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## Wos Based Bibliometric Analysis of Embedded Finance and Applications in Türkiye\*

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### ABSTRACT

*Embedded finance is the integration of banking services into nonfinancial applications and services. The main purpose of this study is to reveal the status of embedded finance applications in Türkiye. The methodology of the study is mixed-methods research design combining conceptual review, empirical web-based content/data collection and analysis, and bibliometric analysis of the Web of Science literature. In the light of the collected data, it is seen that there are very satisfactory embedded finance examples in Türkiye and that consumers adopt embedded finance applications. Additionally, it is seen that there is room for new embedded finance applications to be implemented in Türkiye. To penetrate the market, the growth opportunities are to be determined, the existing talent is to be expanded, the change is to be managed and the necessary transformation is to be provided to lead embedded finance.*

**Keywords:** Embedded finance, Financial Inclusion, Blockchain Technology, Fintech.

**Jel Classification:** F65, G18, G21, O16.

### Gömülü Finansın Wos Tabanlı Bibliyometrik Analizi ve Türkiye'deki Uygulamaları ÖZET

*Gömülü finans, bankacılık hizmetlerinin finansal olmayan uygulama ve hizmetlere entegre edilmesidir. Bu çalışmanın temel amacı Türkiye'de gömülü finans uygulamalarının durumunu ortaya koymaktır. Çalışmanın metodolojisi, kavramsal inceleme, ampirik web tabanlı içerik/veri toplama ve analizi ve Web of Science literatürünün bibliyometrik analizini birleştiren karma yöntemli araştırma tasarımıdır. Toplanan veriler ışığında, Türkiye'de oldukça tatmin edici gömülü finans örneklerinin olduğu ve tüketicilerin gömülü finans uygulamalarını benimsediği görülmektedir. Ayrıca, Türkiye'de yeni gömülü finans uygulamalarının hayata geçirilmesi için alan olduğu görülmektedir. Pazara girebilmek için büyüme fırsatlarının belirlenmesi, var olan yeteneğin geliştirilmesi, değişimin yönetilmesi ve gömülü finansı yönlendirmek için gerekli dönüşümün sağlanması gerekmektedir.*

**Anahtar Kelimeler:** Gömülü Finans, Finansal Kapsayıcılık, Blockchain Teknolojisi, Fintek.

**Jel Kodları:** F65, G18, G21, O16

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## **1. INTRODUCTION**

Financial institutions comprise not only banks, but also other credit organizations, insurance companies, the private pension system and other pension systems, portfolio investment companies, savings and loan associations, brokerage firms, mortgage companies, and credit unions, etc. However, among all these financial institutions an ordinary Turkish citizen would only count banks. This statement is to be reformulated in mid-2020s' Türkiye. The synergy of developments in several branches of science caused the business world to change the way to trade. With the help of rapid and radical changes, the consumers became ready to benefit from new and updated finance facilities. Embedded finance, sometimes called EmFi, is one of those, but labeling it as new would not reflect the truth. Stone had presented a model for solving a central problem of short-term financial management, that is cash planning and credit-line determination. The core of his model is an algorithmic procedure for finding the best cash plan and the associated credit line for a given operating plan and long-term financial plan. The need for computing cash balances necessitates it to be embedded in a financial statement simulator. Saved time, increased accuracy, and quick determination of infeasibility regarding the short-term plan are the benefits of Stone's model (Stone, 1973: 727–728). The hypothesis of the present research is that any person, who had ever purchased something online and even through traditional sales points, might have already crossed paths with embedded finance. Consumers and/or customers benefit from it; so do the vendors and their financial service providers, if any. Murati et al. (2024) put forth that with augmenting customer pull and improved delivery tools; embedded finance will keep growing and affecting well-nigh every sector until 2030. With this potential, it is worth for companies and banks to examine how to distribute their human resources and other sources systematically and strategically regarding embedded finance. Even though Buy Now, Pay Later (BNPL) is not synonymous to embedded finance, it is another financial technology molding consumer purchasing behavior, and as stated by Loomis and Cockayne (2024) has risen dramatically. In order to clarify its difference from embedded finance, some related researches are summarized here. As Cornelli et al. (2023) state BNPL payment schemes let customers pay for their purchases with interest-free installments rather than paying the full amount at checkout. Widely used by consumers for online purchases on e-commerce platforms,

facilitated by the use of scannable barcodes and QR codes, BNPL is rapidly expanding in physical stores too (Cornelli et al., 2023: 62). BNPL loans, generally defined as zero-interest loans repaid in four or fewer installments pay-in-four loans, have grown rapidly in the United States (Shupe and DeLuca, 2025). Cornelli et al. stress that the typical profile of a BNPL user appears high-risk. The majority of BNPL application users across countries are under the age of 35 younger and tech-savvy individuals, including Millennials and Generation Z, who often do not possess credit cards and are generally less financially literate than older generations (Lusardi and Mitchell, 2023: 6). Consistent with this, a survey of US BNPL services reveals that they are more often used by individuals with low-income levels and less educational attainment (Cornelli et al., 2023: 68).

The aim of this study is to define the concept of embedded finance, to analyze its current applications in Türkiye, and to compare these findings with global trends through a bibliometric analysis. This research, will contribute to the literature, especially in Türkiye, where there are not many studies on this subject. Aside the literature study, the research progresses in three ways. First, the infrastructure of embedded finance will be discussed. Next the current situation for the Turkish context will be determined. The data and information on the web sites of the most reliable and popular digital shopping industry members in Türkiye were helpful in determining the way they benefit from embedded finance. The criteria for choosing these Turkish companies are ease of access and nationwide recognition. This is followed by a bibliographic analysis of studies published mainly on Web of Science (WoS), ignoring country data. The criteria for choosing the keywords used in WoS search is that in the preliminary research conducted, these words are mentioned in definitions of each other. Bibliographic analysis will help future research. The choice of specific brands in Türkiye is one of the main limitations of this study. The other limitation lies in the choice of the keywords for WoS search. Regulations are very briefly explained; the way embedded finance impacts accounting procedures and how regulatory bodies will act are possible research topics of prospective studies.

**2. THE INFRASTRUCTURE OF EMBEDDED FINANCE**

Embedded finance is the integration of banking services into nonfinancial applications and services. Hayes (2024) add that companies merge banking, lending, insurance, and investment services with their customer offerings through APIs linked to financial partners. Embedded finance is for companies of all sizes and industries. Embedded finance applications can be used in many sectors. Some examples are (www.mikro.com, 2024)(1) e-commerce sector; embedded payment and credit options can be offered to customers, making their shopping experience easier, (2) Retail sector; stores can offer instant credit or insurance to customers with embedded finance APIs, (3) Software service providers can integrate financial services into their accounting and business management software, (4) Insurance and payment solutions can be offered in the transportation and travel sectors, (5) Healthcare sector; patients can be provided with financing and payment plans, making it easier to access services, (6) Education, real estate, and energy sectors.

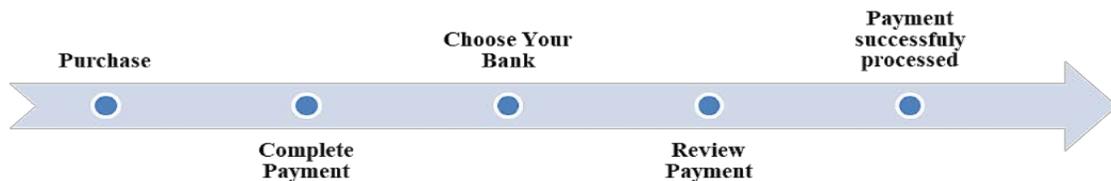
There are global platforms delivering a suite of banking and payments infrastructures. In order to build new products, manage payments, and streamline operations, companies benefit from these infrastructures. With the help of the information on the web site of such kind of a platform which claims that the future of finance is embedded the services embedded finance infrastructures offer are gathered and displayed in Figure 1.



**Figure 1.** Services embedded finance infrastructures offer

Source: Organized based on the information on OpenPayd 28-01-2025, <https://www.openpayd.com/embedded-finance/>.

As seen from Figure 1, such infrastructures enable their customers to receive payments across every major currency from everywhere into a single IBAN. This way, incoming payment related information can be tracked, filtered, and exported. Banking-as-a-Service (BaaS) allows the companies using these kinds of platforms to deliver a suite of banking and payment services to their customers, via a single API. An API gateway is a software pattern that sits in front of an Application Programming Interface (API) or group of micro services to facilitate requests and delivery of data and services. This way, the platform's customer connects to API and integrates the services needed into company's client facing portal. The meaning of this is that platform's customer can offer accounts, payments, foreign exchange (FX) or any other banking services to its clients, without being a licensed bank. Another facility such platforms offer is the Open Banking. By switching to pay by bank, the platform's customer increases conversion, reduces costs, and keeps users in its ecosystem. The platform offers a pool of financial institutions, and embeds Open Banking, which lets users initiate real time payments from their banking applications. The chart shows the payment process with "Open Banking".



**Figure 2.** Payment Process with Open Banking

Source: Organized based on the information on OpenPayd 28-01-2025  
<https://www.openpayd.com/open-banking/>

With the help of account infrastructures, the global platforms enable their customers to open a master account in specific currencies. The customer can start issuing sub accounts (linked accounts) and virtual IBANs (vIBANs) for the underlying customers. These accounts can be combined with multi-currency account infrastructures and pay out functionality. These platforms offer FX management as well. Automated spot pricing and instant settlements are delivered through API. Frequent flyers and customers of digital travel companies are familiar with these kinds of facilities. By accessing local and international payment rails, customers are able to send

domestic and cross-border payments (Global Payouts). As stated by one of the global platforms—OpenPayd, embedded finance allows non-financial businesses to integrate financial services directly into their products and services. The strategic cooperation of such infrastructures’ providers and businesses radically change the way customers access financial services. Among embedded finance solutions, there are (1) Payments, (2) Banking and accounts, (3) FX and treasury, (4) Fintech, (5) Marketplaces and platforms, (6) ForEx and online brokerage, (7) Insurtech, and (8) Digital assets. Figure 3 summarizes these services. Digital payments for digital brokerage platforms, automated reconciliation and access to global payment rails for digital brokerage firms are possible within embedded finance. For trades of currencies, stocks, bonds, commodities, and derivatives, brokerage firms need payment infrastructures for sending and receiving payments; vIBANs enable these transactions. These platforms claim that they bridge the gap between fiat currencies and digital assets, traditional banks have difficulties in delivering payments and banking services to digital asset firms. Debit and credit card payments, bank transfers, Open Banking, automatic reconciliation with vIBANs are to be listed under this category. Another claim, these global infrastructures platforms put forth, is the remittance service. Competitive prices, automated global payments, real-time payments, and forex execution and payment are said to be the basic services.



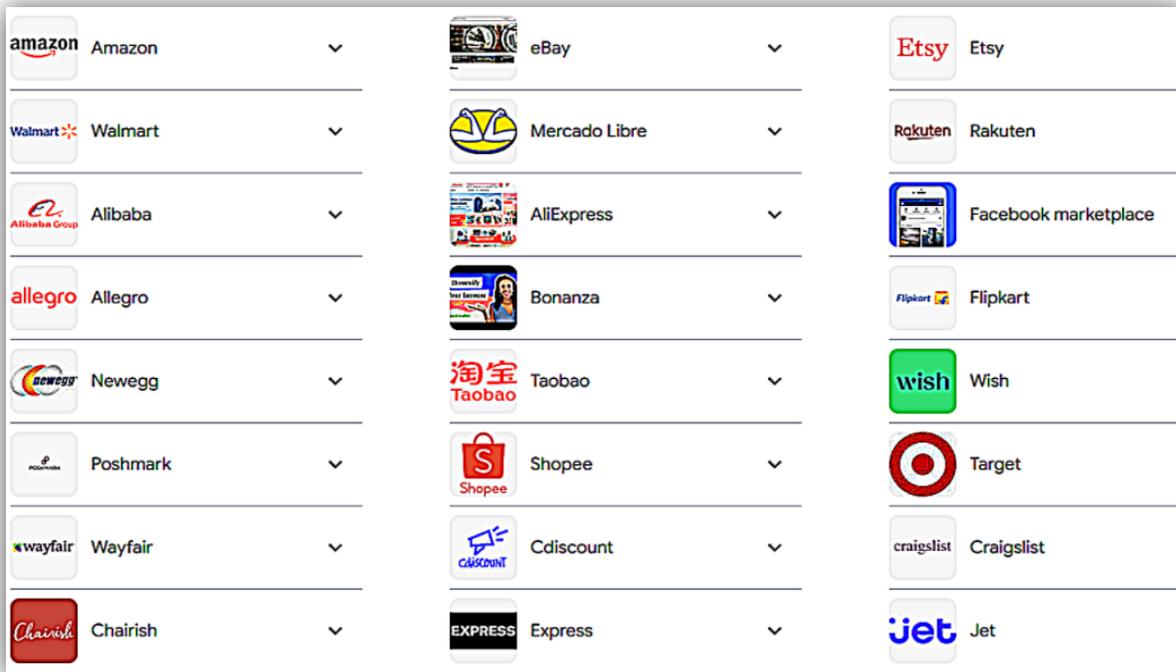
**Figure 3.** Non-Financial Business Integrating Financial Services Directly into Their Products

**Source:** Organized based on the information on OpenPayd 28-01-2025  
<https://www.openpayd.com/open-banking/>.

Embedded payment refers to integrated digital payment systems or digital wallets offered by companies that are not financial institutions. These systems allow users to pay directly and

easily for services or products offered by the company. In this system, which is especially common in the e-commerce sector and is also known as an embedded wallet, the user loads his/her money into the wallet in the system of the company with the embedded financial solution. In other words, the user's money is stored directly in the e-commerce site's system, not in any bank account. Embedded wallets are used not only by e-commerce, but also by companies with physical stores. The most important feature of this system is that the wallet in question is used only for services belonging to the relevant company (Paynet, [www.paynet.com](http://www.paynet.com), 2025). Banking and payments that were a significant cost center for online marketplaces will be turned into a revenue system with the embedded finance. Online marketplaces existing are displayed in Figure 4. Customers of global infrastructures platforms can offer payroll solutions to their clients, by empowering them to manage staff remuneration overseas.

European iGaming is said to be a \$99 billion market ([openpayd.com](http://openpayd.com), 29 Jan 2025). Inadequate payments infrastructure and regulatory coverage had been an issue for gaming businesses until global infrastructures platforms started offering purpose-built payment infrastructures for them. As defined by CFI Team (2025) Insurtech (short for insurance technologies, where Artificial Intelligence, big data analytics, blockchain, and machine learning are used); leverages technology to transform and modernize the traditional insurance sector, revolutionizing how policies are created, underwritten, and managed. It promotes greater customer engagement by offering personalized insurance products based on individual risk profiles and lifestyle choices. Global infrastructure platforms claim to support their customers by managing direct debits and making claims payments, thus letting them to handle payment flows and banking needs.



**Figure 4.** Online Marketplaces as of 29 Jan 2025

Source: Screenshot of Google

Embedded finance not only bridges the gap between businesses and consumers, but also helps bridge the gap on a B2B basis. Many fintech companies are dedicated to facilitating payments and loans between buyers and suppliers (Sipay, <https://sipay.com>, 2025). According to a report published by Juniper Research, the embedded finance market was worth approximately \$92 billion as of April 2024, and is projected to reach \$228 billion by 2028, representing a growth rate of 148%, roughly (Güleç, 2024). The report also identified embedded insurance as a segment experiencing a surge in adoption globally. The growth rate of this segment is expected to become 125% from 2024–2028, and especially Asian Pacific governments have been promoting digital insurance for consumer and commercial use (Juniper Research, [www.juniperresearch.com](http://www.juniperresearch.com), 2025). In addition to these, according to the Open Banking and Payments Survey of PriceWaterHouseCoopers (PwC), 72% of Turkish consumers stated that they are open to receiving banking services from non-bank institutions (Gago and Cıgızoğlu, 2023). Yüksel Attorneys at Law (2023) draws attention to the issues that embedded finance activities would

intersect with (1) The Banking Law No. 5411 and the Regulation on the Operating Principles of Digital Banks and Service Model Banking, (2) The Law on Payment and Securities Reconciliation Systems, Payment Services and Electronic Money Institutions and secondary regulations, (3) The Financial Leasing, Factoring, Financing and Savings Financing Companies Law and secondary regulations, (4) The Insurance Law and secondary regulations, (5) The Capital Markets Law and secondary regulations (Yüksel Attorneys at Law, 2023).

Embedded finance also deserves to be assessed from another angle—economic freedom. According to the findings of a research where annual data of the large insured US commercial banks from 2003–2019 were used; economic freedom adversely impacts banks' risks, which leads to an increase in the stability of the banking system. Fierce competition forces banks to innovate products. However, deregulations regarding investment and trade cause the banking sector to be more fragile (Abbas et al., 2022: 24). Bank collapses, fraud cases and scandals are not bad scenarios left in the distant past of the financial community. Therefore, banking is and will always be a sector that must continuously be monitored. Therefore, embedded finance also brings challenges to regulatory bodies, auditors, and banks themselves. Buenfil and Romanowski point to embedded regulation in their research, which focuses on decentralized finance. Decentralized finance is defined as the application of Blockchain technology to financial services, so that financial services do not need to rely on centralized intermediaries, like banks, brokers or governments, and can be provided directly C2C (Buenfil and Romanowski, 2023: 130). Awrey and Macey (2022) discuss data aggregators, which are the pipes through which the majority of valuable data flows. This also draws attention to monitoring and regulations of the markets. With the help of more than 900 lobbying letters related to legislation on financial markets' regulation, Chalmers and Young (2020) mapped out a socialization network, which models connections between financial industry firms and their peripherals. The authors found that the divergence in terms of preferences of (1) those connected through common associational ties, (2) those closer to one another in the network, and (3) those more embedded in this network is less likely. An inference can be drawn from these results: regulations for

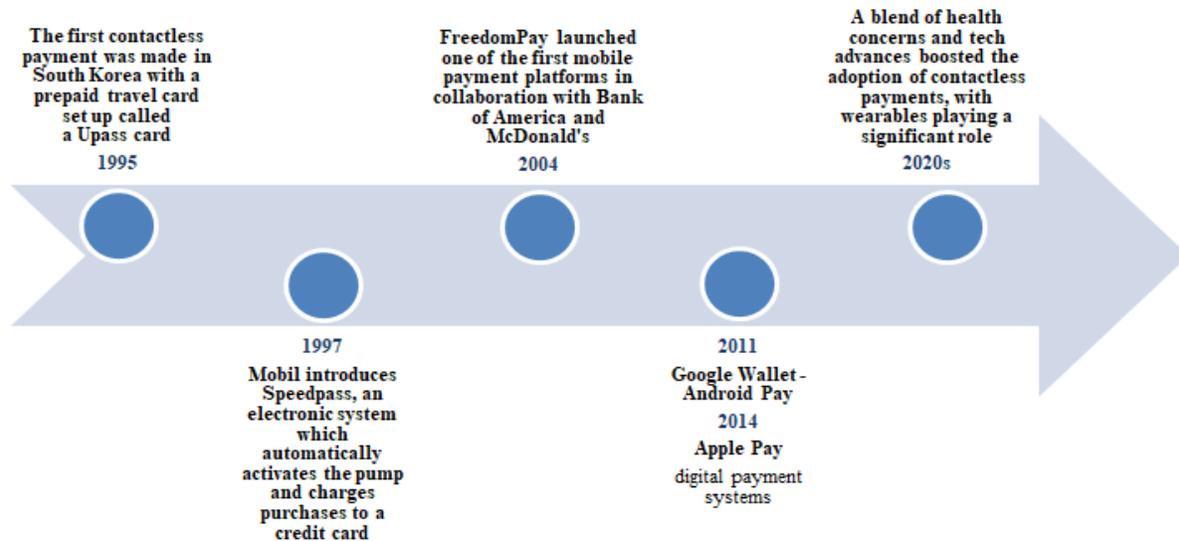
embedded finance markets will most probably be shaped by unavoidable and indispensable networks established by embedded finance structure and infrastructure firms.

The amount of data produced each day is approximately 2.5 quintillion (18 zeros bytes). As Kiourtis et al. state, business leaders are enabled to make well-informed decisions when they have access to real time insights. According to them 33% of global card spending occurs online. Financial services are received through digital platforms; third party fintech players access consumers' financial information and carry out transactions on their behalf. The EU funded FAME Project team of Kiourtis et al. introduce Federated Marketplace (FAME) the main goal of which is to develop, integrate, validate, and offer as a publicly accessible federated, decentralized, trusted and energy efficient data assets marketplace for embedded finance (Kiourtis et al., 2023: 533, 534, 539).

Now since embedded finance is described thoroughly, following the literature review the research will progress in two ways. The first one is determination of the current situation for the Turkish context, and the second one is the bibliographic analysis of published works, basically on Web of Science (WoS). The paper will flow with embedded finance examples from Türkiye.

### **3. LITERATURE REVIEW**

Contactless payments could be the forerunner of embedded finance. What is surprising is the acceleration of developments in this area. According to Uddin (2023), contactless payments began with Radio Frequency Identification (RFID) technology in the 1990s. The first contactless payment was made in South Korea in 1995 with a prepaid travel card. FreedomPay launching one of the first mobile payment platforms in collaboration with Bank of America United States, McDonald's laid the groundwork for future mobile payments. Uddin says that this started the trend of collaboration between financial institutions and merchants.



**Figure 5. Timeline of contactless payments**

Source: Organized based on the information on: (1) Uddin, N. (2023), (2) Raghavan, K. (2024), FreedomPay (<https://corporate.freedompay.com>, 06.03.2025), Exxon Mobil (<https://corporate.exxonmobil.com>, 06.03.2025)

As Trütsch puts forth in his research, which uses data drawn from Federal Reserve Bank of Boston, that only around 0.1% of all credit and debit card payments in the USA were made contactless in 2009–2012 (2020: 4). Figure 5 displays the timeline of contactless payments. According to Varadarajan et al. (2024) digital payments have become commonplace across regions and categories. They discuss the digital payments adoption by category, which are (1) Buying things and/or paying for services via a website or browser on a computer, phone, or tablet (Online), (2) Buying things and/or paying for services via an app on a phone or using an app to order ahead at retail location (In app), (3) Using a device to pay at retail locations by tapping phone on a point of sale (POS) or scanning a barcode on device (In store). Respondents' online payments in 2024 were 69% in the USA and 64% in Europe (Belgium, France, Germany, Italy, Netherlands, Spain, Sweden, and United Kingdom). Respondents in app payments in 2024 were 60% in the USA and 48% in Europe, and in store payments were 28% in the USA and 28% in Europe.

The distributions of the types of digital wallets used *In store* are as follows: (1) OEM (Payment solutions from manufacturers of smartphone devices or operating system (95% USA, 69% Europe), (2) Global wallets (Digital wallets that have a presence across multiple geographies, e.g. PayPal, Revolut, etc.) 51% USA, 33% Europe, (3) Retailer apps; 48% USA, (4) Local wallets, 23% USA, 49% Europe, (5) BNPL <1 USA, 6% Europe, (6) Other, 10% Europe.

The distributions of the types of digital wallets used *Online* are as follows: (1) OEM (42% USA, 27% Europe), (2) Global wallets (89% USA, 55% Europe), (3) Local wallets (14% USA, 34% Europe), (4) BNPL (29% USA, 26% Europe), (5) Other (<1 USA, 24% Europe).

The distributions of the types of digital wallets used *In-app* are as follows: (1) OEM (46% USA, 28% Europe), (2) Global wallets (79% USA, 46% Europe), (3) Local wallets (13% USA, 30% Europe), (4) BNPL (24% USA, 21% Europe), (5) Other (<1 USA, 19% Europe) (Varadarajan et al., 2024). Here OEM stands for Original Equipment Manufacturer.

During the earlier phases of new finance era, ‘Open Banking’ and ‘Open Finance’ were fresh terms used often. In their working paper about open finance, Awrey and Macey say that competition between incumbent financial institutions and new-generation fintech giants will lead to a fundamental restructuring of the financial services industry. According to them, consumers will be given more and better options to make faster payments, borrow money, invest their savings, manage their household budgets and compare financial products and services (Awrey and Macey, 2022: 1). Al-Omouh and Alsmadi investigate the potential impacts of fintech innovation on competitive agility and financial inclusion through data collected from 283 participants in Jordan. According to them competitive agility enables agile decision-making and execution, improves responsiveness to changes in market conditions and customer preferences, explores opportunities and anticipates competitive threats. They found that fintech innovation has a significant role in competitive agility and it also improves financial inclusion (Al-Omouh and Alsmadi, 2024: 21). Having an agile workforce and making this competence sustainable are the most important factors that will bring competitive advantage (Kumkale, 2022: 43). As observed by many circles things became more ambiguous in the world, which caused things to be more complicated. Uncertainty added on top of these made the world, especially the business world,

highly volatile. A few samples that have adversely affected the world economy and deserved agility are briefly summarized and listed below:

- 2002–2004 SARS outbreak caused by the Severe Acute Respiratory Syndrome (SARS) caused by the virus SARS-CoV-1 (Cherry and Krogstad, 2004).
- 2019–2023 COVID-19 Pandemic, also known as SARS-2, caused by the coronavirus SARS-CoV-2 (WHO, 2025a). There has been fundamental shift regarding customer behavior, amplified by the pandemic (Pratz et al., 2022).
- 7,102,195 world cumulative deaths out of 778,653,604 cases; 101,419 deaths out of 17,004,723 cases in Türkiye (WHO, 2025b).
- 2022–Ongoing Russo-Ukrainian War—actually began in February 2014.
- US ban on imported Russian oil and skyrocketing oil and gasoline prices (Cathy and Daly, 2022); 27-member EU bloc imposed a ban on the purchase, import or transfer of seaborne crude oil and petroleum products from Russia (Meredith, 2023); according to Ukrainian officials their GDP plunged 28.8% in 2022 (Dysa and Balmforth, 2024); European Bank for Reconstruction and Development (EBRD) describes the effects of the war as the greatest supply shock since at least the early 1970s (Porter, 2022); there was a 6.6% drop in Ukraine’s output in 2014, the year that Russia annexed the Crimea region of Ukraine (Shalal et al., 2022).
- With the help of Black Sea Grain Initiative, the Black Sea Grain Corridor Agreement was signed in Istanbul in July 2022 to overcome the escalating food crisis due to the war. At the end of October the total number of ships, leaving Ukraine has reached 400. The total amount of grain transported between August 1, 2022, and June 20, 2023, was 32 million tons. While 3,659,000 tons arrived at Turkish ports, the largest amount of cargo went to China, with 7,662,808 tons (www.mit.gov.tr, 2025).

On 6 February 2023, two major earthquakes struck southern Türkiye (the first with a magnitude of Mw 7.7 centered in Pazarcık and the second with Mw 7.6 centered in Elbistan), severely affecting the provinces of Kahramanmaraş, Hatay, Gaziantep, Malatya, Diyarbakır,

Kilis, Şanlıurfa, Adıyaman, Osmaniye, Adana, Elazığ, Bingöl, Kayseri, Mardin, Tunceli, Niğde, and Batman. According to the Disaster and Emergency Management Authority (AFAD, 2023), 50,783 people lost their lives, 115,353 were injured, and 37,984 buildings collapsed.

The economic and financial impacts of such major events are another topic of research. These are cited to highlight the need for agility. Agile Business Consortium uses the expression VUCA world (Volatility, Uncertainty, Complexity and Ambiguity). According to the Consortium an agile organization exploits the competence of its people to (1) Take advantage of the new opportunities at speed, (2) Adapt quickly to market changes and challenges, (3) Innovate constantly to deliver better outcomes, (4) Lead with purpose and positive intent (www.agilebusiness.org, 2025). Embedded finance can also be assessed within this approach. Names and brand names mentioned in the *Embedded Finance Examples from Türkiye* section deserve to be described as agile organizations.

Another aspect of embedded finance and technological developments and innovations surrounding it is the impact of all these on local, regional, national, international, and global development, growth, and innovative capacity. Yang et al. use a sample of prefectural and above Chinese cities from 2015–2018. They found that consumers' digital engagement (1) can improve regional innovation capacity, (2) benefits innovation output, entrepreneurial activity, and financial access, thus driving regional knowledge development and commercialization, (3) can offset the geographical concentration and innovation. They conclude that conveying knowledge intrinsic to consumer online behavior is crucial for promoting innovative capability in the relatively disadvantaged areas (Yang et al., 2024: 12).

Even though the Turkish literature about embedded finance is not deep, there are some samples. The aim of Keskin's (2025) research is to raise awareness among market participants and users about practical implications regarding new-generation financial services and embedded finance, and to evaluate Türkiye's potential in this regard. Çalışkan's (2025) research analyzes embedded finance literature using a bibliometric methodology to evaluate trends, knowledge gaps, and collaboration networks by examining 781 articles using Embedded Finance as the

keyword. Neither Keskin, nor Çalışkan outlines the Turkish context. This article differs from the reviewed literature in that it provides detailed descriptions, demonstrates the international connections of the practices of leading Turkish firms, and demonstrates how the embedded finance market has developed in Türkiye.

#### 4. EMBEDDED FINANCE EXAMPLES FROM TÜRKİYE

Under this heading, some of the embedded finance examples from Türkiye will be listed. They are not necessarily Turkish origin. Ödero, Finacell, Easycep, Booking, Koç Fiat Kredi, Teknosa, MediaMarkt, Hepsiburada, n11, Trendyol, and Kredim are examples from Türkiye. The criteria for choosing these companies are ease of access and nationwide recognition. With the help of the information collected from the web sites of the above listed brands, Turkish frame of embedded finance will be drawn.

**Table 1.** Brands and Their Embedded Finance Applications

<b>Tourism Sector</b>
<b>Booking.com</b> incorporated under the laws of the Netherlands provides services for booking accommodations, attractions, car rentals, flights, private and public transport and enables customers to compare alternatives. Due to regulations, customers in Türkiye are allowed only to book for international properties and the like. Prices are shown according to the customers' choices. Payments can be done with the local currency or with foreign currencies. If chosen, Booking.com enables the customer to make payment in home currency, while it ensures the service provider payment in its local currency. Fees and charges for this facility are either included in the exchange rate or appear as a separate line item (Booking.com, 29.1.2025). Since FX and payments are covered by embedded finance, Booking.com becomes a part of this table.
<b>e-Commerce Sector</b>
<b>Hepsiburada</b> as a platform, where many sellers, importers, producers and Hepsiburada itself sell goods and services, offers a wide range of payment facilities. Fast Loan, Hepsiburada Limit, and Hepsifinans Loan are embedded finance samples, having been used by Hepsiburada since long. Applications are digitally done by selecting Shopping Credit on the Hepsiburada payment page, and completed—no need to go to a bank branch to apply for a loan. In case there are documents the client is asked to sign at the bank as a new bank client, they are delivered to the client's address or signed electronically. There is no life insurance or file fee in the use of shopping credit. Credit usage conditions and credit evaluations are made by the relevant banks, and Hepsiburada has no influence. All transactions related to the credit, including the payment of credit installments, are made through the bank from which the loan is used. In the event that the client cancels or returns his/her order, the relevant amount is automatically sent to his/her current account associated with the loan at the bank from which the client uses the loan. The loan will not be closed automatically, the client contacts the bank via the Branch or Call Center to close it, or if the bank provides a credit closing service via mobile/internet banking, it can be closed digitally. Fibabanka, ING, Akbank, DenizBank, Garanti BBVA, YapıKredi, On Dijital Bankacılık, TEB, and NKolay are financial service providers (Hepsiburada, www.hepsiburada.com, 2025).
<b>n11</b> is one of the online shopping sites in Türkiye. Payments for purchases from n11 can be done with a credit card, bank card, virtual card, bank transfer, BKM Express, Masterpass, GarantiPay, Paycell, MasterPass, Instant Digital Credit or Installment Additional Account, Fibabanka Shopping Credit, Yapı Kredi Shopping Credit, İş Bankası Instant Shopping Credit, İş Bankası Installment Additional Account, Garanti Shopping Credit or Akbank Direct Payment. Credit usage conditions and credit evaluations may vary by bank. Like the other online shopping brands, n11 has no effect on the evaluation of credit applications or the allocation of credit either (n11, https://www.n11.com, 2025).

<p><b>Automotive Sector</b></p> <p><b>Koç Fiat Kredi</b> is a distributor-dependent (captive) financing company. It provides credit services for all Fiat, Alfa Romeo Jeep and Iveco brands and used vehicles manufactured in Türkiye under the Fiat Auto license and/or imported to Türkiye, including direct sales of Tofaş Türk Otomobil Fabrikası. Koç Fiat Kredi provides financing with easier, faster and more flexible credit terms to customers who want to buy a Tofaş or Iveco model vehicle from authorized Tofaş and Iveco dealers. Equal payment, single payment, increasing or decreasing payment, interim payment, installment deferred loan, installment skipping loan, single payment loan, fully flexible loan, periodically variable payment loan, balloon payment, and farmer credits are options offered to customers for different vehicles. Wide dealer network located all over Türkiye enables easy access to Koç Fiat Credit. All transactions from vehicle selection to credit transactions are done at the single sales point (Koç Fiat, kocfiatkredi.com.tr, 28.01.2025).</p>
<p><b>Finance</b></p> <p><b>Ödero</b> is the brand of Token Financial Technologies, one of Türkiye's payment system platform providers, specializing in online payment systems and offering financial technologies. With the assurance of Koç Holding and the power of Token Financial Technologies in the field of payment systems, the company develops online payment solutions that claim to meet the needs of businesses and provide profitable and efficient business management. (1) <i>Installment Sales to All Customers</i> The client can make installment sales to all customers who do not have a credit card, do not want to use their card, or do not have sufficient credit limits; (2) <i>More Installment Opportunities</i> Ödero Shopping Credit offers special campaigns through contracted banks, so that their clients can offer their customers longer term options; (3) <i>Time and Cost Savings</i> The ability to easily integrate into bank systems and instant credit approval opportunities, the client can save time and cost; (4) <i>Increased Customer Satisfaction</i> Ödero Shopping Credit claims to enable its customers to increase customer satisfaction by offering their customers an alternative payment method to shop without worrying about trust (Ödero, oderopay.com.tr, 28.01.2025).</p> <p><b>Kredim.</b> Founded in 2018 as Türkiye's first digital finance company, TURK Finansman A.Ş. is under the umbrella of Param Group, which offers end-to-end financial technology solutions for corporate and individual customers. TURK Finansman A.Ş. serves as an important part of Param Group's integrated finance network. Param, Kredim, Finrota, ParamTech, Univera, Univis, Twisto and ParamUK brands constitute Param Group's payment, collection and finance product ecosystem. Various financial solutions such as electronic money, prepaid cards, physical, virtual and soft POS systems, e-wallet, issuing, acquiring, processing, BNPL, online collection, and open banking compose its product portfolio. TURK Finansman A.Ş., which received an activity certificate from the Banking Regulation and Supervision of Agency (BRSA) in 2019, started to provide financing for individual and commercial loans. In 2021, by establishing Kredim, it brought the "Buy Now, Pay Later" model to Turkey. Kredim is a digital shopping loan that offers flexible payment options to individual and corporate users. With the aim of making credit shopping fast, easy, accessible to everyone and with different repayment options (Kredim, www.kredim.com.tr, 2025). As far as seen from the explanations on its web site, Kredim is one of the implementers of embedded finance.</p>
<p><b>EasyCep,</b> which set out in 2018 with the vision of making Turkish consumers love refurbished electronic devices, is a refurbished electronic product market with products ranging from mobile phones to tablets, smart watches, computers and robot vacuum cleaners, and an operational network that spread all over Turkey. Fibabanka shopping loan is an advantageous personal loan type offered by the EasyCep &amp; Fibabanka cooperation to meet the shopping needs made via EasyCep. While shopping from EasyCep (1) Shopping Credit is selected from the payment options to complete the shopping; (2) during Shopping Credit Inquiry phase Fibabanka is selected for individual shopping credit application. The credit evaluation and allocation process belongs to Fibabanka A.Ş.; (3) the client of EasyCep compares the rates and selects the desired maturity. The specified individual shopping credit interest rates are determined by Fibabanka A.Ş. and may vary according to bank criteria; (4) When the "Apply for Credit" button is clicked, it is directed to Fibabanka A.Ş individual shopping credit application screens. As soon as the application steps are completed by Fibabanka A.Ş., the order is successfully created (EasyCep, easycep.com, 2025).</p>
<p><b>Zip.</b> Zip Finansman A.Ş., as a BRSA licensed consumer finance company, has set out to finance the purchase of the products and services its customers want whenever they need them. A wide range of products through its business partners in various sectors is offered to its customers. Zip's claim is to provide its customers with easier access to their needs and to offer flexible and customizable payment options that fit their budgets. With financial inclusion, Zip promises easier sales and growth to its clients' business partners all around the country with the opportunity to reach more customers and effective payment options (Zip, <a href="https://tr.zip.co/">https://tr.zip.co/</a>, 28.01.2025).</p>
<p><b>Electronics</b></p> <p><b>Financell</b> defines itself as the meeting point of technology and finance. As a platform, technology and credit meet at Financell. Under the brand name Financell, Turkcell Finansman A.Ş. was launched in 2016 by Turkcell. Financell offers financing support to its customers in many areas with Green Energy Credit, Second Hand Vehicle Credit, Shopping Credit and Technological Product Credit offered on Turkcell channels. Reliable, transparent and fast financing solutions are the commitments of the brand. They aim to be a pioneer and leader in the society's transition to a cashless life by offering a unique fintech experience that every individual can easily access. With their innovative solutions, they aim to make the opportunities brought by digitalization</p>

accessible to everyone by bringing financial services to all. The company's mission is to facilitate its customers' access to financial services in their digital transformation journey and to offer them the best experience in this process. With the help of technology, the company aims to meet the financial needs of its users quickly, reliably and effectively and add value to them. Personalized financial services are the key in its solutions. Online spots, where Financell can be used are Turkcell Pasaj, Trendyol, DeFacto, and ETS Tur (Financell, <https://financell.com.tr/>, 28.1.2025).

**Teknosa** is a platform in Türkiye, where several importers, producers, and sellers take place and market their goods. Teknosa is truly offering Consumer Loan alternatives at the moment of sale. Its financial service providers are enpara.com, QNB, Akbank, Garanti BBVA, Türkiye İş Bankası, DenizBank, On Dijital Bankacılık, TEB, ING, alBaraka, and getirfinans. Installment cash advance is the other choice. Teknosa only provides guidance services regarding credit transactions (Teknosa, [www.teknosa.com](http://www.teknosa.com), 2025).

**MediaMarkt** is another platform in Türkiye, where several categories of goods are carried. MediaMarkt not only provides Shopping Credit via Garanti BBVA, but also offers insurance product its customers and provides coverage for accidental damages and theft situations included in the policy, which are included in the insurance coverage in many cases where the manufacturer's warranty of the electronic device purchased is not valid. All coverages related to the insurance product offered within the Device Protection Insurance are provided by BNP Paribas Cardif Sigorta A.Ş. (MediaMarkt, [www.mediamarkt.com.tr](http://www.mediamarkt.com.tr), 2025).

**Source:** Organized based on the information accessed via websites of brands.

The above listed and presented brands and their embedded finance applications are only a bunch examples of embedded finance in Türkiye; there are others operating in the market. However, the rich variety of embedded finance providers and their business partners show the deepness and readiness of Turkish finance market for embedded finance. When this is the case, it becomes very natural that academics are interested in the topic. The following section will try to find out who, from which country, and how do research on embedded finance and related topics.

## 5. WOS BIBLIOGRAPHIC ANALYSIS

This section aims trying to find out who, from which country, and how to do research on embedded finance and related topics; so that new research areas could be determined. The bibliographic analysis of published works basically on Web of Science (WoS) follows. The criteria for choosing the keywords used in WoS search is that in the preliminary research conducted, these words are mentioned in definitions of each other.

### 5.1. Data and Analysis

The search on 19.01.2025 yielded four results from WoS Core Collection for the topic “embedded finance” and 16 from Scopus, where all four WoS articles are also listed at Scopus. From oldest (2008) to newest (2024) by year from ten different disciplines; six books, five journal articles, four conference proceedings, and one book series are found.



**Chart 1.** The Treemap Chart Categories of the Published Works—produced by WoS on 20.01.2025

**Source:** WoS, (20.01.2025)

[https://a8f59890210bb2a36cc265c34c80a801c14e01d5.vetisonline.com/wos/woscc/analyze-results/edd309ce-9729-4a5e-9f17-9f09e4cf81fe-0144dd589e,](https://a8f59890210bb2a36cc265c34c80a801c14e01d5.vetisonline.com/wos/woscc/analyze-results/edd309ce-9729-4a5e-9f17-9f09e4cf81fe-0144dd589e)

On the other hand, the search with one of the terms (1) embedded finance, (2) finance technology, (3) fintech, (4) incumbent finance yielded 6,664 results. All Vos Viewer analyses are based on very initial data. Next day it turned to 6,670. Charts produced by WoS are also utilized. The Treemap Chart produced by WoS displays WoS Categories of the published works. As expected 3,495 of these works are in business finance, economics, and engineering, electrical, electronic areas. Chart 3 and Chart 2 show the distribution of published work on yearly basis. As seen from the Chart 3, 2018–2024 is the most productive era. Even though the x-axis starts from 1993, the first publication was in 1982. Until 1993, there are 10 publications in this area.

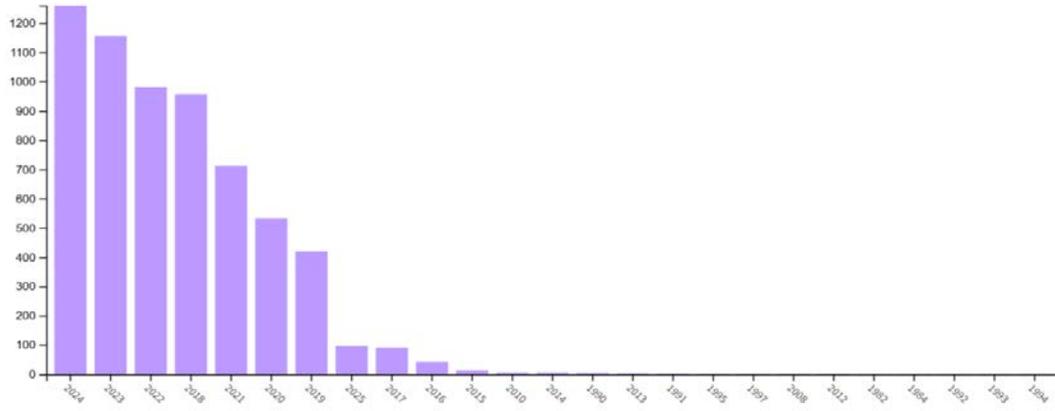


Chart 2. The Bar Chart Years of Publications Results Count—produced by WoS on 20.01.2025

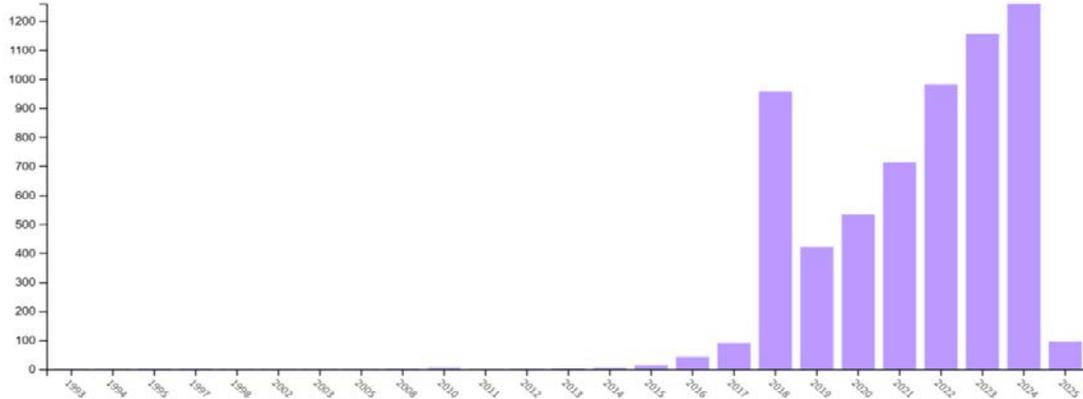


Chart 3. The Bar Chart Years of Publications Date—produced by WoS on 20.01.2025

Source: WoS, 20.01.2025

<https://a8f59890210bb2a36cc265c34c80a801c14e01d5.vetisonline.com/wos/woscc/analyze-results/23f8e8c3-22ef-4c82-bd37-c41607390fbc-0144deada3>

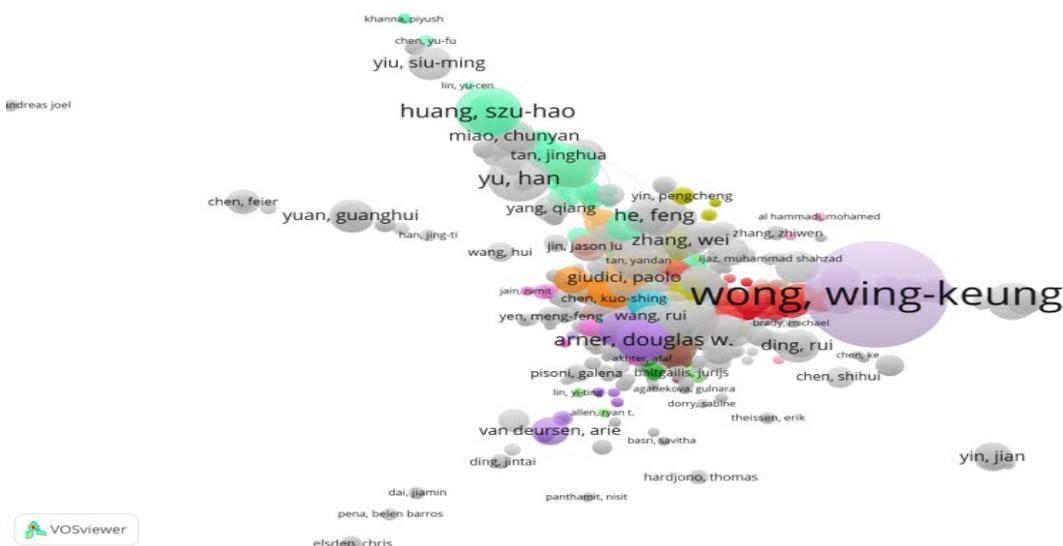
<https://a8f59890210bb2a36cc265c34c80a801c14e01d5.vetisonline.com/wos/woscc/analyze-results/edd309ce-9729-4a5e-9f17-9f09e4cf81fe-0144dd589e>

Out of these, 4,840 are articles, 1,465 are proceedings papers, 298 are books and/or book chapters, and 204 are review articles. Web of Science Index distribution is as following: Social Sciences Citation Index (SSCI) lists 2,531 of them; Emerging Sources Citation Index (ESCI) lists 1,494, Science Citation Index Expanded (SCI-EXPANDED) lists 1,434, Conference Proceedings Citation Index – Science (CPCI-S) and Social Science & Humanities (CPCI-SSH) together list 1,529 publications.



### 5.3. Analysis of Citation of Authors

In order to identify citation networks, a network map was created for author citation analysis with the criteria of at least one publication and at least one citation. In the analysis conducted on 7,831 units that were found to be connected to each other, a total of 66 clusters, 178,981 connections and a total connection strength of 204,625 were identified. The most cited author given above also has the strongest total length strength—2,847. Yong Jae Shin follows with 1,161, and Robert J. Kauffman with 1,148 respectively. Figure 7 displays these links. Of the 16,662 authors, 11,329 meet the threshold, however, some of the items in the network are not connected to each other; therefore, only connected items are shown in the analysis.



**Figure 7. Authors' Citation Links**

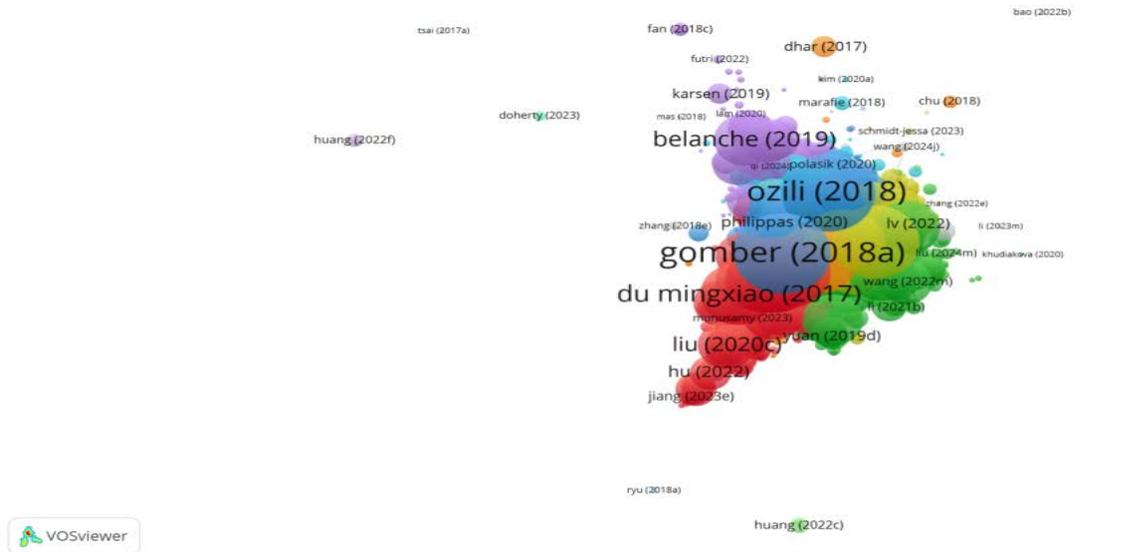
Source: Authors own

### 5.4. Citation of Countries Analysis

In order to create a network map regarding the citations received by the publications according to their country of origin, an analysis was conducted on units that are related to each other within the scope of the criterion of at least one work being published and one citation being received by a country.



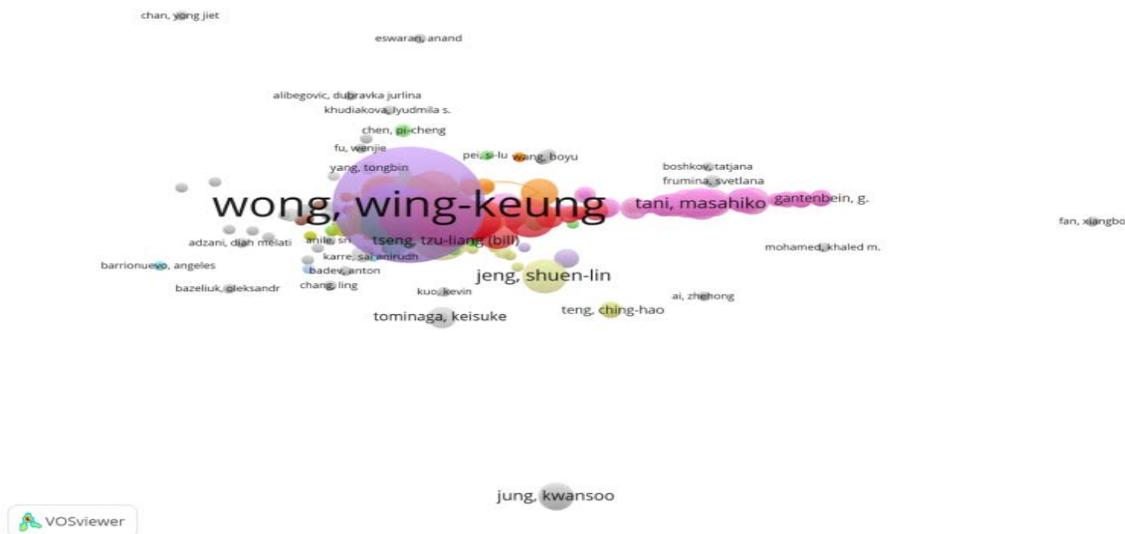




**Figure 10.** Bibliographic Coupling of Documents  
 Source: Authors own

### 5.7. Bibliographic Coupling of Authors

According to the analysis performed with 11,329 units selected with the criterion of having at least 1 published work and 1 citation and having connections among them, 66 clusters, 5,115,876 connections and 13,237,011 total link strength were obtained.



**Figure 11.** Bibliographic Coupling of Authors  
 Source: Authors own



The research encompasses the collection, analysis, and mapping bibliographic information derived from WoS by using VOS Viewer. One of the limitations of such an analysis is the misleading character of the keywords chosen by the researchers. It is observed that publications of some of the most popular authors and/or most cited works use the keywords that are searched for in a different context. Nonetheless, the maps created help finding out the most neglected areas of research. Besides, there is not enough study regarding the Turkish context. The preferences of Turkish academics building their oeuvre in their native language may be the cause of this outlook. Exclusion of publications from Turkish portals might have made it appear biased, too. This pioneering research can take the lead role.

## **6. FINDINGS & CONCLUSIONS**

This study explored embedded finance in Türkiye. In the study, the infrastructure of embedded finance is discussed first. Then, the current situation for the Turkish context is determined. The data and information on the web sites of the most reliable and popular digital shopping industry members in Türkiye were helpful in determining the way they benefit from embedded finance. With the hope to ignite future research, the bibliographic analysis of published works basically on Web of Science (WoS) are displayed. In the light of the data collected, it is seen that there are very satisfactory embedded finance examples and consumers embrace embedded finance applications. In addition, there is plenty of room for new embedded finance applications in Türkiye; the market is not saturated yet. The motto should be identifying the growth opportunities, enriching the talent possessed, managing the change and transforming to lead embedded finance. The readiness of Turkish consumers to embedded finance is a valuable, and may serve as an opportunity. It can be argued that the actual situation is brought with the accelerating use of smartphones and internet. Besides, it can also be put forth that Generation Z is dominantly shopping and they are more internet literate, etc. These are hypotheses to be tested with the help of empirical data in the future. As a rhetorical question, it is also to be asked why academics in Türkiye did not pioneer embedded finance. As of Oct 2025, there are only two articles on the Dergipark platform, which are published very recently, and the authors of which are from Türkiye. The third one is “Islamic Embedded Options in Structured

Products of Malaysia: Issues and Challenges” (2020), the authors of which are Malaysian. Out of 4,767 papers published on library databases there is only the above-mentioned Turkish paper written by Malaysians mentioning embedded finance. Therefore, this study pioneers in exhibiting the current situation in Türkiye, and leads the way for research in embedded finance topic.

Since the main purpose of this study is to reveal the status of embedded finance applications in Türkiye; regulatory framework and accounting applications are left for later research. In the future, it is planned to analyze the Turkish regulatory frameworks in depth and to cover the accounting and reporting side in detail in the light of regulatory and technological developments.

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