Grzegorz Paluszak*
Joanna Wiśniewska-Paluszak**

THE ROLE OF GREEN BANKING IN A SUSTAINABLE INDUSTRIAL NETWORK

INTRODUCTION

In the 21st century, modern finance overlaps more and more with other economic disciplines, as well as other science disciplines. Over time, it becomes more and more problematic to set constant limitations between them. S. Flejterski has written on the limitations problem in comparative finance. This is used to determine the limits of transferability[1]. Additionally, however, this problem is interconnected with the interdisciplinary approach in finance and economic science. For example, G. Borys makes an attempt to research finance from the viewpoint of the sustainability development paradigm[2]. It is worth mentioning that E. Kulińska-Sadłocha and J. Szambelańczyk regarded, *inter alia*: sustainable development, corporate social

* Grzegorz Paluszak, Ph.D., Adjunct at the Department of Banking, Finance and Accounting, University of Warsaw.

** Joanna Wiśniewska-Paluszak, Ph.D., Adjunct at the Department of Economics, Poznan University of Life Sciences. The research has been possible to conduct thanks to the financial support of the National Science Centre Poland contracted under decision number DEC-2013/09/B/HS4/01494.

1 S. Flejterski, *Ekonomia, finanse i zarządzanie w perspektywie metodologicznej i interdyscyplinarnej*, [in:] B. Fiedor (Ed.), *Nauki ekonomiczne. Stylizowane fakty a wyzwania współczesności*. Polskie Towarzystwo Ekonomiczne, Warszawa 2015.

2 G. Borys, *W kierunku finansów zrównoważonego rozwoju*, [in:] (Ed.) T. Famulska, *Szkice o finansach. Księga jubileuszowa prof. zw. dr hab. Krystyny Znanieckiej*, Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach, Katowice 2012, p. 43.

responsibility (CSR) and socially responsible investment (SRI) as concepts for diminishing the adverse effects of differentiation processes, in particular degradation and polarisation in the economy. They can therefore be considered as having positive influence on the economy, society and the environment[3].

L. Dziawgo sees SRI and CSR as interdisciplinary concepts. Although the SRI concept concerns capital investment and the CSR concept pertains to business undertakings, both concepts are interrelated, because they take into account the ethical, social and ecological aspects in relationships with shareholders[4]. Similarly, D. Dziawgo addresses the SRI concept. According to the SRI concept, financial assessment of business activities requires taking non-financial criteria into consideration[5]. Additionally, L. Dziawgo positively appraises CSR as an uncontested standard for business activities in the financial sector, because it improves the social quality of the economic and financing process. One of the key aspects of CSR is environmental protection. It's a more and more commonly accepted concept and is also actively supported by society. In these circumstances, we are witnessing a pro-ecological evolution of the modern economy and finance[6]. Scientists emphasise the necessity of the CSR concept not only in the area of finance research, but also in banks' practice. It should take into account this finance research area, because so far the available research results reveal the incoherence of the credit institutions' declarations with their implementations[7]. In this modern banking activities' context, the CSR concept is connected with the SRI concept, because the non-financial criteria for both concepts include environmental, social and ethical criteria.

The overlapping complex problems in research areas: sustainable development, CSR, SRI and finance, constitute green finance. In S. Flejterski's opinion, green

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3 E. Kulińska-Sadłocha, J. Szambelańczyk, *Lokalne instytucje kredytowe w koncepcji zrównoważonego rozwoju Polski*, [in:] (Ed.) K. Pietraszkiewicz, *Sektor finansowy. Stymulatory i zagrożenia rozwoju*, Polskie Towarzystwo Ekonomiczne, Warszawa 2015, p. 241.

4 L. Dziawgo, *Zielony rynek finansowy. Ekologiczna ewolucja rynku finansowego*, Polskie Wydawnictwo Ekonomiczne S.A., Warszawa 2010, p. 15–16.

5 D. Dziawgo, *Transparentność i zaufanie jako wyzwania dla rynku finansowego i gospodarki XXI wieku*, [in:] (Eds.) B. Kołosowskiej, P. Prewysz-Kwinto, *W świecie finansów i prawa finansowego. Działalność dydaktyczna Profesora Jana Głuchowskiego.* Wyższa Szkoła Bankowa w Toruniu, Toruń 2010, p. 220.

6 L. Dziawgo, *Produkty finansowe a ochrona środowiska. Proekologiczna ewolucja współczesnego rynku finansowego*, [in:] (Eds.) B. Kołosowskiej, P. Prewysz-Kwinto, *W świecie finansów i prawa finansowego. Działalność dydaktyczna Profesora Jana Głuchowskiego*, Wyższa Szkoła Bankowa w Toruniu, Toruń 2010, p. 257.

7 For example: J. Szambelańczyk, *Finanse wobec problemów teorii i praktyki bankowości w Polsce*, [in:] (Eds.) J. Czekaj, S. Owsiak, *Finanse w rozwoju gospodarczym i społecznym*. Polskie Wydawnictwo Ekonomiczne S.A., Warszawa 2014, p. 125; M. Marcinkowska, *Ocena banku w kontekście relacji z interesariuszami*, t. 3, Wydawnictwo Uniwersytetu Łódzkiego, Łódź 2013 and M. Marcinkowska, *Corporate Governance w bankach. Teoria i praktyka*, Wydawnictwo Uniwersytetu Łódzkiego, Łódź 2014.

finance is one of the new finance sub-discipline[8]. Because of green finance's complexity, in this article we focus on a narrower part – green banking combining business, society and ecology.

The paper is based on the critical interpreting and modifying of economic approach and concept of industrial network to hypothesise and theorise on the role of green banking in the sustainable development of industry. It serves for conceptualisation of a green banking sustainable industrial network using a modified model of business interactions with stakeholders in which the industrial network is being considered as the main reason for connecting individuals, resources and activities for creating new industrial ecosystems based around the main financier, i.e. the green bank supporting the creation of a new industrial ecosystem as a sustainable industrial network.

The paper is organised as follows. In the first part of the paper the research background has been presented, i.e. insight into the concepts, theories and methods applied within the areas of industrial networks. In this part of the paper the genesis, system and structural orientations, paradigms and ideas, methods and practices of the network approach is discussed. The second part of the paper presents the concepts, aims and activities of green banking. It starts with a presentation of the concept of green banking, its definition, aims and activities. It comprises a discussion on the activities of the green banking community in Poland. The paper closes with a conceptual analysis of the green bank as a participant in a sustainable industrial network. Its role is understood as a motivator and initiator of an ecologically and socially responsible industrial network.

1. BACKGROUND AND METHODOLOGY

The descriptive literature review for discussing the research background has been used. Subsequent theoretical conceptualisation has been proposed for envisioning a network of green banking as an example of a sustainable industrial network. An industrial network is one of the approaches developed since early 70's by the Industrial Marketing and Purchasing Group (the IMP Group). This approach's authors assume that no business is an island[9]. The main subject of business, therefore, is the relationship with buyers, suppliers and other companies'

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8 S. Flejterski, *Współczesna nauka finansów w systemie nauk ekonomicznych*, [in:] (Ed.) S. Rudolf, *Sektor finansowy – dylematy i kierunki rozwoju*. Polskie Towarzystwo Ekonomiczne, Warszawa 2008, p. 358.

9 H. Håkansson, H. and I. Snehota, *No business is an island: The network concept of business strategy*, Scandinavian Journal of Management, 5(3), 1989 and H. Håkansson, H. and I. Snehota, *"No business is an island" 17 year later*, "Scandinavian Journal of Management", 22(3), 2006.

related actors. The approach assumes that the entire activity and each change in the company's activities takes place within the relationship and those relationships are a central feature of business and the organisational landscape of modern industries. The approach is concerned with the understanding of the content and shape of business relationships. This approach, known as an industrial network or just the network, exemplifies that an economic world consists of networks of business relationships. The approach has prevailed over the idea that atomistic companies are doing business in a world of anonymous suppliers and anonymous consumers. The main phenomena observable in networks are cooperation, competition, interactions, business relationships, movement, relatedness and exchange.

The main feature of business is interaction which, according to D. Ford and H. Håkansson has several key characteristics: time, interdependence, relativity, jointness, and subjective interpretation. The interaction that takes place between single actors is always the outcome of their previous interactions, as well as of their current interactions with others and their anticipation of future interactions of others. Therefore, business interaction is embedded in past, current and future time. The inherent characteristics of interacted network structures are interdependencies. In networks they are built mainly on technological, economic and resource dimensions. These interdependencies bring different kinds of organisational, social, strategic and logistical consequences as well as effects on production structure, product development and economic effectiveness. The observable phenomenon shows that efficiency of resources evolves together with exploitation of considered interdependencies by the network partners. Since interaction always takes place in relation to others, there are no simple or stable rules as well as everything is time relative. The next key characteristic of business interaction, i.e. jointness, develops in many aspects: combined intentions, specific investments, mutual commitment and the common aims of network partners. The last but not least characteristic –subjective interpretation – means that all actors have their individual interpretations of the actions of others and their interactions are based on those interpretations[10].

The interactions evolve into a temporal relationship with specific features typical for business. H. Håkansson and I. Snehota distinguished two main kinds of characteristics for a business relationship. They are: structural characteristics, as follows: continuity, complexity, symmetry and informality; and process characteristics, as follows: adaptations, cooperation and conflict, social interaction and rutinization[11]. A company's major customer and supplier relationships show

[10] D. Ford, and H. Håkansson, *The Idea of Business Interaction*, "The IMP Journal", 1(1), 2006, pp. 7–16.

[11] H. Håkansson and I. Snehota, (Ed.), *Developing Relationships in Business Networks*. Routledge, London and New York 1995, pp. 35–104.

continuity and relative stability. The long-term relationships are a precondition for change and development in the network. Business relationships are complex in many ways, e.g. number, type, contact pattern. Typical business relationships appear symmetrical in terms of resources and initiative of the parties involved. They often have a low degree of formalisation. Mutual adaptations are a prerequisite of the development and continued existence of the relationship between two companies. Elements of cooperation and conflict coexist in business relationships. Despite business relationships being essentially about business-specific behaviours – subjective values – the personal bonds and convictions that are always present play an important role in the formation of a relationship. While business relationships are often complex and informal, they tend to become institutionalised over time[12].

Regardless of the type of industry, a company always operates within a texture of interdependencies that affects its development. A few are repeatedly encountered in various business relationships, i.e.: technology, knowledge, social relations, administrative routines, systems and legal ties[13]. In networks technical development within one company and in its relationships is dependent on other companies' technologies. This is facilitated or constrained not only by those with whom the company maintains direct relationships but also by the technology of other third parties. In the same way, the know-how of the company reflects not only the knowledge of its personnel but also that of the other companies and organisations to which it is connected through business relationships. The solutions adopted in one (or several) relationship(s) will affect what is possible or necessary to do in some other relationships. The legal texture is of interest as it can connect different business units with privileged ties. This applies especially to different forms of ownership control or other forms of agreements. Social bonds that arise among individuals in the two companies are important for mutual trust and confidence in interactions between individuals.

By and large, the network is considered as a structure with a number of nodes related to each other by specific threads. Business threads are distinguished from social threads or market threads by their complex interactions, resource ties, knowledge exchange, reciprocal adaptations and common specific investments as well as unique technical and human resources. Business relationships are recognised as complex and long-term and their current form is the outcome of: previous interactions between the business units, learned knowledge about the partner and the relationship, other relationships with other partners, the expectations of future interactions and what happens in the wider network of relationships.

H. Håkansson and D. Ford underline three paradoxes that take place within the network. The first paradox is that networks create opportunities as well as

[12] *Ibidem*, pp. 9–10.
[13] *Ibidem*, pp. 12–13.

constraints for the participants; which actions should be considered as a part of the whole network activity. The second paradox is that each action influences other actions and each network partner influences others and is being influenced by others. The third paradox is about control and its effects for the network's development. This is connected with the governance and management aspects of the network. In general, network ties should be strong, well-established and cooperative, but uncontrolled. The more the one company controls the network, the less effective and innovative is the network[14].

The reciprocal relatedness in networks results in the strategy decisions undertaken by companies within the network. The network's efficiency and effectiveness are determined by the way in which activities are configured and integrated, how resources are combined and which are the positions of the actors. These network structures are affected by, and affect, the three elements of supply strategy: relating, bounding and organising. These elements mixed in numerous ways give the opportunity to choose different network strategies[15]. In the network strategy the business relationship is regarded as a resource that the company can control and which can change the position of the company in the network. The strategy analysis of business networks consists of: network picture, networking and outcomes. The first is visualisation and verbalisation of the network by a particular actor. The second is initiating, responding and maintaining the substantive networking. The third is analysing all evolving effects of interactions, *inter alia* economic, social and technical results[16].

The last, but not least, feature of the business network is that building up the activity patterns, webs of actors and resource constellations takes time. The network is a temporally evolving phenomenon; movement, change, flow and process consisting of events, activities and choices. L. Bizzi and A. Langley highlight the fact that networks among organisations are not seen as structures that change over time, but rather as dynamic inter-relationships reconstituted incessantly by ongoing activity; adapted and reproduced through space and time[17]. According to A. Halinen, Ch.J. Medlin and J.-Å. Törnroos, time and space are the central constructs by which humans grasp and comprehend change. In network analysis, they consider time as an individually and socially constructed event-time, and suggest that using the entities' event times together with clock time can notably

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14 H. Håkansson and D. Ford, *How should companies interact in business networks? "*Journal of Business Research"*,* 55(2), 2002.

15 L.-E. Gadde, H. Håkansson, G. Persson, *Supply Network Strategies*. John Wiley & Sons Ltd, West Sussex, 2010, p. 242.

16 H. Håkansson, D. Ford, L-E. Gadde, I. Snehota, and A. Waluszewski, *Business in Networks.* John Wiley & Sons Ltd, West Sussex, 2009, pp. 180–197.

17 L. Bizzi and A. Langley, *Studying processes in and around networks*, "Industrial Marketing Management", 41, 2012.

improve the understanding of processes, change and development in business networks[18].

To sum up, a business network is a specific quasi-organisation with a specific structure of interactions and interdependencies and specific economic, technical and social dimensions. Nowadays, industry networks are the main feature of business landscapes. The network approach is an evolving academic field enclosing different kinds of studies, research and analysis of business networks. Within the framing of the network approach a general model of business relationships has been developed in terms of activities, resources and actors. The model is widely used for different kinds of analyses, e.g. the positive and negative effects of strong ties on innovation, processes of network evolution, network performance effects, effective change of management practices, interplay between network structures, process of resource development and many others.

2. CONCEPTS, AIMS AND ACTIVITIES OF GREEN BANKING

The main mission of the green bank is to combine business and ecology for the benefit of customers. The approach to green banking varies from bank to bank. Generally, the term green banking refers to banking practices that foster environmentally responsible financing practices and environmentally sustainable internal processes[19]. A survey of further literature reveals several more different interpretations of green banking (Table 1). According to the Coalition for Green Capital a green bank is a state-chartered and state-capitalised lending institution designed to fill gaps in private market finance for clean energy generation and energy efficiency. A green bank is a public or quasi-public financing institution that provides low-cost, long-term financing support to clean, low-carbon projects by leveraging public funds through the use of various financial mechanisms to attract private investment so that public money supports multiple moneys from private investment[20].

Depending on the state, a green bank may conform to a variety of structures, utilise many different public funds and create a diverse array of financial products. Although a green bank may take a variety of forms, there are generally three structures to consider. First, the green bank can be standalone as a quasi-independent entity. This structure allows for the most flexibility and autonomy. Another option is for the green bank to be housed within an existing state agency.

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18 A. Halinen, Ch.J. Medlin, J.-Å. Törnroos, *Time and process in business network research*, "Industrial Marketing Management", 41, 2012.

19 S.M.M. Rahman, and S. Barua, *The Design and Adoption of Green Banking Framework for Environment Protection: Lessons from Bangladesh,* "Australian Journal of Sustainable Business and Society", 2(1), 2016, p. 2.

20 Coalition for Green Capital, *Report: Green Bank Academy*, Washington, 2014, p. 2.

Lastly, a green bank may be incorporated into an infrastructure bank, where it would likely be established as a separate subsidiary. Generally, there are three stages to establishing a new state green bank. In the first stage, a coalition of stakeholders (e.g., clean energy organisations, clean tech trade associations, environmental groups and state agencies) establishes a base of support for a green bank. This support is critical to passing legislation or achieving the required regulatory change to legally create a green bank. In the second stage, the green bank organisation is established, which includes hiring staff, building capabilities, identifying goals, assessing markets and developing products. In the final stage, the green bank actually begins acquiring customers, lending in partnership with private investors, and recycling funds in order to recapitalise the bank. A green bank is a state-chartered and state-capitalised lending institution designed to fill gaps in private market finance for clean energy generation and energy efficiency. A green bank is a public or quasi-public financing institution that provides low-cost, long-term financing support to clean, low-carbon projects by leveraging public funds through the use of various financial mechanisms to attract private investment so that public money supports multiple moneys from private investment[21].

Ultimately, all green banks will exhibit several common characteristics:

- encourage a shift from one-time subsidies and grants towards market-catalysing financial tools,
- push innovation in policy, incentive structures, financial tools and marketing,
- spur private sector growth and competition in order to give consumers energy choices,
- stimulate demand by covering one hundred per cent of the upfront costs with a mixture of public and private financing,
- leverage public funds by attracting much greater private investment to clean energy and efficiency markets,
- recycle public capital so as to expand green investment and leave taxpayers unharmed,
- reduce market inefficiencies,
- scale up clean energy solutions as fast as possible, maximising clean electricity and efficiency gains per state money[22].

The broad objective of green banks is to use resources with responsibility and give priority to interaction of the environment with society. Green banks promote social responsibility, because they consider before financing a project whether it is environment-friendly and has any future environmental implications[23]. Therefore,

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21 Coalition for Green Capital, *Report: Green Bank Academy*, Washington, 2014, p. 2.

22 *Ibidem*, p. 1.

23 S.C. Bihari, *Green Banking Towards Socially Responsible Banking in India,* "International Journal of Business Insights and Transformation", 4(1), 2011, p. 82.

green banks are gradually coming to realise that there is need for a shift from the "profit, profit and profit" motive to "planet, people and profit" which in fact establishes the rationale for green banking[24]. Green banking is a concept of shifting banks' objectives from "profit only" to "profit with responsibility"[25]. Over a period of time, the concept of sustainability has evolved and its meaning transformed from only achieving higher profitability towards achieving the social and environmental objectives of the projects as well, and this concept is termed as corporate social responsibility (CSR)[26].

Table 1. Definitions of Green Banking

Author(s)	Definition
Azman 2012	Eco-friendly or environment-friendly banking to stop environmental degradation to make this planet more habitable
Bahl 2012	Green banking is a kind of banking conducted in selected areas and techniques that helps in reduction of internal carbon footprint and external carbon emissions
Singh and Singh 2012	Green banking signifies encouraging environment-friendly practices and reducing carbon footprint by banking activities through various environment-friendly acts
Bai 2011	Banks' environmental accountability and environmental performances in business operation
Thombre 2011	Green banking is functioning like a normal bank, which considers all the social and environmental/ecological factors with an aim to protecting the environment and conserving natural resources
Goyal and Joshi 2011 Habib 2010	Ethical bank – environmentally responsible bank Socially responsible bank or sustainable bank – considers all the social and environmental issues
Schultz 2010	This means promoting environmentally-friendly practices and reducing carbon footprint from banking activities

Source: authors' own elaboration based on: S.M.M. Rahman, and S. Barua, *The Design and Adoption of Green Banking Framework for Environment Protection: Lessons from Bangladesh*. Australian Journal of Sustainable Business and Society, 2(1), 2016, pp. 1–19.

[24] M.K. Verma, *Green Banking: A Unique Corporate Social Responsibility of Indian Banks*, "International Journal of Research in Commerce and Management", 3(1), 2012, p. 110.

[25] S.M.M. Rahman, and S. Barua, *The Design…*, *op. cit.*, p. 2.

[26] J. Amin, and M. Maran, *Bankruptcy and Sustainability: A Conceptual Review on Islamic Banking Industry*, "Global Business and Management Research: An International Journal", 7(1), 2015, p. 110.

The current trend in the literature on sustainability and finance is shifting from the idea that sustainability is a constraint on the profit function of firms towards a vision that financial markets can promote sustainability because of its many linkages with the rest of the economy. There are two major trends in the literature on sustainability and the banking industry, divided into external and internal practices. The external practices analyse the relevance of sustainability in the communication of banks with shareholders and stakeholders, and how investors use it as a measure in optimal portfolio allocation. The internal practices relate to the integration process of sustainability criteria into risk management towards lending practices[27].

Green banks' activities for sustainability concern external activities improving sustainability: offering preferential interest rates for credit borrowers who intend to use solar energy or encouraging borrowers to apply environmentally-friendly management systems, offering of affinity cards (credit cards where a certain amount of money (part of the commission charged by the bank) is given to a charity every time the card is used; they are issued with the approval of non-commercial organisations and are issued for philanthropic purposes), running sponsorship and humanitarian campaigns, satisfying customers' needs and simultaneous respect for law and ethics, honest communication with the banks' clients, providing complete information about an offer, prices, etc.[28]. Green banks' activities for sustainability concern internal activities improving sustainability: saving energy, reducing paper use, making use of paperless cash turnover, switching off or using reduced cooling after hours, using natural lighting where possible, use of ventilation by opening windows instead of full air conditioning, installing of modern thermal windows, controlling for dripping taps, rewards programme for good performance, implementing policies on sick leave and/or maternity leave, staff training and updating of training, developing of internal communications system, implementing preventive health security for their employees, and adequate employee wages (Table 2). Generally, economic sustainability deals with micro, macro, and industry-specific factors[29]. Therefore, green banks promote: forest preservation, water production, responsible farming practices, recycling, eco-tourism loans to displaced timber workers to help them start environmentally friendly businesses, help for low-wage earners to purchase homes, community education and mentoring programmes.

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[27] R. Zeidan, C. Boechat, and A. Fleury, *Developing a Sustainability Credit Score System*, 2016, pp. 1–2. Accessed on April, 2016 from: *https://umsbe.wufoo.com/*

[28] E. Rudawska, and S. Renko, *Sustainability as the Direction for the Long-term Success in Banking:* Poland *vs. Croatia*, "Folia Oeconomica Stetinensia", 1, pp. 106–107 and 112–113.

[29] J. Amin, and M. Maran, *Bankruptcy…*, *op. cit.*, pp. 113–114.

Table 2. The activities of Green Banks for sustainable development in Poland

Bank	Activities
Bank Ochrony Środowiska SA (Bank for Environmental Protection)	– The key component of the bank's mission is to contribute to environmental protection as its statute assumes an obligation to cooperate with ecological organisations, – Establishing and maintaining lasting relations with the National Environmental Protection and Water Management Fund, regional environmental protection and water management funds, the Polish Countryside Development European Fund, – It supports: the Natura 2000 Programme, donating part of the profit to All-Poland Society of Birds Protection and Green Lungs of Poland Fund by offering EKOKONTO and EKOPROFIT services, – The award of "Solid Employer" for modern and ethical human resources management.
PeKaO SA, PKO BP SA, Citi Handlowy SA, Fortis SA, Kredyt Bank SA	– Include developing relationships with their employees in their mission and their strategic goals, – Strive to provide a pleasant and favourable working environment for their employees and to maintain balance between their professional and personal lives, – Emphasise their aspirations to be perceived as the best employers in the banking sector, – Support charities and maintain good relationships with local communities by sponsoring cultural and artistic events and concerts by establishing their own charities.
ING Bank Śląski	– ING Foundation for Children whose aim is equal opportunities by providing chronically ill children with education,by promoting business awareness among young people and by helping young people from poor families gain access to higher education, – Running a programme called "In the company of a Lion" whose aim is to provide aid for children with cancer. The programme was honoured in the Golden Clip 2005 competition in the category of CSR.
BGŻ BNP Paribas (earlier Fortis Bank)	– Foundation BGŻ BNP Paribas whose objective is to counteract social exclusion of children and young people; the foundation entered into a strategic partnership with the Society of Children's Friends, – Joining the Strategic Partners of the Responsible Business Forum.

Bank	Activities
mBank (earlier BRE Bank)	– Joining the Strategic Partners of the Responsible Business Forum.
PKO BP SA	– Affinity cards support the Programme of Building Polish Artificial Heart.
BISE, BPH, BZ WBK, Polbank EFG	– Affinity cards support the Fund for Fulfilled Dreams.
Bank Millennium	– Affinity cards support the WWF.

Source: authors' own elaboration based on: E. Rudawska and S. Renko, *Sustainability as the Direction for the Long-term Success in Banking: Poland vs. Croatia*, "Folia Oeconomica Stetinensia", 1, 2012, pp. 106–108 and the banks' Internet pages.

P. Kotler, H. Kartajaya and I. Setlavan are strongly opposed to the influence of short-term focused shareholders. They support the conclusion that most stock-owned companies are aimed at meeting the shareholders' expectations to such an extent that it severely impacts the company's long term investments and perspective[30].

M. Porter and M. Kramer noted that in the long run social and economic goals are not inherently conflicting but integrally connected[31]. They see a symbiosis between economic and social goals, and also between economic and social investments/returns; more precisely organisations must focus on what actions bring benefits both for them and for society. In L. Dziawgo's opinion, it is not a strategic conflict between economy and ecology in the long run. In the short run, it is only a tactical conflict between them. In this case, the company is not taking into account all the costs concerning natural resource utilisation[32]. The green bank's economic calculus, therefore, should take into consideration not only economic costs, but also environmental and social costs. This results in some important benefits for green banks: they increase their image, goodwill, reputation, attract capital, partners, gaining or retaining customers, reduce costs, increase environmentally-friendly loans, increase competitiveness and environmentally-friendly use of resources[33]. The green bank, therefore, should avoid pro-ecological activities that are only for

[30] P. Kotler, H. Kartajaya and I. Setlawan, *Marketing 3.0: From Products to customers to the human spirit*. Times Group Book, New Delhi 2010, p. 106.

[31] M.E. Porter and M.R. Kramer, *The competitive advantage of corporate philanthropy.* "Harvard Business Review", 80(12), 2002, p. 5.

[32] L. Dziawgo, *Zielony…*, *op. cit.,* p. 10.

[33] M. Dumitraşcu, L. Feleaga and N. Feleaga, *Green Banking in Romania.* "Annals of the University of Oradea Economic Series", 23(1), 2014, p. 617.

PR (public relations), IR (investor relations) and marketing in the short-run. They may result in greenwashing[34]. Instead of this, the green bank's activities should focus on creating value for the shareholder, taking into account the economic, environmental and social costs in the long-run.

The green bank realises its three-dimensional activities, not as a piece of property, but as a nexus of contractual and non-contractual relationships between and among a range of groups, of which the shareholders are but one[35]. Thus, the bank directors' obligation is to act in the best interests of the bank; not only in the best interests of the shareholders, but also the non-shareholder interests of its network. However, in this case, the directors are required to consider the social or environmental good of all participants in this web of relationships, besides profits for shareholders, in the discharge of their duty.

To sum up, the social sustainability of banking industry deals with minimising the impact of banking activities on society. Banks are aiming to achieve social sustainability. They need to develop ethical lending standards. Additionally, banks deal with the active involvement of their staff to take an active part in community fund rising, charity and other philanthropic work. The environmental sustainability of banks deals with avoiding and minimising the effects of banking activities that have a negative impact on the environment. Banks can achieve environmental sustainability by avoiding lending funds to those organisations whose businesses have a negative impact on the green environment. On the other hand, banks can grant funds to those organisations that are involved in renewable energy products and programmes. And last but not least, the economic sustainability of banks deals with the ability of business to maintain its high earnings along with the successful continuation of business activities in the longer run of the business cycle.

3. THE GREEN BANK NETWORK INTERACTIONS AND RELATIONSHIPS WITH STAKEHOLDERS

The analysis of industrial networks and green banking led to the conclusion of their important role in the development of sustainable industry. Nowadays, all business decisions are undertaken in relation to other industrial actors. Ecological decisions are also undertaken in relation to other industrial actors[36]. As stated

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34 L. Dziawgo, *Zielony…*, *op. cit.*, p. 185.

35 Australian Conservation Foundation, *Submission to Parliamentary Joint Committee on Corporations and Financial Services*, 2005, pp. 12–13.

36 H. Håkansson and A. Waluszewski, *Managing Technological Development, IKEA, the Environment and Technology*. Routlege, London, 2002 and E. Baraldi, G.L. Gregori and A. Perna, *Developing and embedding eco-sustainable solutions: the evolution of the Leaf House network*, 26th IMP-conference in Budapest, Hungary 2010.

above, the green banks are the main linkage for different rationalities of actors and different roles of investments in place as is stressed in industrial network theory, because green banks' main mission is to combine business and ecology for the benefit of customers.

All activities of the bank are accounted in the balance sheet (Table 3). The green bank aims at achieving profit only in financing pro-ecological business undertakings[37]. The balance sheet consists of assets and liabilities. On the assets side two groups of positions are distinguished, i.e. financial assets and fixed assets. The green bank uses its financial assets and fixed assets for its own sustainability and its stakeholders' sustainability. All the liability side deposits, internal funds, securities and profits also support sustainable development and oppose laundering money and doing dirty business.

Table 3. The model of balance sheet for sustainability of green bank

ASSETS	LIABILITIES
– Financial Assets (not for laundering money and doing "dirty business" – only ethical, social and ecological business – by stakeholders) 1) Cash 2) Loans 3) Securities – Fixed Assets (green building, green house, green investing by green bank)	– Deposits and Securities (not for laundering money and doing "dirty business" by stakeholders) – Own Funds (no owners or co-owners from "dirty business" or from laundering money procedures) – Profit (for owner or co-owner of green bank) for: 1) social activities (foundation of charities, education programmes, volunteering and philanthropy) 2) ecological activities (green investment, eco-parks, environmental programmes) 3) economic sustainable development – Reserve (for sustainability of green bank)

Source: authors' own elaboration based on the subject literature.

The basic activity of the green bank is lending by loans or securities. For that reason the main users of green banks are credit departments and treasury departments, which use deposits and securities to collect resources. The green bank is a nexus of stakeholders' relationships. This is particularly noticeable in the connection between lending and green investments. The bank has to assess the credit risk of investment and later has to monitor the process of investing.

[37] L. Dziawgo, *Zielony…*, *op. cit.*, p. 62.

The green bank and the investor are bounded by the credit contract. Both bank and investors in business networks are never independent, isolated or alone; they are formed in their perceptions, knowledge, capabilities and intents by others[38].

The bank and the investors connect their resources. A relationship connects two heterogeneous collections of the two parties' resources – the bank (takes deposits and sells securities or issues its own securities) and the investor (deposits money and buys securities). As it develops, the two companies direct and orient some of their resources towards each other. Adaptations are made in resource features and in the use combinations. A relationship between two companies can tie together more or less tightly some of their resources in a specific way[39].

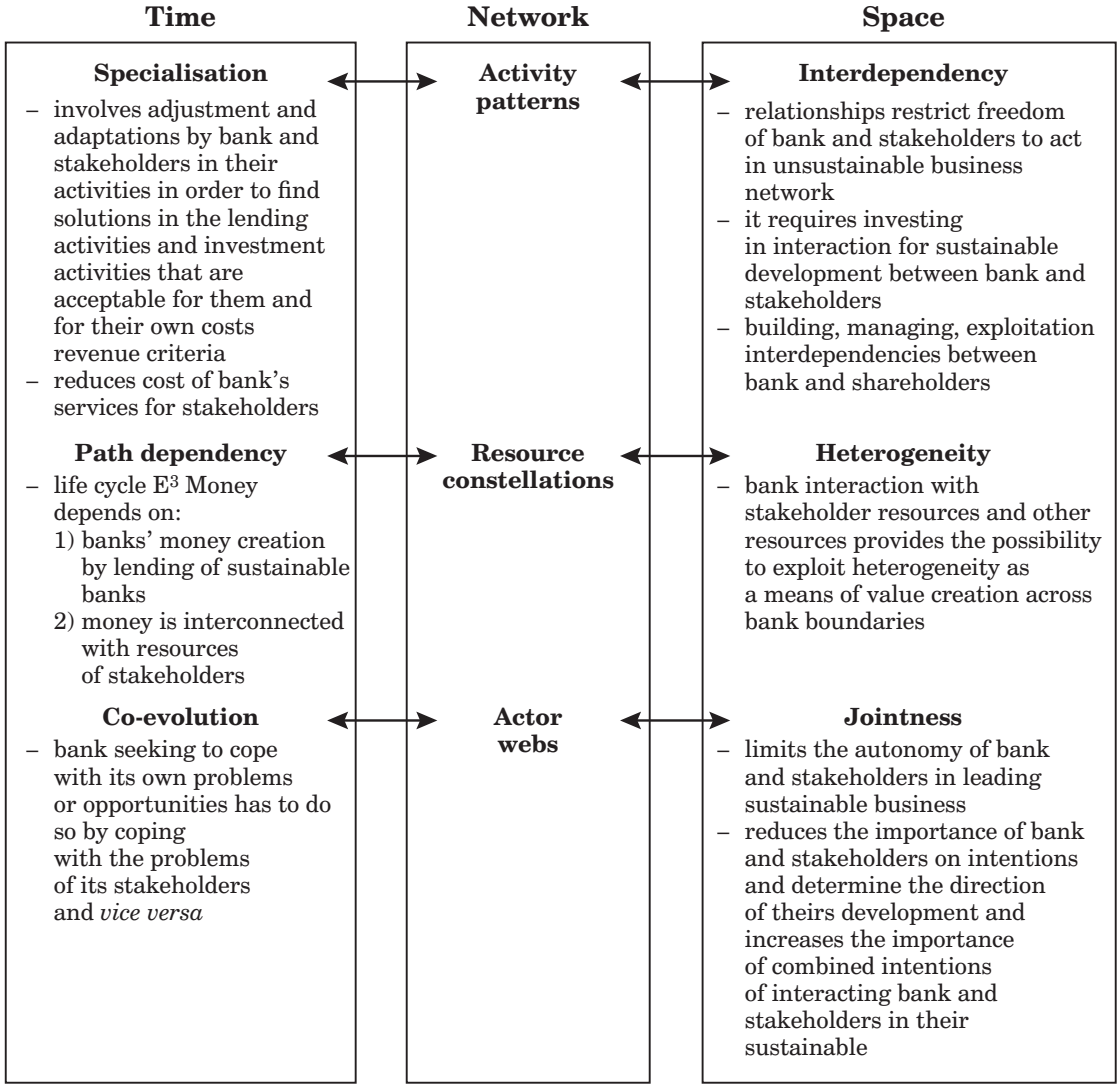
In the network, lending by the bank interconnects stakeholders. It limits the freedom of stakeholders in using the bank's money for an aim other than sustainable business. These independencies provide a way for bank and stakeholders together to capitalise on the specific investments that they make in their own and each others resources[40]. It serves for building trust, commitment and reciprocity.

The model for business interactions of the green bank with stakeholders has been based on the industrial network model (Figure 1). Specialisation reduces the cost of the bank's services and costs to stakeholders through adjustments and adoptions. Resource constellation overtime depicted as a lifecycle seems to be based on two basic features of most resources of bank E3 Money, otherwise known as ethical, ecological and electronic money. This money is created in a sustainable bank and is being lent to the sustainable businesses of stakeholders. Sustainable business is ethical, ecological and economic. Interaction enables the heterogeneity of the bank's resources to be exploited as a means of value creation for stakeholders and the bank. Actor webs link to co-evolution and jointness. Co-evolution strengthens the trust, commitment and common motivation in solving problems for sustainable development. On the other hand jointness limits the autonomy of bank and stakeholders and requires interactions. The green bank will attach a price to this reduction uncertainty through interest rate and provision. So tariff differentiation for sustainability can be justified from a risk standpoint: clients with high environmental risks will pay a higher interest rate. The possibilities for tariff differentiation will be even larger if banks can attract cheaper money – by paying less interest for their own funding because of the relatively high quality and lower risk of their credit portfolio. This tariff differentiation by banks will stimulate the internationalisation of environmental costs in market prices. In

[38] H. Håkansson and I. Snehota, (Ed.), *Developing…*, *op. cit.*, p. 193.
[39] *Ibidem*, p. 136.
[40] D. Ford and H. Håkansson, *The Idea of Business Interaction*, "The IMP Journal", 1(1), 2006, p. 11.

this sense, banks are a natural partner of governments[41]. The green bank with the main public shareholder is facilitated in offering ecological credits. Although, playing the high role of public government in supporting green banking is extended worldwide. It gives also a perspective of the long-term value.

Figure 1. The model of business interactions of green bank with stakeholders



Source: authors' own elaboration based on: H. Håkansson, D. Ford, L.-E. Gadde, I. Snehota and A. Waluszewski, *Business in Networks.* John Wiley & Sons Ltd, West Sussex 2009.

41 M. Jeucken and J.J. Bouma, *The changing environment of banks*, [in:] J.J. Bouma, M. Jeucken, and L. Klinkers, (Eds.) *Sustainable Banking. The greening of finance*, Deloitte & Touche, Greenleaf Publishing, UK 2001.

The green bank may well go a qualitative step further and contribute to sustainability on ideological grounds as well on risk assessment grounds. Through their intermediary role, green banks may be able to support progress toward sustainability by society as a whole – for example, by adopting a 'carrot-and-stick' approach, where environmental front-runners will pay less interest than the market price for borrowing capital, while environmental laggards will pay a much higher interest rate. This may result, at least initially, in a loss of profitability, but certainly doesn't require a loss of continuity[42].

Green banks support a long-termist and profits-only mentality that appreciates much environmental and social reality. Therefore green banks are not hindering the achievement of sustainability. Although non-green banks play a hindering role in the achievement of a sustainable industrial network, in contrast to green banks. First, non-green banks prefer short-term payback periods, while many investments necessary for achieving sustainability must be long-term. Second, investments that take account of environmental side-effects usually have a lower rate of return, while non-green banks usually look for investments with the highest rate of return[43].

To sum up, in sustainable industrial networks of profit and benefit maximisation, companies will take account of the environmental side-effects of their economic decisions as long as the environment is represented in the prices on which they base these decisions. Green banks facilitate in taking these decisions. As a financial intermediary between market players, a bank has four important functions. First, it transforms money by scale. The money surpluses of one person are mostly the same as the shortages of another person. Second, banks transform money by duration. Creditors may have short-term surpluses of money, while debtors mostly have a long-term need for money. Third, banks transform money by spatial location (place). For example, a bank brings money from a creditor in Stockholm to a debtor in Warsaw. Four, banks act as assessors of risk. As a rule, banks are better equipped to value the risks of various investments than individual investors who have surpluses available. In addition, through their larger scale, banks are more able to spread the risks[44].

4. CONCLUSIONS

In the paper the industrial network model has been applied for conceptualisation of the green bank model as a network of participants, resources and activities in time and in space. It is observed that the interdependency of network nodes exists.

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42 *Ibidem*.

43 *Ibidem*.

44 *Ibidem*, X. Freixas, and J.-Ch. Rochet, *Microeconomics of Banking*, MIT, USA 2008 and K. Matthews, and J. Thompson, *The Economics of Banking*, John Wiley & Sons Ltd, England 2005.

The network nodes are investing in long-lasting relationships. In the long run, environmental, social and economic goals are not inherently conflicting, they are integrally connected.

The relationships of the green bank with the stakeholders analysed using the industrial network model show the complexity of the business network it creates and the heterogeneity of its business partners, its interconnections and business relationships. Both bank and investors in business networks are never independent, isolated or alone; they are formed in their perceptions, knowledge, capabilities and intents by others. Green banks in a sustainable industrial network allow the development of activities, resources and actors combining business and ecology.

The green bank works to mobilise other industrial actors to undertake activities and devote resources to implement network strategies of sustainable development. Therefore, green banks in sustainable industrial network allow the development of activities, resources and actors combining business, society and ecology. In this way, green banks serve to aid the process of combining business, society and ecology and they will have added value for the sustainable development playing the role of investor, financier, educator, adviser, promoter and coordinator of sustainable industrial networks.

Abstract

The paper aims to analyse the role of green banking in organising a sustainable industrial network. The main hypothesis of the paper is that the green bank works to mobilise other industrial actors to undertake activities and devote resources to implement network strategies of sustainable development. The main contribution of the paper is the proposition of integrating network analysis into the complex structure of green banking system interactions and relationships with the industrial system, which aim at eco-development into a coherent industrial ecosystem. The conceptualisation of a green banking network using the industrial network approach is configured to address explicit environmental and social issues. The main assumption of the sustainability network model is that the relationships of banks with stakeholders (i.e. suppliers, employers and customers) are based on mutual benefit and sustainability outcomes.

Key words: Green banking, ecosystem, industrial network, sustainable development

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