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Article

Unlocking regional value chains: Fintech's role in the Western Balkans' integration into global markets

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Abstract. Digitalization and automation are restructuring the geographical landscape of operations and labor, significantly altering operations in global value chains (GVCs). Digital technologies are expected to boost resilience, enhance transparency, and foster sustainability in GVCs. In this context, this paper looks at how the application of fintech solutions fosters the creation of regional value chains (RVCs), increasing attractiveness and generating new opportunities for enterprises in the Western Balkan region to participate in GVCs To fill the existing gap for granular analysis at the industry level, the paper examines if enterprises in the Western Balkans that apply of fintech solutions in financial management have better opportunities to create RVCs than the ones that resist fintech implementation. Using a benchmarking instrument on fintech solutions implemented on 370 enterprises, this paper tries to identify industries with the highest potential to create RVCs and higher prospects for integration in GVCs. Our findings indicate that fintech solutions and applications can be one of the main driving forces in transforming and upgrading RVCs in Western Balkan countries.

Keywords: fintech; global value chains; financial ratio analysis; benchmarking; Western Balkans
JEL classification: C39 ; C51 ; H26

1. Introduction

Global value chains (GVSs) have become increasingly fragmented and dispersed, with a growing number of longer and wider-ranging networks of small- and medium-sized (SME) upstream and downstream enterprises across major international markets. According to Kano et al. (2020) and Kacani and Shaqiri (2023), GVCs comprise a series of stages involved in the production of a product or service that is ultimately sold to consumers. Each stage contributes to the creation of value, and at least two stages are produced in distinct countries. GVCs create global trade routes that connect local producers from emerging economies to global marketplaces. They provide a link between suppliers of the raw materials, the producer, and the final consumer. In the dynamic environment of international markets, technological evolution is one of the main factors influencing how GVCs evolve (Banga, 2020). New technologies are making it easier to reconfigure GVCs. Within the technological evolution, the European Union (EU) has recognized digitalization as a significant catalyst for

economic and social transformation, albeit the process has been characterized as uneven. Digitalization stimulates the upgrading of GVCs as it intensifies research and development expenditure, maximizes resource allocation, encourages technological innovation, empowers digital transformation, augments efficiency, and promotes goodwill and reputation (Sun et al., 2023). In GVCs, digitalization reduces multilateral resistance to trade, expands export market access, increases the export market, and helps exports grow marginally (Elia et al., 2021).

Over the past decade, digitalization has introduced several innovations in GVCs, including fintech solutions. In a nutshell, fintech is a digital record of financial transactions about trade that can be traced in real-time and distributed among participants who possess access rights. Fintech permits actors in GVCs to administer their databases, bringing together all the pertinent data into one digital document (Gleibner et al., 2019). Fintech solutions can be used to preserve, track, supervise, and exchange both physical and digital assets in a way that is both effective and transparent. By implementing this approach, the technology can serve as a trust mechanism that can be easily integrated and utilized, thereby enabling other emerging technologies to attain greater scale. Fintech solutions can also be used to improve the traceability of goods throughout the production process (Arrfelt et al., 2018). Numerous research studies have revealed that the application of fintech solutions exhibits numerous advantages, including the enhancement of openness, confidence, and safety, while simultaneously lowering expenses, resulting in enhanced effectiveness. (Javorcik, 2020).

To continue, global trade can be encouraged due to the availability of smart contracts through fintech solutions. Smart contracts typically refer to software applications that store rules and actions between parties. Fintech solutions provide an opportunity for enterprises operating in GVCs to modify their size and configuration, thereby facilitating firms to reduce transaction costs (Kano et al., 2020). With big data, cloud technology, and powerful algorithms, GVC relationships and work organization have changed. (Le et al., 2021).

Moreover, the application of fintech solutions is expected to boost resilience, enhance transparency, and foster sustainability in regional markets and regional value chains. In line with the global dynamics of GVCs, the new European Union (EU) Regional Innovation Agenda (EURIA) for the Western Balkan countries [1]aims to create regional value chains (RVCs) within the Western Balkan identifying industries that can easily participate in GVCs attracting new investments. According to Pasquali et al. (2020), the concept of regional value chains (RVCs) refers to production and consumption networks that are not globally coordinated, but rather within a single global geographic or administrative zone. RVCs help local economies participating in RVCs to develop political, social, and strategic relationships. This helps the region become more prosperous and grow sustainably. Participation in RVCs can create income and work opportunities, thus reducing poverty. It can also reduce uneven development and intra-regional inequalities (Kacani & Shaqiri, 2023).

Active participation in GVCs brings new perspectives for developing countries and in this case for Western Balkan ones, as they are exposed to new technologies, innovations, and automation (Kacani & Shaqiri, 2023). Given the new landscape in GVCs, this paper examines if enterprises in the Western Balkans that apply fintech solutions in financial management have better opportunities to create RVCs than the ones that resist fintech implementation. The study highlights that enterprises

[1] Western Balkan countries include Albania, Bosnia Herzegovina, Kosovo, Montenegro, North Macedonia, Serbia.

applying fintech solutions in their financial operations have a higher potential to create regional value chains. These enterprises are considered by European ones as better candidates for additional investment and better integration in GVCs (Antonucci et al., 2021). This research contribution starts with a theoretical background followed by a thorough explanation of the benchmarking methodology. The paper continues by presenting the main results and industry trends along with conclusions and policy recommendations both at an industry and regional level.

2. Theoretical background

The rise of globalization has made GVCs even more intricate, involving numerous parties requiring a lot of coordination. This makes it more expensive to run these global networks and move goods and services between countries (Avom et al., 2021). The primary advantage of fintech solutions is the ability to facilitate the introduction of novel business models. In the digital age, enterprises need to make decisions in real-time to stay competitive, by introducing new products more quickly, cheaply, and with better quality (Juliet et al., 2022). Implementation of fintech solutions has the potential to disrupt global trade by facilitating the exchange of real-time data and reducing the expenses associated with delayed information, administrative trade frictions, and logistical obstacles like order delays (Li et al, 2019).

In the literature, the application of fintech solutions stimulates regionalization that is expected to reduce the length of GVCs, concentrating their geographical distribution and promoting exports of high-value goods from regional markets into GVCs (Pananond et al, 2020). Fintech solutions affect GVCs through cost reduction and improvement in communication efficiency. In particular, the implementation of paperless trade practices such as electronic invoices, electronic signatures, pre-clearance of shipments, single windowing, and the utilization of blockchain ledger technology in the supply chain for tax or border compliance processes, has reduced the days and costs needed for international transactions (Meltzer, 2019). Additionally, fintech solutions eliminate information asymmetry, enhancing the value added of exports and promoting the upgrading of RVCs into GVCs (Feroz et al., 2021).

The significance of fintech solutions is valid for both small and large multinational enterprises, as they offer significant advantages in the areas of sales, payment, finance, and logistics. Digitization helps large enterprises transport their goods faster across borders and helps small enterprises overcome problems when exporting (Thun et al., 2021). Fintech solutions empower SMEs to transform their business models by interacting with multi-layered digital platforms and by enhancing existing alliances (Helmerich et al., 2021). By working together, a shared digital platform among SMEs can also be seen as a global virtual value chain characterized by technology and intangible production inputs. SMEs can use fintech platforms to manage their cash flows in a revolutionary way (Kan et al., 2022). Artificial intelligence and transactional data can be used by SMEs to understand transaction histories and make accurate forecasts of their future cash flows. SMEs can make more informed decisions by using this data-driven approach to optimize their working capital and mitigate their risk of insolvency. For example, fintech platforms offer new pathways for SME suppliers to access funds (Lee & Falahat, 2019). By digitizing assets and utilizing

technology, small-scale suppliers can improve liquidity and reduce their financing costs (Liu et al., 2021). By enhancing the resilience of SMEs, these platforms can aid in enhancing the resilience of the entire value chain.

The digital payment landscape has changed thanks to fintech companies like PayPal, Payneer, Apple Pay, and Google Pay (Qi & Ren, 2021). Nowadays, SMEs can digitalize their assets through the utilization of fintech platforms. In addition, the emergence of fintech platforms provides substantial incentives for the procurement and distribution of goods produced in GVCs. The availability of cloud-based information, data analysis software applications, and related information "dashboards" enhances the visibility of the value chain to enable real-time tracking and rapid allocation of resources to meet customer demands. At the same time, these aspects also help deliver service and provide customer care (Niemand et al., 2021).

To continue, the Western Balkan region has recently witnessed a surge in the utilization of fintech services. In the region, the online banking system was used by 8% of account holders com, compared to 58% in the EU. E-commerce is still not widely used in the region, but it is more common than in other countries that recently joined the EU (Gruber, 2019). This trend is also identified in Demirgüç-Kunt et al. (2022), with specific indicators presented in Table 1.

Table 1. Data on the Western Balkans

Country	Used a mobile phone or the internet to check account balance (% age 15+)	Use a mobile phone or the internet to make payments, buy things, or send or receive money using a financial institution account (% age 15+)	Store money using a financial institution or a mobile money account (% age 15+)	Has access to the internet (% age 15+)	Made or received a digital payment (% age 15+)	Used a mobile phone or the internet to buy something online (% age 15+)	Used a mobile phone or the internet to pay bills (% age 15+)
Albania	13%	8%	25%	78%	35%	17%	5%
Bosnia and Herzegovina	35%	18%	48%	92%	67%	31%	13%
Kosovo	14%	10%	31%	93%	48%	29%	10%
Montenegro	39%	23%	n.a	n.a	60%	13%	7%
North Macedonia	37%	30%	43%	88%	74%	31%	28%
Serbia	41%	28%	48%	84%	87%	33%	27%

Source: Demirgüç-Kunt et al. (2022)

The Western Balkan countries are well-known for their troubled past and unstable politics. However, they have been making significant progress in embracing information and communication technologies (ICT) for the past decade (Nguyen et al., 2020). Their growing ICT sector is trying to get attention from investors and global tech enterprises. The Western Balkan countries are well-

positioned for a promising future because of a surge in the region's ICT industry, where well-paying and high-quality employment opportunities have been scarce in the past. It might be what the region needs to catch up with other EU member states in the area (Santo-Jaen et al., 2023).

There has been a steady increase in the importance of RVCs over the last few years. Eliminating trade obstacles and boosting cross-border commerce are expected to streamline business collaboration between enterprises in the region. This, in turn, will allow enterprises to pool their resources, skills, and abilities, and to create more innovative and competitive goods and services. The more enterprises in the region work together, the more foreign investments there will be in the region (McCormick and Somaya, 2020). This will make the regional market in the Western Balkan more stable and easier to integrate into GVCs, creating additional prospects for large enterprises as well as SMEs and start-ups. To continue, the literature argues that developing countries including the Western Balkan ones have made their integration into GVCs faster by creating RVCsthat align with the common goals of GVCs (Radosavljević, 2023). RVCs support developing countries to build better political, social, and strategic relationships with each other. This helps the region grow more economically and sustainably (Kacani et al., 2022).

In particular, the significance of RVCs was amplified during the Covid-19 pandemic. There are many reasons why RVCs have started to appear. First, geographic location helps regions cluster. The clustering of adjacent regions promotes the interaction among nations, resulting in expedited delivery times and enhanced adoption and implementation of innovations in several industries (Wielgos et al., 2021). The lengthy transition into the free-market economy and the slow progress in key structural reforms have hampered the region's competitiveness despite the low salaries paid by its citizens compared to those in European nations (Pournader et al, 2020). To enhance its competitiveness, the economic transformation strategy is currently focusing on altering the business model and adoption of ICT, including fintech solutions that will allow enterprises in the Western Balkan region to absorb new developments in several relevant sectors that are present in international markets like the EU or the United States (US) (Goldfarb & Tucker, 2019).

A few initiatives are currently in place in the region of North Macedonia and Montenegro that involve multiple stakeholders. According to the International Communication Union[2], since June 2019, the innovation office in North Macedonia has been fully operational. Increasing internal capacity to handle fintech issues, spreading awareness about the benefits and dangers of the fintech sector, and assisting market players with regulatory clarity are some of the objectives of the office. The goal is to issue legally non-binding opinions regarding inquiries from fresh market players and innovative products and services. The Office will cover several areas, including digital identity, open banking, tokenization of financial instruments, crowdfunding, crypto assets, and possibilities for developing a central bank digital currency. Its primary objective is to develop a fintech strategy and action plan to help develop fintech activities. The Innovation Office will establish a detailed overview of the fintech sector and investigate the various business strategies in greater detail. The Office will examine the existing legal and regulatory framework to identify where the impediments originate.

[2] https://www.itu.int/dms_pub/itu-d/opb/inno/D-INNO-PROFILE.NORTHMACEDONIA-2023-PDF-E.pdf

In addition, the first and, to date, only Regulatory Sandbox [3]in the Western Balkans was established at the Securities Commission of Montenegro in September 2019. The Securities Commission has established comprehensive regulations that govern the scheme's objectives, criteria, and application procedure. The Sandbox initiative aims to provide a controlled regulatory environment for potential new market entrants and established fintech firms to evaluate financial innovation, particularly in instances where the applicable regulation is inappropriate or unclear. The European Commission will monitor and evaluate the risks associated with new products or services, as well as their compatibility with existing rules, while they're in the Sandbox. To be deemed acceptable, enterprises must present innovative financial solutions that provide distinct advantages to consumers, such as more practical, safer, or cheaper financial services. In return, individuals will derive numerous advantages from participating in the scheme, including the receipt of guidance from relevant authorities, a more lenient approach towards penalties, and a tolerant interpretation of existing regulations based on the principle of proportionality (OECD, 2023).

3. Methodology and case study overview

Financial ratios are widely used by researchers to evaluate the operational performance of enterprises. In the literature, financial ratios are regarded as reliable indicators for evaluating sustainability in both enterprises and industries. In addition, financial ratios are used to assess not only the current financial well-being of enterprises but also their upcoming financial prospects, such as expansion into new markets or intensifying their integration into GVCs. They are estimated to investigate how the previous financial performance of an enterprise compares to enterprises operating in the same industry. Laitinen (2018) argues that financial ratios serve two primary functions. Firstly, they are used to forecast financial outcomes, such as returns, earnings, and late or non-payments. Secondly, financial ratios are considered credible indicators to compare across different industries, a process commonly referred to as benchmarking analysis (Arrfelt et al., 2018). Furthermore, financial ratios are solid indicators of the financial sustainability of enterprises in the existing literature.

To answer our main research questions on whether enterprises implementing fintech solutions have a higher possibility to create RVCs than the ones that do not consider fintech in their financial operations, this paper looks at the financial indicators related to the use of fintech solutions in 370 enterprises that operate in Western Balkan countries. The financial data was taken from a large survey addressed to the management of these enterprises. Relevant data was retrieved for the five years spanning from 2018 to 2022 inclusive. The enterprise selection criteria introduced in Table 2 targeted enterprises that use fintech solutions and operate in more than one market.

[3] Regulatory sandboxes are regulatory instruments that enable enterprises to evaluate and experiment with novel and innovative products, services, or enterprises under the supervision of a regulatory body for a limited duration. The purpose of regulatory sandboxes is to foster business learning, i.e. the creation and validation of innovations in a real-world setting, and to support regulatory learning, i.e. the formulation of experimental legal frameworks to guide and support businesses in their innovation endeavors. https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/733544/EPRS_BRI(2022)733544_EN.pdf

The survey design: The survey was designed to obtain relevant information on the financial performance of enterprises. The questionnaire has three main parts: the first part collects general information about the enterprise, the second one aims to retrieve financial data on the return of fintech investments, and the third part targets fintech operations. The survey was conducted online following a prior introduction of the research objectives and a brief explanation of the methodology. After completing the survey, the authors conducted a focus group to identify the challenges, opportunities, necessary policy implications, and future trends in the use of fintech. The qualitative method enabled us to gather more elaborative responses so to generate meaningful insights into this study.

Population and sample: The population is based on a purposeful sample targeting enterprises operating in the Western Balkan region that met the pre-selection criteria introduced in Table 2. In addition to the selection criteria, the enterprises were selected according to the GICS 2023 industry classification used in the study. To continue, participants in the focus group were selected randomly and included participants from all Western Balkan countries and industries included in the study. A set of closed and open questions were prepared for participants.

Implementation procedure: Data collection was a transparent and simple process as respondents are managers of enterprises and, therefore, aware of the importance of the research process and the benchmarking instrument. Ethical issues were considered, such as respondents' anonymity and confidentiality of the enterprise information.

Table 2: Selection criteria applied for enterprises operating in Western Balkan countries.

No.	Selection criteria	Occurrence in the sample size
1.	Turnover of over 5 million/EUR within the last three years.	• 13% of enterprises in the sample have a turnover of over 10 million /EUR. • 29% of enterprises have a turnover between 7-9 million/EUR. • 58% of enterprises in the sample have a turnover between 5 to 7 million/EUR.
2.	Over 100+ employees	• 11% of enterprises have over 250 employees. • 14 % of enterprises have between 200-250 employees. • 32% of enterprises have between 150-200 employees. • 43% of enterprises have between 100-150 employees.
3.	Provision of services in at least two international markets like the European Union, the United States, etc.	• 22% of enterprises provide services to the regional, European, and United States markets. • 67% of enterprises provide services to the regional and the European market. • 11% of enterprises provide services only to the regional market.
4.	The number of fintech solutions implemented within the last 5 years.	• 12% of enterprises have over 5 FinTech investments. • 36% of enterprises have made between 3 to 5 FinTech investments. • 52% of enterprises have made up to 3 FinTech investments.

Source: Prepared by authors

Table 3: Enterprise classification according to GICS, 2023

No.	Industry	Subindustry	Number of Enterprises Subindustry Level	Total Number of Enterprises
1.	Consumer Discretionary Distribution & Retail	Automotive Retail	21	248
		Apparel Retail	64	
		Computer & Electronics Retail	37	
		Home Improvement Retail	18	
		Home furnishing Retail	26	
		Food Distributors	49	
		Food Retail	33	
2.	Customer Services	Hotels, Resorts & Cruise Lines	59	122
		Leisure Facilities	13	
		Restaurants	35	
		Education Services	17	

Source: Prepared by authors

Enterprises in the sample are categorized into industries and subindustries to obtain a more granular analysis for a specific industry. This way, it will be able to identify the industry trends based on the enterprise application of fintech solutions. Their activity is identified based on responses from the management obtained through the large-scale survey. The final categorization of the operational activity is presented in Table 3 based on the Global Industry Classification Standard (GICS) [4] developed by MSCI and Standard and Poor in two main categories: consumer discretionary distribution and retail and customer services. Initially, for every enterprise, each financial ratio is calculated for five years. The formulae applied are presented in Table 4.

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[4] Please refer to the official website for the latest classification of enterprises introduced in July 2023 https://www.msci.com/our-solutions/indexes/gics

[5] Please refer to the official website for the latest classification of enterprises introduced in July 2023 https://www.msci.com/our-solutions/indexes/gics

Table 4: Financial indicators used to evaluate the degree of fintech applications in enterprises operating in the Western Balkan region.

No.	Financial indicator	Formula	Explanation
1.	Asset turnover from fintech assets	• Asset turnover = Total sales generated from fintech assets / Average total assets	Asset turnover ratio measures the value of sales or revenues generated relative to the value of its assets.
2.	Investment turnover from fintech investments	• Revenues generated from fintech solutions/ (Stockholders' Equity + Debt)	The investment turnover indicates how effectively an enterprise uses its resources to generate revenues.
3.	Account receivables turnover (Days)	• Account receivables turnover= Net annual credit sales generated from fintech solutions/ Average accounts receivables • Account receivables turnover/365 days	The accounts receivables turnover ratio measures the number of times an enterprise collects its average accounts receivable. It measures the efficiency of an enterprise in collecting outstanding balances from clients and managing its line of credit process.
4.	Account payables turnover (Days)	• Account payable turnover= Supplier purchases made through fintech solutions/Average accounts payable • Account receivables turnover/365 days	The accounts payable turnover ratio is used to quantify the rate at which an enterprise pays off its suppliers. It indicates how many times an enterprise pays off its accounts payable during a given period.
5.	Customer lifetime value (5 last years)	• Total net profit generated from customers using enterprise fintech applications / Total net profit generated from all enterprise customers (in %). • The difference is calculated between two periods to indicate the growth rate (in %).	This indicator helps to identify the percentage of profit generated from customers who use fintech applications within the last 5 years. At the same time, it is an indicator that is used to estimate the growth rate of the indicator within the last five years.
6.	Online payments made by customers	• (Number of online payments made from customers through fintech applications / Total number of payments made by customers (in %). • The difference is calculated between two periods to indicate the growth rate (in %).	Indicates the percentage of payments customers made through fintech applications, within the last five years. Also, the growth in the use of fintech applications.
7.	Online payments made to suppliers	• Number of online payments made to suppliers through fintech applications / Total number of payments made to suppliers (in %). • The difference is calculated between two periods to indicate the growth rate (in %).	Indicates the percentage of payments made to suppliers through fintech applications, within the last five years. Also, the growth in the use of fintech applications
8.	Online inventory management	• Time used to manage inventory through fintech Applications – Time used to manage time through non-fintech applications.	Indicates time reduction achieved through the implementation of fintech applications in inventory management. The reduction in time is converted into quicker order delivery to end customers.
9.	Electronic Invoicing	• Number of electronic invoices issued through fintech applications/Total number of invoices (in %). • The difference is calculated between two periods to indicate the growth rate (in %).	Indicates the percentage of invoices issued both to customers and suppliers through fintech applications in the daily operations of the enterprise within the last five years. Also, the growth in the use of fintech applications.

Source: Prepared by authors

After obtaining the results of financial ratios for each enterprise, they are classified according to the range introduced in Table 5, indicating whether there is (i) a low potential for the creation of RVCs, (ii) a middle potential for the creation of RVCs, and (iii) a high potential for the creation of RVCs. These indicators serve as the basis for estimating industry values and applying a benchmark analysis, thus identifying industry trends for the creation of RVCs based on enterprise fintech implementation in financial operations.

Table 5: Benchmarking indicators for fintech applications fintech applications in enterprises operating in the Western Balkan region.

Component	Financial Ratio	Low Potential for Regional Value Chain	Middle Potential for Regional Value Chain	High Potential for Regional Value Chain
Return on fintech investment	Asset turnover from fintech assets	<1	1–1.5	>1.5
	Investment turnover from fintech investments	<0.5	0.5–1	>1
	Account receivables turnover (days)	>10 days	5-10 days	<5 days
	Account payables turnover (days)	>10 days	5-10 days	<5 days
	Customer lifetime value (last 5 years)	<2,000 EUR	2,000–4,000 EUR	>4,000 EUR
Fintech operations	Online payments made by customers	<30%	30%–50%	>50%
	Online payments made to suppliers	<40%	40%-60%	>60%
	Online inventory management	<50%	50%-80%	>80%
	electronic invoicing	<50%	50%-80%	>80%

Source: Prepared by authors

After the calculation of financial ratios, benchmarking is the primary instrument used to evaluate the potential for the creation of RVGs. The notion of benchmarking pertains to a systematic and continuous evaluation of the performance of an enterprise about those of established market leaders, both locally, regionally, and globally. Benchmarking helps enterprises retrieve valuable information to improve their performance. It has been a successful instrument for integration in GVCs because benchmarking can be simplified into learning from the best. The industry benchmarks are calculated using several methods. The two main methods are “the average of ratios” and “the ratio of averages”. The data collected led us to adopt the ratio of averages as a more accurate representation of the relatively small number of enterprises included in the sample and to determine the percentile in which enterprises in the sample are placed, according to Equation 1 in which *y r, t* represents the industry and subindustry, while *A and B* represent ratio components. This approach ensures that outliers do not significantly affect the result.

The results are presented in subindustry segments to mitigate the bias toward extensive categorization of enterprises at the industry level. Similar methodologies have been applied in studies in the literature (Kacani et al., 2022; Kasasbeh (2021). The evaluation indicators of the

benchmarking instrument are based on fintech solutions used in the financial management of enterprises participating in the survey. Indicators include, among others, a reduction in the lead time to perform a financial transaction, the number of automated financial management processes (payments, customer invoicing, payrolls, etc.), customer lifetime value generated through fintech solutions, return on fintech investments, return on fintech assets, etc.

$$(t) = \frac{\sum_i^t A_i(t)}{\sum_i^t B_i(t)} = \frac{E[A_i(t)]}{E[B_i(t)]} \quad [1]$$

The ratio of averages formula was then implemented to measure benchmarking indicators for the subindustry/industry level and judge whether each enterprise included in the sample size performs below or above the estimated industry level. This comparison allows for a better judgment of where each enterprise is positioned. For example, as introduced in Table 6, enterprise A has most financial ratios falling into the middle potential for the creation of regional value chains according to the criteria introduced in Table 4. As such, the final placement for enterprise A has a middle potential for the creation of regional value chains. A similar analysis is applied to enterprises B and C. In case an enterprise has the same number of financial ratios for all categories presented in Table 5, then the final decision is based on the financial ratios with more dominant values (Kiselakova et al., 2018).

Table 6: Example of the category an enterprise falls regarding the creation of regional value using fintech applications.

Scenario	Low Potential for Regional Value (No. of financial ratios).	Middle Potential for Regional Value Chain (No. of financial ratios).	High Potential for Regional Value Chain (No. of financial ratios).	Final Individual Categorization of Enterprises
Enterprise A	3	5	1	Middle
Enterprise B	6	2	1	Low
Enterprise C	2	3	5	High
Enterprise D	3	3	3	Ratios with the highest value will prevail.

Source: Prepared by authors

4. Main results

Our findings indicate that most enterprises demonstrate a medium to low potential in creating regional value chains resulting from fintech applications. With of enterprises in the sample have generally demonstrated a medium to low outsourcing potential. The most affected subindustries are automotive retail (52%) and home improvement retail (61%). These subindustries demonstrate lengthy account receivables over 20 days and have less than 30% of customer payments made through fintech technologies. The lengthy payment cycle results from the type of goods (automobiles, home furniture, electric appliances, etc.) these industries sell to customers goods, which are mostly considered an investment rather than an expense. As such, enterprises in these subindustries prefer to receive bank transfers rather than online payments. However, for the provision of services like

repairs, both customers and enterprises prefer online payments. Differently, in the European value chain, fintech applications are spreading rapidly in the automotive industry, such as the new partnership of Mercedez-Benz Financial Services with AutoGravity applications. This partnership will allow potential buyers to select their car by identifying all nearby dealerships. Users can apply for online financing by having access to Mercedez-Benz lending purchasing options. In addition, in the home retail industry, there is an increase in the buy now, pay later (BNPL) services that are reshaping retail. These platforms allow consumers to make purchases and spread the cost over installment payments, often with low or no interest rates. BNPL services are attractive to consumers who look for flexibility and affordability while making purchases and are reluctant to use traditional credit cards and debt (Kacani et al., 2022). Despite these services having gained much popularity in the European value chain, there are several limitations to implementing such novelties in the Western Balkan countries. Legislative constraints such as limited lump sum amounts of e-payments without declaring the origin of funds amplify the administrative burden for customers to make large purchases such as automobiles or furniture. In addition, the weak supervision of financial institutions, the high risk of payment default, and the dubious source of funds in emerging economies like those in the Western Balkans, restrain head offices in the automotive and home retail from allowing the use of BNPL or online financing (Yue, 2020).

On the other hand, subindustries that demonstrate the highest potential for the creation of regional value chains are hotels, resorts, and cruise lines (42%), apparel retail (38%), and food retail (36%). These are also the industries with the highest level of e-commerce transactions in the region, which boomed, especially during the Covid-19 pandemic. Enterprises in the apparel and food retail re-evaluated their business operating model, acquiring new technological skill sets and making additional fintech investments, especially in blockchain technologies to meet the ever-increasing demand for online sales. As a growing number of individuals made online purchases, it presented novel prospects for emerging enterprises to expand their digital presence and broaden their reach in a broader e-commerce landscape, including operations and services in several countries in the Western Balkans. Fintech innovations are crucial for e-payments and e-commerce, with a few successful examples in the region, such as the Albanian Gjirafa and Serbian Fishingbooker.com. Nevertheless, during a discussion with the management of these enterprises, it was suggested that a multitude of obstacles hindering the advancement of fintech in e-commerce exist. First, e-commerce associations need a special license in Bosnia and Herzegovina, Serbia, and Montenegro. This prevents European firms with a license abroad from attempting to enter the country. Moreover, there are a limited number of payment gateway providers, which results in elevated expenses, and transaction fees for payment processing are a significant expense. A further obstacle to progress is that online sellers may encounter difficulties if, for instance, their business falls under the category of deposit-taking, as it does in Albania. Ultimately, a significant number of customers are required to make payments in cash upon their arrival due to a lack of utilization of electronic signatures, thereby hindering the provision of a favorable user experience (Odorović et al., 2020). Electronic transactions in these subindustries reached over 70%, spanning additional markets like the European one. Enterprises come up with unique ways to communicate and find new ways to improve the customer experience.

For example, in the hospitality industry, fintech is an efficient way to achieve customer loyalty. Using fintech will help enterprises operating in this industry to gain and improve customer loyalty. From a sales perspective, one way is by implementing convertible loyalty points as an online payment option, this is more likely to make customers return and repurchase enterprise services due to their economic benefits. In the apparel retail e-commerce payment solutions, digitized receipts are provided to return clothing items, saving tons of paper used for physical receipts. In supermarkets and other food stores, innovative point-of-sale solutions are driving fintech innovation (Yue, 2022). Retailers are responding to customers' demand for cashless shopping by partnering with new payment platforms, such as cloud-based solutions, as well as contactless payment providers. While in enterprise management, fintech supports enterprises using blockchain, where brands can digitize, track, and trace the entire lifecycle of a product item. With blockchain, enterprises can create an immutable record of all steps in the value chain, capture specific data points, such as sustainability certifications and claims, and provide open access to this data publicly (Truby, 2022). To implement fintech solutions, enterprises had to overcome numerous difficulties, including securing adequate funding for the digital and physical infrastructure, providing continuous training of their employee, and keeping track and updates on the latest fintech developments. The major challenge was to educate customers on using fintech services, particularly age groups that are not well acquainted with using technological innovations, including fintech. Multiple benefits arise by embracing fintech, including improved customer experience, faster delivery times, easier product tracking, and paperless financial management (Nugraha et al., 2022).

Table 7. Benchmarking results for enterprises using fintech applications and operating in the Western Balkan region.

No.	Industry	Subindustry	Low Potential for Regional Value Chain (%)	Middle Potential for Regional Value Chain (%)	High Potential for Regional Value Chain (%)
1.	Consumer Discretionary Distribution & Retail	Automotive Retail	52%	37%	11%
		Apparel Retail	29%	33%	38%
		Computer & Electronics Retail	28%	58%	14%
		Home Improvement Retail	58%	29%	13%
		Home furnishing Retail	54%	28%	16%
		Food Distributors	25%	43%	32%
		Food Retail	29%	35%	36%
2.	Customer Services	Hotels, Resorts & Cruise Lines	27%	31%	42%
		Leisure Facilities	37%	49%	14%
		Restaurants	53%	38%	9%
		Education Services	31%	43%	26%

Source: Prepared by authors

These enterprises succeeded in using fintech solutions to manage their supply chain entirely online, including online monitoring of inventory with order tracking applications, online payments, and electronic invoicing for suppliers and customers, reducing by at least three days the time of receivables and payables. These subindustries are also characterized by a high asset turnover from fintech applications with a ratio of over 3, a high investment turnover with values over 2, and a customer lifetime value exceeding 5,000 euros. Most of the enterprises in these subindustries have already established product and service delivery by opening branches or by establishing partnerships with similar service and product providers in regional countries.

To continue, enterprises with middle potential for establishing regional value chains through the implementation of fintech solutions are the majority in the sample size. Enterprises within this category are providers of both goods and services. They have taken several steps in incorporating fintech solutions into their operations; however, this is most dominant in their interaction with suppliers rather than with customers. As such, these enterprises have an average of six days of accounts payable, with online payments to suppliers reaching almost 60%. In these enterprises, fintech solutions are made mostly as a necessity to interact with international suppliers rather than a decision made by the management to generate a forward-looking initiative for further integration into the regional market. Their reluctance is observed mostly toward customers with minor transactions occurring through fintech applications. In the interviews with the focus group, several obstacles were identified in the application of fintech solutions. Data security has emerged as a priority issue in the digital community, whether it's mobile banking or payment applications. Traditional financial institutions like banks believe they're capable of safeguarding client data. But things are not as easy as we might think when it comes to digital security. Credit card and bank account numbers, addresses, and responses to security inquiries are some of the personal and financial information that fintech applications possess. As such, data breaching is a major risk and highly damaging to users (Ishamuddin et al., 2023). This makes security a top priority for fintech enterprises and users of fintech solutions. Cybersecurity services like pen testing can help reduce the risk in the digital environment. For instance, enterprises are using intrusion detection systems to test the degree of data security. Given the increased threats, it is imperative to contemplate a cybersecurity strategy to safeguard fintech operations within an enterprise. Although these strategies might be costly and require experienced professionals, enterprises within the Western Balkan at early stages may opt to become users rather than providers of fintech applications that have a two-factor authorization, biometric authentication, data encryption, and real-time alerts and notifications. Such fintech applications are widely spread across different segments of GVCs, facilitating both integration and upgrading of regional value chains into GVCs (Truby et al., 2022).

Overall, enterprises operate in a regional environment with relatively tight ties with each other. This is manifested especially in electronic invoicing and online payment transfers made to suppliers and the presence of fintech applications. Notwithstanding the category in which enterprises belong, all of them have made at least two significant investments toward fintech implementation, indicating an unexploited potential for strengthening regional value chains that will lead to further integration into global ones. Our findings indicate that several enterprises can outperform the industry by exhibiting a much higher potential for the creation of sustainable regional value chains (Adeleye et al., 2021).

5. Conclusions and policy recommendations

Our research shows that enterprises in the Western Balkan region have a moderate to weak potential for the establishment of regional value chains, given the slow progress made in the implementation of fintech solutions. Enterprises and policymakers need to foster a business environment driven by a higher degree of fintech transactions to encourage a higher degree of regional interconnection, leading to a higher integration into GVCs (Egwuonwu et al., 2022). Based on the findings of this paper, the creation of regional value chains encouraged through the application of fintech solutions has long-term benefits for Western Balkan countries in improving operational financial transparency and attracting additional investment from foreign enterprises, especially the European ones.

To take full advantage of the EU market, institutional actions need to initiate and implement pre-emptive policies to improve financial infrastructure in the private sector and strengthen regional investment competitiveness (Abou-foul et al., 2021). These policies can be implemented in the framework of global shifts occurring in several GVCs, accelerating integration for enterprises that are more inclined to form regional value chains. In addition, the implementation of joint initiatives and policies to enable the creation of sustainable regional value chains in specific industries brings additional benefits from participation in the EU market (Caputo et al., 2021). This way, enterprises in the Western Balkan region are exposed to new fintech technologies, innovations, and automation. This exposure improves competitiveness and facilitates compliance with international standards in the provision of goods and services, resulting in higher customer satisfaction and compliance with international standards for the provision of goods and services (Dünhaupt and Herr,2021).

Fintech innovations are increasingly based on blockchain technology and artificial intelligence. Blockchain technology has the potential to disrupt traditional value chains by enabling more secure, transparent, and efficient transactions and value exchange. On the other hand, in the coming years, it is expected that AI-enabled systems will speed up cumbersome customs procedures, remove roadblocks, and make it easier for goods to cross borders. Moreover, demand forecasting and visibility platforms powered by AI will be developed to help companies optimize inventory levels and provide real-time visibility in various GVCs. Such optimization will enable enterprises to AI tools to facilitate environmental, social, and governance (ESG) reporting in various industries (Longbin et al., 2021). Namely, AI-enabled analytics can fill disclosure gaps and facilitate sustainable investing. Enterprises in the Western Balkans can follow a gradual implementation approach of such technologies, in their operations. In doing so, they can follow in the footsteps of main counterparties well integrated in GVCs, such as customers, suppliers, or enterprise headquarters, embracing best practices, thus avoiding challenges and failures previously experienced by them. In parallel, the development of continuous training programs for employees to use fintech innovations is mandatory to ensure a smooth transition from traditional operation systems into the new ones based on blockchain and AI. This way, enterprises can collaborate effectively with third-party experts and align expert recommendations with the objectives of implementing fintech in the operations of the enterprise. By doing so, enterprises in the Western Balkan region will find it easier to become integrated into GVCs (Guo et al., 2022).

With the fast-paced developments in information and communication technologies, fintech solutions and applications can be one of the main driving forces behind the transformation and upgrading of regional value chains among Western Balkan countries. Enterprises in the Western Balkan region need to transform their operating business model oriented toward digital technologies such as mobile internet, cloud computing, big data, internet of things, blockchain, and artificial intelligence, to promote the upgrading of several industries in the GVCs (Kacani & Shaqiri, 2023). By working together in sustainable regional value chains aiming at making the application of fintech solutions more common enterprises will be able to increase their competitiveness toward foreign investment. The increase in the use of fintech solutions results in more efficient enterprises in the Western Balkan, thus reducing transaction costs, improving service delivery, exporting to international markets, and upgrading their participation in GVCs.

Even though several Western Balkan countries work together on fintech projects through the European Integration process, there is still room for a regional group to work together on fintech-related regulations. Small national markets, fragmented regulatory frameworks, and the inability to pass licenses to other countries are some of the most common remarks from industry participants. The coordination of her efforts would confer an additional advantage by potentially enabling fintech's to offer their services beyond their domestic markets. Moreover, the protection of consumers who utilize financial services is rarely adapted to digital communication channels. The recently adopted Law on the Protection of Financial Service Consumers in Distance Contracts in Serbia may serve as a valuable model for other countries in the region. Several reforms can be jointly implemented, which include, among others:

- Establish a point of contact or innovation hub within each regulatory body to address fintech-related questions about licensing and clarification.
- Raise awareness of fintech opportunities, and facilitate discussion forums, conferences, or roundtables with relevant industry and consumer stakeholders.
- Establish a regulatory sandbox or innovation center in every country of the region within the financial oversight bodies to allow fintech enterprises and systems to flourish in a controlled testing environment.
- Join forces among regulators from different authorities in each country in the Western Balkans for capacity-building and training to establish a common understanding of fintech and promote cross-border interaction and engagement in this field.
- Collect information about how customers use bank and non-bank financial services and important signs of how the fintech market is changing. This will help industry and regulators talk and understand each other better.
- Revise the payment system regulations are needed to ensure and facilitate the availability of payment systems to non-bank financial service providers.
- Assess the highly challenging prospect of establishing a regional regulatory sandbox, to enable innovative regional fintech solutions to attain crucial economies of scale across borders.

To fully exploit these prospects, regulators, providers, and governments in the Western Balkans must unite and implement the requisite reforms. Adopting modernization and encouraging cooperation,

the economies of the Western Balkans can broaden the range of goods and services offered to end consumers, ultimately positioning the region as an active and spirited contender in the European financial landscape, thus creating a sustainable regional value chain that could be easily fully incorporated into GVCs.

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