise can be classified as large, medium, small, or micro-enterprise, regardless of whether it is registered with the Business Registration Agency within the Ministry of Trade and Industry (MTI) as Individual Business, Partnership, Limited Liability Company, Joint Stock Company (The Assembly of the Republic of Kosovo, 2011).

Classification of enterprises by size in Kosovo is shown in Table 8.

Table 8. Classification of Enterprises by Size in Kosovo

Classification of enterprises	Number of employees	Annual turnover (net), EUR	Assets (gross), EUR
Micro Enterprise	< 10	< 50 000	< 25 000
Small Enterprise	≤ 10	50 000 to 2 000 000	25 000 to 1 000 000
Medium Enterprise	10 to 50	2 000 000 to 4 000 000	1 000 000 to 2 000 000
Large Enterprise	50+	over 4 000 000	over 2 000 000

Source: KCFR, Ministry of Finance – Kosovo.

An enterprise can be considered a micro-enterprise if it meets two of these three criteria: if the number of employees during the year is less than 10 employees, the total assets are less than EUR 25 thousand and the annual revenue less than EUR 50 thousand. Micro-enterprises, small and medium-sized enterprises are considered SMEs if they meet two of the three criteria. The enterprise is classified as a small enterprise if the number of employees reaches 10 employees, the total assets comprise from EUR 25 000 to EUR 1 million and the annual revenue from EUR 50 000 to EUR 2 million. The medium enterprise employs the number of employees from 10 to 50, with total assets from EUR 1 million to EUR 2 million and annual revenue of EUR 2 million to EUR 4 million. In the last group of companies in

Kosovo, there are large enterprises with over 50 employees, with total assets over EUR 2 million and annual revenue over EUR 4 million.

Although the enterprise has to meet two of the three criteria mentioned above, a large enterprise continues to be such an enterprise even when it does not meet two of the criteria. This is a result of the principle of comparability required under International Accounting Standard I (IAS1). Since the financial statements are presented for two years, the current and the previous year, then if an enterprise was large in 2015, it continued to be large even in the financial year of 2016. To be reclassified to another category, two years should pass (Guidelines 02/2016 KCFR, 2016).

CONCLUSION

As in the countries of Europe, Western Balkans as well as in Kosovo, for the establishment and development of SMEs the main role is played by the legislative strategy, legal regulation, complementary normative acts of law, manuals and guides, which serve as a guiding basis, followed by decisions and recommendations issued by competent institutions. All these are mandatory for SMEs.

Freedom of operation and function of SMEs are within international and national practices depending on where they are operating. Practices are built by businesses to the extent that they do not contradict the rule of law.

SMEs, to be competitive on the market, should follow the guidelines in the country where they operate, and then they consider the quality of products or services, to distinguish one from the other, always taking into account the legal provisions of the competition. What is very important is that the governments have control over the categorisation of enterprises, so the companies with higher economic power cannot have the opportunity to hurt those with lesser economic power, all based on the regulation law and its implementation in practice.

Economic power has correlation with legal power because implementing each other's criteria leads to a competitive, supervised market, which has a direct impact on customer demand. Then the consumers are those who choose the products or services these companies offer.

The results of this study suggest that states should have control over the categorization of enterprises, based on the regulation law and its implementation in practice. Whereas the enterprises with strong economic power cannot have the opportunity to affect those with weaker economic power.

REFERENCES

- Berry, A. (2007). The Importance of SMEs in the Economy. ITD Global.
- CEPOR. (2016). Small and Medium Enterprises Report – Croatia 2015. Zagreb: CEPOR. Retrieved from <http://www.cepor.hr/wp-content/uploads/2015/04/SME-report-2015-ENG-web.pdf>
- Enterprise operations. (2016). Statistical Office of Montenegro – MONSTAT. Podgorica, 2016. Retrieved from <http://monstat.org/userfiles/file/sbs/Poslovanje%20preduzeca%20u%20Crnoj%20Gori%20-2016-%20Eng.pdf>
- European Commission. (2015a). Enterprise and Industry. 2014 SBA Fact Sheet: Serbia.
- European Commission. (2005). User Guide to the SME Definition. Brussels: Publications Office of the European Union.
- European Commission. (2015b). User Guide to the SME Definition. Luxembourg: Publications Office of the European Union.
- European Investment Bank. (2016a). Assessment of Financing Needs of SMEs in the Western Balkans Countries.
- European Investment Bank. (2016b). Serbia. Assessment of Financing Needs of SMEs in the Western Balkans Countries.
- Fröhlich, Z. (2013). Small and Medium Size Companies Competitiveness in Croatian Regional Framework. In *53rd Congress of the European Regional Science Association: "Regional Integration: Europe, the Mediterranean and the World Economy"*. Italy, Palermo, 27–31 August 2013.
- Guidelines 02/2016 KCFR. (2016). Kosovo: Kosovo Council Financial Reporting, Ministry of Finance. Retrieved from <https://mf.rks-gov.net/desk/inc/media/E650C471-246C-4ACE-81A3-F385DF3595FC.pdf>
- INSTAT. (2016). Statistics on Small and Medium Enterprises, 2016. Republic of Albania: Institute of Statistics.
- KCA. (2017). Kosovo Cadastral Agency. Retrieved from Ministry of Environment and Spatial Planning, Republic of Kosovo.
- Kosovo Agency of Statistics. (2017). Statistical Yearbook of the Republic of Kosovo. Prishtina. Retrieved from http://ask.rks-gov.net/media/3636/vjetari_statistikor_i_republik%C3%ABs_%C3%AB_-kosov%C3%ABs_-2017_-final.pdf
- Law on SMEs Support. (2002). Albania.
- Law on Supporting SMEs in Albania (2008).
- Law on SMEs Support in Kosovo. (2008). Kosovo: Assembly of the Republic of Kosovo.
- Marjanova, T., & Conevska, B. (2011). Comparative Analysis of Factors From Marketing and Legal Perspective and Policies That Affect SMEs in Macedonia and EU. In *Proceedings of the Conference "Economic development and entrepreneurship in transition economies"* (pp. 477–490).
- SMEs Development in BH. (2009). Small and Medium-Sized Enterprise Development. Strategy in Bosnia and Herzegovina.
- Statistical Office of Montenegro, MONSTAT. (2012). Analysis of number and structure of business entities in Montenegro for the Second Quarter of 2012. Podgorica: Department for Registers.
- The Assembly of the Republic of Kosovo. (2011). Law No. 04/L-014 on Accounting, Financial Reporting and Audit. Kosovo: Ministry of Finance, Kosovo Financial Reporting Council.
- The World Bank. (2014, June 03). Ministerial Conference: Stronger SMEs for Shared Prosperity – Developing Sustainable Financial Reporting Frameworks in Europe and Central Asia. Retrieved from <http://www.worldbank.org/en/events/2014/05/27/stronger-smes-for-shared-prosperity>
- Yon, R., & Evans, D. (2011). "Thought Paper": The Role of Small and Medium Enterprises in frontier capital markets.

AUTHORS' SHORT BIOGRAPHIES

Vlora Prenaj, (PhD Candidate), is an Assistant at the Bank, Finance and Accounting Department of the Faculty of Economics, University of Prishtina. She has experience of more than 15 years participating in different international projects. She is an Accredited Counselor and Trainer of Consulting and Training of the Voucher scheme of SMEs of Kosova. She is the author and co-author of several scientific publications and she has participated in some international conferences. She has also been for mobility at the University of Bamberg, Germany and University of Nice Sophia Antipolis, France.

ORCID iD: <https://orcid.org/0000-0002-5679-4829>

Hysen Ismajli is a Professor since 1984 at the Bank, Finance and Accounting Department of the Faculty of Economics, University of Prishtina. He received the Master degree from the Faculty of Economics, the University of Zagreb, and a Doctoral degree from the University of Prishtina. He was a Lecturer at the Faculty of Economics, the University of Tetovo in Macedonia during the period of 2002–2006. He has participated in some international scientific conferences; he is also the author and co-author of several scientific publications.

ORCID iD: <https://orcid.org/0000-0002-4251-7900>