

## Forms of Supporting Local Innovative Business Activity in European Countries

OLEKSANDR FEDIRKO<sup>1</sup>

**ABSTRACT.** The article investigates contemporary trends of innovation policy of European countries, describes the essence of contemporary mechanisms and tools for supporting local innovative development. The following most powerful tools for facilitating scientific and technical and innovative business activity are discovered: direct support of private R&D, financing of innovative enterprises, governmental and private cooperative scientific and research projects. A trend is identified for decreasing the share of institutional financing of R&D, and increasing of weight of competitive financing of academic institutions. A conclusion is made as for spreading of technologies commercialization processes support, especially on final stages thereof; the share of these has increased in respect of governmental programs focused on early stages of scientific and research projects.

An insight is that within the last two decades the tools for facilitating local innovative business activities have been diversified in the EU: alongside with long-term collaborative governmental and private R&D and initiatives for developing innovative science intensive clusters, short-term tools have been significantly spread, such as innovation projects vouchers and science intensive start-ups support. Given that, it is established that traditionally developed toolkit for supporting small and medium enterprises is being complimented with scaled programs of large companies direct financing.

A general trend is identified for increasing the weight of collaborative programs, while the share of individual subsidies and grants for R&D and that of companies innovative activity has substantially decreased. Higher effectiveness of start-ups facilitation measures is concluded, as well as that of venture investments, in comparison with individual subsidies. The leading role of start-ups in EU economy is determined by a range of advantages originating from dynamic process of formation thereof, namely producing large number of new ideas, innovative projects diversification, creation of new jobs. However, the key feature of start-ups is that these are indicators of favourable local innovative environment, since fast increase of start-ups and spin-offs number in a given region is an indicator of accumulating "critical weight" in process of forming dynamic innovative clusters.

**KEYWORDS.** Innovation policy, local innovative business activity, mechanisms and tools of supporting local innovation development, commercialization of technologies, scientific and technical collaboration, technologies transfer, science intensive clusters, start-ups, vouchers for innovative projects, competence centres.

### Introduction

The evolution at the contemporary stage of economic knowledge in the European Union is based upon deep confidence of European society in innovative way of development as the only possible one. Even during

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<sup>1</sup> **Oleksandr Fedirko** – Ph.D. in Economics, Associate Professor, Deputy Head of the Department of European Integration of SHEE "Kyiv National Economic University named after Vadym Hetman". Sphere of scientific interest: regional and local innovative development, European integration, scientific and technical, business, competitive, energy, foreign economic policies of the European Union, international competitiveness. E-mail: alexfedirko@yahoo.com.

one of the most severe global currency and financial crisis at the end of 2010s, the member countries have not only retained, but even extended their expenses for financing the scientific and technical and educational potential, technologies transfer systems, and programs for innovative business activity facilitation. In many countries of the world, the contemporary innovative policy relies upon the theory of national innovative systems based on construing innovative activity as an interactive process of interaction of large number of specialized players forming knowledge triangles. Thus, the dominating base of national innovative policies is the model of open innovations, with its core being the improvement of systemic collaborative relations between science and business, creation of sectoral and topical networks, development of new technologies commercialization infrastructure etc.

The problems of regulating innovative activity of private companies, as well as the mechanisms of developing high-technology business models in the EU have been investigated in numerous works of domestic and foreign scientists, among which the most significant insights worth mentioning are those of V. Biloshapka, S. Borrás<sup>2</sup>, M. Enright<sup>3</sup>, K. Ketels<sup>4</sup>, D. Lukyanenko<sup>5</sup>, Ye. Panchenko<sup>6</sup>, M. Porter, S. Sokolenko<sup>7</sup>, O. Solvell<sup>8</sup> and many others.

Alongside with that, the extension of local and national technologies transfer networks is an essential, but insufficient condition of generating strategic competitive advantages of European business. Therefore, a vital element of competitiveness strategies is engagement of local high technologies market players into global and international research networks enabling the access to new original ideas and developments from all over the world, which, in these terms, may be more competitive and complementing to companies competence potential than innovative intellectual products existing in local or national environment.

Hence, the article is aimed at investigating contemporary mechanisms and tools for supporting local innovative business activity in EU countries, and identifying competitive advantages and weak points established within cluster of national innovation systems.

<sup>2</sup> Borrás, S. *The innovation Policy of the European Union. From Government to Governance*. Cheltenham: Edward Elgar, 2003.

<sup>3</sup> Enright, M. J. "Regional clusters and economic development: a research agenda ." in U. H. Staber, N. V. Schaefer, B. Sharma (Editors) *Business networks : prospects for regional development* , 190-213. Berlin: De Gruyter, 1996.

<sup>4</sup> Ketels, C., and S. Protsiv. *European Cluster Panorama 2016* . Report. Stockholm: Center for Strategy and Competitiveness Stockholm School of Economics, 2016. 1-68.

<sup>5</sup> Lukyanenko, D. *Paradigm of creative management in the global economy [Paradyhma kreatyvnoho menedzhmentu v hlobal'nij ekonomitsij]*. Kyiv: KNEU, 2016. [In Ukrainian]

<sup>6</sup> Panchenko, Ye., and M. Voichak. "State support of the high-tech exports: comparative analysis and lessons for Ukraine" [Derzhavna pidtrymka vysokotekhnolohichnoho eksportu: komparatyvnyj analiz ta uroky dlia Ukrainy]. *International Economic Policy* 2, no. 25 (2016): 99-125.

<sup>7</sup> Sokolenko, S. *Clusters in the global economy [Klastery v hlobal'nij ekonomitsij]*. Kyiv: Logos, 2004.

<sup>8</sup> Solvell, Ö., G. Lindquist, and C. Ketels. *The Cluster Initiative Greenbook Stockholm* . Stockholm: Ivory Tower, 2003.

## Main part

Trends of forming the toolkit for supporting innovative business activity in the EU. As shown by the scaled investigation based upon database created as an outcome of long-term (from 1999 till 2012) project *INNO Policy TrendChart* in the EU, and as a result of *Erawatch network* operation on national level of 27 countries of the EU, Norway and Switzerland, there have been identified 2083 innovation policy measures, among which three main tool groups are distinguished<sup>9</sup>: competitive governmental financing of scientific and research programs; collaborative scientific and research programs supporting scientific and technical cooperation between governmental research organizations and private companies; direct support of scientific and research and innovative activity of private sector through provision of credits and grants.

The general trend observed within the investigated period from 1999 till 2012 is increase of collaborative programs weight, while the share of individual subsidies and grants for R&D and the one of companies innovative activity has been substantially reduced. Measures for facilitating start-ups and venture investment have appeared more effective than individual subsidies. Furthermore, the orientation of innovative policies for commercialization of new technologies has been growing.

It is found that during the relevant period certain stability of content and structure of measures for facilitating countries innovative development has been observed. Given that, the fact is quite surprising that the toolkit of innovative policies of European countries has been homogeneous, even considering the availability of notable asymmetries both in the structure of economics of integration union countries and in the levels of their technological development. On one hand, it may reflect the ambition of new EC member countries to increase the labour productivity by virtue of implementing industry innovative development programs, and on the other hand, the active adaptation (and in some cases, copying) by new member countries of the best practices of technologically leading countries of the EU through networks for exchanging expertise in the sphere of implementing innovation policy.

Average duration of innovation development programs in EU countries comprises seven years. Given that, some tools (development of intellectual capital, direct support of private R&D) are more long-term, while new tools (vouchers for innovative projects) presume substantially shorter periods. Generally, in old EU member countries featuring higher level of technological development, the duration of innovation policy tools is longer than the one in new member countries. This evidences the

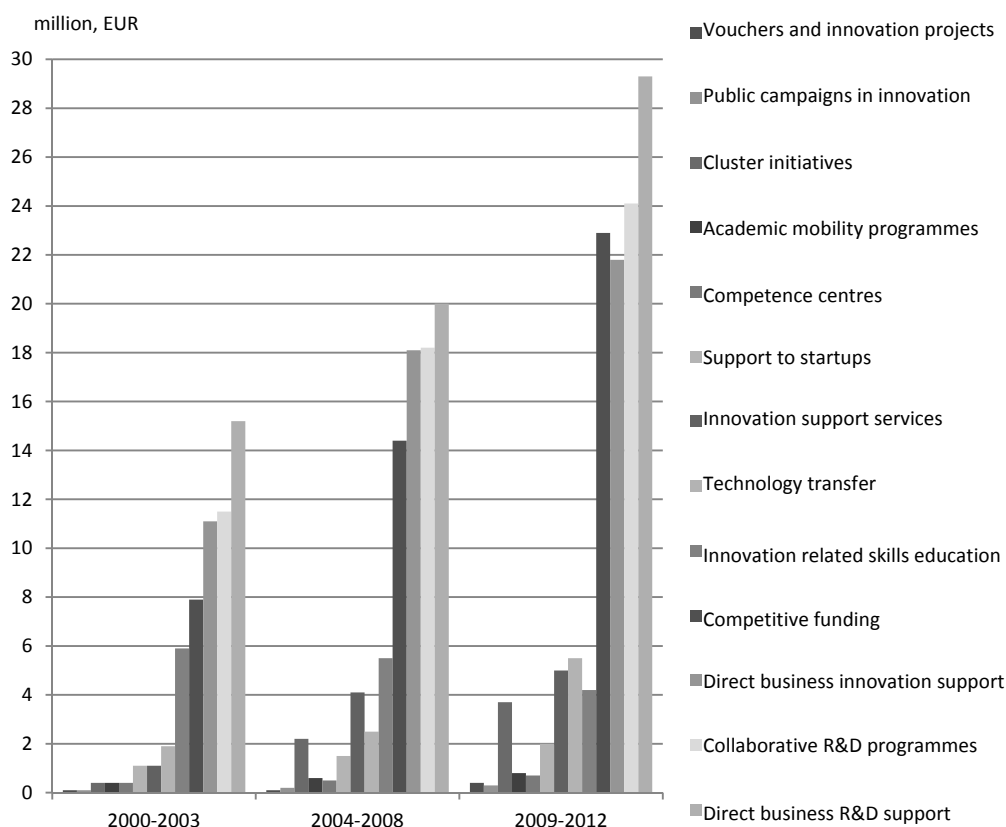
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<sup>9</sup> Izsák, K., Markianidou P., and S. Radošević *Lessons from a Decade of Innovation Policy*. Report. Brussels: European Commission, Enterprise and Industry, 2013: 6, 16.

transfer of old EU member countries to more mature stage of their innovation policy evolution.

The most frequent tool of financing business innovations have been grants with their share in the EU sustainably exceeding 65%. However, in the period of crisis, especially in 2010-2011, subsidized loans have abruptly gained popularity, with their share exceeding 25% of all tools introduced by member countries for facilitating innovation development.

Within the structure of innovation development objects, it is worth mentioning the increased role of collaborative research programs, competitive financing of academic institutions, as well as direct tools of financing R&D and innovations in private sector (Fig. 1).



**Fig. 1.** Structure of financing the scientific and technical innovative activity of EU countries, Norway and Switzerland in terms of expenses nature<sup>10</sup>

<sup>10</sup> Compiled by the author based: Izsák, K., Markianidou P., and S. Radošević *Lessons from a Decade of Innovation Policy*. Report. Brussels: European Commission, Enterprise and Industry, 2013: 19.

The highest expenses for direct support of private R&D are caused by increased volumes of subsidized loans for innovative projects. At the same time, the share of technological transfer tools has drastically increased in the period of crisis — from 2009 till 2012, — while the weight of innovative capabilities programs and civil campaigns in the sphere of innovations promotion has decreased rapidly.

German model of facilitating innovative business activity. In general, it is the system of supporting innovative business possessing its quite explicit national features that is the most complicated structure in terms of tools and regulating mechanisms composition. In particular, in Germany the leading tool for supporting space localization of innovative business activity is the initiative "Competitiveness of super-contemporary clusters" (*'Spitzencluster-Wettbewerb'*) financed by the Federal Ministry of Education and Research of Germany. The financing object refers regional high-technology cluster initiatives, in which science representatives cooperate with business. On each financing stage, up to five leading clusters shall receive financing amounting to EUR 200 mln<sup>11</sup>. Within the period from 2008 till 2014, the Federal government of Germany has invested EUR 360 mln into the program<sup>12</sup>. The final selection stage has taken place in 2012, and as by 2017, there have been selected 15 clusters with 5-year budget in total amounting to EUR 40 mln<sup>13</sup>. Towards supporting the international aspect of cluster interaction within the program of "super-contemporary clusters", in 2015 the Ministry has initiated the program "Internationalization of super-contemporary clusters, future projects and equivalent networks" (*'Internationalisierung von Spitzenclustern, Zukunftsprojekten und vergleichbaren Netzwerken'*). It is planned to select 11 clusters entitled for receiving up to EUR 4 mln for the period up to five years for developing and implementation of internationalizing their activity<sup>14</sup>.

An important role belongs to the tools for facilitating the commercialization of already developed technologies and those for developing innovative business. One of such programs in Germany is *EXIST (Existenzgründungen aus der Wissenschaft)* initiative launched by the Federal Ministry of Economy and Technologies in 1998 and supported by the European Social Fund; this initiative provides support

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<sup>11</sup> BMBF-Internetredaktion. "Der Spitzencluster-Wettbewerb — BMBF." Bundesministerium für Bildung und Forschung — BMBF. April 07, 2017. Accessed May 04, 2017. <https://www.bmbf.de/de/der-spitzencluster-wettbewerb-537.html>.

<sup>12</sup> *Germany's Leading-Edge Clusters*. Report. Berlin: Federal Ministry of Education and Research (BMBF) Division for New Innovation Support Instruments and Programmes, 2014: 2.

<sup>13</sup> Sofka, W., and Sprutacz M. *RIO Country Report 2015: Germany*. Report no. EUR 27870 EN. Luxembourg: Publications Office, 2016: 41.

<sup>14</sup> "Internationalisierung von Spitzenclustern, Zukunftsprojekten und vergleichbaren Netzwerken." Projektträger Jlich: Internationalisierung von Spitzenclustern, Zukunftsprojekten und vergleichbaren Netzwerken. Accessed May 04, 2017. <https://www.ptj.de/internationalisierung-spitzencluster>.

for entrepreneurs originating from academic sector. It is the sub-program “*EXISTForschungstransfer*” that supports commercialization of technologies and contributes to creation of 90 new companies within the period from 2007 till 2014. In 2014, the sub-program budget has been extended from UAH 70 thousand to UAH 250 thousand<sup>15</sup>. Another program of the Ministry, “Protection of Ideas for Commercial Use” (*Schutz von Ideen für die Gewerbliche Nutzung – SIGNO*), has been adopted for providing advice services in the sphere of commercial use of innovations. From 2008 till 2014, 542 patent applications have been submitted under the program, 530 patent sales contracts and 375 license agreements have been concluded<sup>16</sup>.

The toolkit for supporting innovative activity is especially developed in small and medium enterprises (SME) sector. The central innovative program for SME (*Zentrales Innovationsprogramm Mittelstand – ZIM*) is an initiative of the Federal Ministry of Economy and Technologies of Germany providing financing to SME in all economy sectors under criteria of innovativeness and potential for commercialization of newly created products or technologies. Creation of interfirm networks for innovative collaboration is also encouraged. From 2008 till 2014, 29 thousand projects have been supported, with budget in total comprising EUR 3.9 bln<sup>17</sup>. The problem of innovative SME access to financing is solved by virtue of *ERP-Innovationsprogramm*, in terms of which credit financing is proposed with concessionary interest rates, and non-secured credit tranches. In 2014, microloans have been provided to more than 600 enterprises for the total amount of EUR 1.33 mln. Consultancy support of SME innovative activity is effected in frames of innovative vouchers program (*BMW-i-Innovationsgutscheinen, go-Inno*). Professional consulting companies receive 50% payment of their service costs from governmental funds. There exist two types of consultancy support – one concerning product innovations (*‘go-innovativ’*) and one concerning process innovations (*‘go-effizient’*). The majority of voucher system beneficiaries (80%) report substantial retrenchment of expenses (in average, by EUR 200 thousand yearly), or commencing research and innovation projects<sup>18</sup>.

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<sup>15</sup> Sofka, W., and Sprutacz M. *RIO Country Report 2015: Germany*. Report no. EUR 27870 EN. Luxembourg: Publications Office, 2016: 44.

<sup>16</sup> “Dr. Marianne Kulicke Arbeitspapier der wissenschaftlichen Begleitforschung zu EXIST — Existenzgründungen aus der Wissenschaft Fraunhofer-Institut ...»." Dr. Marianne Kulicke Arbeitspapier der wissenschaftlichen Begleitforschung zu EXIST — Existenzgründungen aus der Wissenschaft Fraunhofer-Institut. Accessed May 04, 2017. <http://www.book.dislib.info/b1-other/17565-1-dr-marianne-kulicke-arbeitspapier-der-wissenschaftlichen-begleitfor.php>.

<sup>17</sup> Sofka, W., and Sprutacz M. *RIO Country Report 2015: Germany*. Report no. EUR 27870 EN. Luxembourg: Publications Office, 2016: 46.

<sup>18</sup> *Ibid*, p. 46.

The program of the Federal Ministry of Economy and Technology of Germany, *KMU-innovativ*, provides support to leading research and innovation projects with high potential for commercialization within nine technological spheres: biotechnology, medical services, information and computer technologies, nanotechnologies and new materials, production technologies, technologies for resources and energy efficiency, photonics, electronic systems and e-mobility, civil safety research. The grant program *IKT Innovativ* is even more specialized tool conducting competitive selection of innovative start-up projects in the sphere of information and communication services and products, providing grants amounting up to EUR 30 thousand, as well as training and consultative support and access to professional networks.

Format of innovative companies support in France. French national reforms program provides for extensive list of tools for supporting innovative business and commercialization of innovations<sup>19</sup>. The paramount task consists in extending innovative business financing through a range of programs, in particular: *Investments Into Future* directing funds to IT innovations, industry and power engineering modernizations, ecologization etc comprising EUR 47 bln (first two tranches) and EUR 10 bln (third tranche in 2017); state investment bank *BPIFrance*, by virtue of which loans amounting to EUR 12.5 bln in 2014 the funds have been received by 15 thousand small companies and 1600 medium ones.

Equal importance is given to development of cluster initiatives: "poles of competitiveness" should transform into "factories of future goods and services" changing SME relations with large business groups. At present, in France the key role in the system of facilitating the commercialization of industrial innovations belongs to the initiative *New Face of Industry* <sup>20</sup>focused on creating future industrial systems in selected economy sectors by means of creating nozzles (French – 'filiures'), i.e. technologically connected future industrial chains. In this context, in October 2013, the Ministry of Industry of France has developed 34 plans for industrial revival, with a view to the budget of *Investments Into Future* program and existing cluster initiatives, enabling the creation of 9 technological solutions for French industry – "new resources", "smart cities", "eco-mobility", "transport of future", "medicine of future", "digital economy", "smart gadgets", "digital data safety", "smart eating". On the first stage, 250 companies have been engaged for creating joint governmental and private partnerships in

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<sup>19</sup> Bitard, P., and Zacharewicz T. *RIO Country Report 2015: France*. Report no. EUR 27949 EN. Luxembourg: Publications Office, 2016. 27.

<sup>20</sup> "The New Face of Industry in France ." *Ministere du Redressement Productif*. Accessed May 4, 2017. [http://www.entreprises.gouv.fr/files/files/directions\\_services/secteurs-professionnels/industrie/nfi/NFI-anglais.pdf](http://www.entreprises.gouv.fr/files/files/directions_services/secteurs-professionnels/industrie/nfi/NFI-anglais.pdf).

terms of above mentioned topical priorities of industrial development. As a result, more than 330 projects have been supported with total cost sheet of EUR 3.7 bln (with state contribution comprising EUR 1.5 bln)<sup>21</sup>. It is worth mentioning that the executed projects have been closely inter-related and complimenting. Financing of the initiative on the second stage of its implementation is provided from a few sources: tax exemptions amounting to EUR 2.5 bln during 2015, *BPIFrance* loans for SME amounting to EUR 2.1 bln during 2015-2016<sup>22</sup>.

Alongside with powerful national high-technology companies, significant governmental support has been also received by young innovative entrepreneurs. The Ministry of Education, Higher Education and Research of France has implemented a range of the relevant programs. One of such measures is the national contest for creating innovative technologies companies, *i-LAB*, in course of running of which (from 1999) there have been supported more than 1700 start-ups, 70% of which are being successfully operated at present<sup>23</sup>. Furthermore, after its launching in 2004, the Ministry initiative *Young Innovative Enterprises* has already provided support to three thousand service companies amounting to EUR 108 mln in the form of exempting from social dues, thus facilitating their expenditure for R&D amounting to EUR 700 mln<sup>24</sup>.

In addition to measures already described, in 2014 the program *Student Entrepreneur Status* has been launched, under which young people possessing bachelor diploma pay only EUR 500 for company registration within 2014-2017. Business projects are selected by specially created committee *PEPITE* (*Peuples Étudiants pour l'Innovation, le Transfert et l'Entrepreneuriat*), having established the national network of 29 centers. The student entrepreneur status provides a notable range of advantages, namely: access to coaching services by lecturers and partners of *PEPITE* partners; access to coworking grounds of the network; option for signing corporate support contract (*Contrat d'Appui d'Entreprise – CAPE*) with a business incubator or a *PEPITE* partner<sup>25</sup>.

Anglo-Saxon model of innovative business development. In the United Kingdom of Great Britain and Northern Ireland the orientation for commercialization of scientific developments is especially high. It is reinforced by governmental programs for start-ups facilitation, one of

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<sup>21</sup> Ibid.

<sup>22</sup> Ibid.

<sup>23</sup> Bitard, P., and Zacharewicz T. *RIO Country Report 2015: France*. Report no. EUR 27949 EN. Luxemburg: Publications Office, 2016: 75.

<sup>24</sup> Ibid.

<sup>25</sup> Bitard, P., and Zacharewicz T. *RIO Country Report 2015: France*. Report no. EUR 27949 EN. Luxemburg: Publications Office, 2016: 76.



the most successful of which is the initiative *Start Up Loans* launched in 2012 with the aim of providing financial and consultative support to young entrepreneurs. Within the first year of program implementation, around EUR 60 mln have been loaned to ten thousand entrepreneurs. In view of high efficiency of the program, the government has extended its budget for other EUR 200 mln and lifted age restrictions for the applicants<sup>26</sup>. On the current stage, start-ups development policy has obtained new accents with implementing "The Productivity Plan"<sup>27</sup> prioritizing facilitation of dynamic growth of high-productive SMEs. Thus, in Great Britain the term *start-up* popular in innovation policy is being substituted by a new category – *innovative scale-up*<sup>28</sup>.

As it is obvious from international experience, the environment favourable for dynamic innovative development should include the tools of not only financial, but also of organizational and economic nature. The infrastructure of innovation development in Great Britain is represented, first of all, by technoparks and business incubators being usually created by higher educational establishments of the country in cooperation with regional and local authorities and non-governmental organizations for regional development. The association of scientific parks of Great Britain includes more than 100 participants involving more than 4 thousand developing companies employing 75 thousand persons<sup>29</sup>. On the current stage, not only the number of intermediary institutions contributing to innovative development is growing, but the types thereof are being diversified. In that respect, in 2011-2015 the network of connecting centre *Catapults* has functioned ensuring the cooperation of researchers from governmental and private sector on late stages of scientific and technical projects. The budget amounting to GBP 240 mln has been used for providing premises and equipment for "medium readiness" projects, being quite vulnerable in terms of open market competition. At the moment, 9 such centres operate specializing in high-technology machining industry, cell therapy, renewable sea power engineering, satellite software, digital communication technologies, cities of future, precise medical appliances, transport and energy systems. In 2014, a new national network of University *Quantum Technology Hubs* has been launched with budget amounting to GBP 120 mln (EUR 160 mln). Located in Birmingham, Glasgow, Oxford and York, the quantum hubs network includes 13 universities

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<sup>26</sup> Cunningham, P., and Mitchell J. *RIO Country Report 2015: United Kingdom*. Report no. 27875 EN. Luxemburg: Publications Office, 2016: 64.

<sup>27</sup> *Fixing the foundations: Creating a more prosperous nation*. Report. HM Treasury. London: Williams Lea Group, 2015: 1–82.

<sup>28</sup> Cunningham, P., and Mitchell J. *RIO Country Report 2015: United Kingdom*. Report no. 27875 EN. Luxemburg: Publications Office, 2016: 64

<sup>29</sup> "Members." UKSPAs RSS. Accessed May 04, 2017. <http://www.ukspa.org.uk/members>.

and 132 companies, owning the budget amounting to GBP 60 mln (EUR 80 mln)<sup>30</sup>.

Ireland innovation policy has equally ambitious aims in the sphere of innovative business development. In particular, the most relevant tasks are established as follows:

- increase of new start-ups number by 25% (3 thousand new enterprises annually);
- improvement of enterprises survival level during first five years of their activity by 25% (by 1800 non-bankrupting companies more annually);
- growing of start-ups capability for dynamic development by 25%<sup>31</sup>.

The backbone of institutional structure for supporting innovative business in Ireland is governmental agency *Enterprise Ireland* possessing branched network of local Enterprise offices. The agency's initiative *High Potential Start-Up – HPSU* has been developed for supporting new enterprises producing innovative goods and services for sale in international markets. Each such enterprise should create at least 10 jobs and achieve turnover amounting to EUR 1 mln during 3-4 initial years of its existence. Another tool for supporting local innovative business is *New Frontiers* program aimed at contributing to start-ups development on early stages of creation thereof. A range of trainings has been conducted within 2012-2014 in context of the program, and a range of supporting services and financing for 445 program participants has been provided. An equally effective initiative is innovative voucher program *Innovation Voucher scheme* aimed at financing collaborative projects of governmental academic establishments and SME, for implementation of which within 2013-2014 *Enterprise Ireland* has allotted EUR 2.6 mln per year.

For a long time, applied research program *Applied Research Enhancement*<sup>32</sup> – *ARE* has been successfully functioning in Ireland, the aim of which was to establish competences in national technological institutes required to satisfy industrial enterprises demands<sup>32</sup>. Their contemporary heir is *Technology Gateway* program (2013-2018)<sup>33</sup> being a netified model for improving technological competencies of industrial companies by means of further expanding their cooperation with technological research institutes. With this aim, a network of 12

<sup>30</sup> *Annual Report and Accounts 2014-2015*. Report. Department for Business, Innovation and Skills. London: Williams Lea Group, 2015. 1–218.

<sup>31</sup> Martin, T. and La Placa G. *RIO Country Report 2015: Ireland*. Report no. EUR 27877 EN. Luxembourg: Publications Office of the European Union, 2016: 61.

<sup>32</sup> Martin, T. and La Placa G. *RIO Country Report 2015: Ireland*. Report no. EUR 27877 EN. Luxembourg: Publications Office of the European Union, 2016: 74.

<sup>33</sup> "Technology Gateway Programme ." Enterprise Ireland . Accessed May 4, 2017. [http://www.enterpriseireland.com/EI\\_Corporate/en/Research-Innovation/Companies/Collaborate-with-companies-researchinstitutes/Technology-Gateway-Programme.html](http://www.enterpriseireland.com/EI_Corporate/en/Research-Innovation/Companies/Collaborate-with-companies-researchinstitutes/Technology-Gateway-Programme.html).

technological portals has been created, where the latter not only connect companies to definite local research institutions, but also provide the access to nation-wide research infrastructure enabling business to find appropriate technological solutions for effecting innovative projects with high potential of market commercialization. Each portal will receive financing amounting to EUR 1.2 mln for five year period.

In 2014, two funds have been created in Ireland for supporting small and medium business projects: *R&D Fund Small Projects* and *R&D Fund Standard Projects*<sup>34</sup>. The first fund is supporting small business projects in the sphere of product, service or process innovations, providing grants amounting up to EUR 150 thousand. The grant funds may be used for paying of acquired R&D services: purchasing patents and licences at market prices, obtaining by SME of loan for hiring qualified scientific personnel from external academic organizations<sup>35</sup>. *R&D Fund Standard Projects* finances more scaled innovative measures capable to ensure convincing competitive advantages in target markets. Maximum R&D grant volume comprises EUR 650 thousand. The mechanism of grant financing presumes a regressive scale of complimentary fund contribution depending upon the company size. Thus, small companies receive grants amounting to 45% total value of the project, medium ones 35%, and large companies – only 25%. There is an opportunity for increasing grant amount (additional 15% full value) in case of submitting a collaborative project (i.e. the one where two or more companies cooperate), however, maximum amount of grant may not exceed 50% value of the project<sup>36</sup>.

Italian experience of innovation policy local implementation. In Italy the system for supporting innovative start-ups has been enacted in 2012. The Law No. 211/2012<sup>37</sup> has defined the term of innovative start-up and certified incubator, introduced simplified administrative procedures for start-ups registration, tax exemptions for start-ups personnel and investors, favourable legislative conditions in the sphere of regulating labour relations, extension of access to financing (credits, crowdfunding) and international markets<sup>38</sup>. According to the above mentioned law, a start-up is an enterprise incorporated within last 48 months and having its headquarters in Italy, with its main activity being innovations, with its annual turnover not exceeding EUR 5 mln, and where no profit

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<sup>34</sup> "R&D Fund Small Projects." Enterprise Ireland (EI). Accessed May 04, 2017. <http://www.enterpriseireland.com/en/Research-Innovation/Companies/R-D-Funding/R-D-Fund-Small-Projects-.shortcut.html>.

<sup>35</sup> Martin, T. and La Placa G. *RIO Country Report 2015: Ireland*. Report no. EUR 27877 EN. Luxembourg: Publications Office of the European Union, 2016: 74.

<sup>36</sup> "R&D Fund Small Projects." Enterprise Ireland (EI). Accessed May 04, 2017. <http://www.enterpriseireland.com/en/Research-Innovation/Companies/R-D-Funding/R-D-Fund-Small-Projects-.shortcut.html>.

<sup>37</sup> Nascia, L., and La Placa G. *RIO Country Report 2015: Italy*. Report no. EUR 27850 EN. Luxembourg: Publications Office, 2016: 24

<sup>38</sup> *Ibid*, p. 23.

distribution is performed. A specific feature of Italian legislation is availability of clear criterial base for identifying an innovative start-up:

- investments into R&D start-up should exceed 15% gross expenditure or production cost, whichever is larger;
- at least 33% possess Doctor of Science degree or pursue a doctorate, and at least 50% employees possess higher education;
- possessing intellectual property rights for at least one patent, trade mark or license<sup>39</sup>.

In 2015, the Law 33/2015<sup>40</sup> has amended the Law 211/2012 in terms of extending the range of its eligible beneficiaries: since then, the admissibility has been gained by companies incorporated within last 60 months, based in any EU country with at least a single unit in Italy. The new law also clearly determines the category of innovative SMEs as companies based in any EU country, controlling at least a single department in Italy, including incorporated enterprises, complying with at least one of the below requirements:

- investments in R&D comprise at least 3% gross expenditure or production cost (whichever is higher);
- 30% employees possess Doctor of Philosophy degree, and at least 50% personnel possess higher education;
- possessing intellectual right for at least one patent, trade mark or license<sup>41</sup>.

The leading national institution ensuring development of start-ups is *Invitalia*, a governmental agency reporting to the Ministry of Economic Development of Italy, with the efforts of which in 2015 there have been supported more than 600 innovative start-ups (with expenses and losses from under-receipt of taxes and duties comprising almost EUR 160 mln)<sup>42</sup>. Furthermore, a network of certified incubators has been established in the country providing services to support the creation and operation of new innovative firms, allowing them premises, arranging the access to broad band etc. At present, more than 30 certified business incubators operate in Italy, registered with the country Chamber of Commerce.

Starting from 2015, financial scales of start-ups support include *Smart&Start Italia* program with budget amounting to EUR 200 mln, the beneficiaries of which are innovative companies incorporated within the last 4 years. The funds are provided in form of interest-free loans to cover 70% of their investment projects costsheet<sup>43</sup>. Sectoral topical

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<sup>39</sup> Ibid, p 24.

<sup>40</sup> Ibid.

<sup>41</sup> Ibid.

<sup>42</sup> Ibid.

<sup>43</sup> Nascia, L., and La Placa G. *RIO Country Report 2015: Italy* . Report no. EUR 27850 EN. Luxembourg: Publications Office, 2016: 73.

priorities for developing commercially eligible technologies in Italy include information and computer technologies (*ICTAgenda digitale* program), ecological programs (*Industria sostenibile*), nanotechnologies, biotechnologies and modern production technologies. Financing in form of loans with privileged interest rates exceeds half-billion Euro, of which 60% funds are provided to SME. Besides the privileged loan programs for innovation-oriented companies, equal importance belongs to the network of national technological clusters (*National Technology Clusters*) focused on development of priority technological spheres ("green" chemical technologies; food products; technologies for residential premises; life sciences; technologies for smart-communities; systems and means for road and sea transportation; aerospace technologies; power engineering; "intelligent" factories). Beneficiaries of the cluster program (mainly SMEs) have received EUR 266 mln for implementation of 48 projects in 2012, EUR 100 mln in 2014, and other EUR 50 mln in 2015 in form of pledges and credit securities<sup>44</sup>.

Scandinavian model of innovative development. Systemic support of innovative SMEs activity is an equally important priority of Swedish policy, where governmental innovative agency *VINNOVA* has implemented a program for SMEs innovation-oriented development containing various forms of support in terms of annual budget amounting to EUR 42.6 mln<sup>45</sup>: innovation vouchers for developing innovative ideas (comprising up to EUR 11 thousand); program for assessing commercial potential of inventions on early stages of innovative projects (*Verifiering för tillväxt*) with budget amounting to EUR 6.4 mln; *Innovation projects in enterprises* program with annual budget comprising EUR 19.2 mln contributing to implementation of innovative projects potentially capable to enter international markets.

The *Swedish Incubators & Science Parks (SISP)* is a nation-wide non-profit association involving 65 members having created 43 business incubators and 33 scientific parks, 5 thousand companies employing 70 thousand persons<sup>46</sup>. To fulfil the key mission of creating science intensive companies, *SISP* members have created 70 creative grounds offering start-ups support, contributing to clusters development, engaging venture capital and generally facilitating collaboration between the state, business and academic sector.

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<sup>44</sup> Nascia, L., and La Placa G. *RIO Country Report 2015: Italy*. Report no. EUR 27850 EN. Luxembourg: Publications Office, 2016: 45.

<sup>45</sup> Jacob, M., Å. L. Dahlstrand, and M. Sprutacz *RIO Country Report 2015: Sweden*. Report no. EUR 27859 EN. Luxembourg: Publications Office, 2016: 54-55.

<sup>46</sup> "About Sisp." Swedish Incubators & Science Parks. 2016. Accessed May 4, 2017. <http://www.sisp.se/about-sisp?Language=en>.

The leading tool for financing newly created innovative companies in Finland is *Young Innovative Companies Programme (YIC)* launched in 2008. The program is quite selective, since financing may be provided only to companies with significant international growth ambitions. Given that, the companies have been working for not more than 6 years in the market, although having proved viability of their business model. In terms of the program, a company may receive EUR 1.25 mln for implementing its project, covering 75% its total costsheet. The funds are provided in three tranches (two grant tranches by EUR 250 thousand and loan amounting to EUR 750 thousand). Each tranche is provided only upon compliance with mandatory criteria on every stage. As of the beginning of 2015, 260 companies have been selected, of which 75 have passed all three financing stages<sup>47</sup>. Another effective tool for developing young innovative companies is *VIGO business accelerator programme* introduced in 2009 by Finnish financial agency *Teke*, the activities of which are related to involving combined governmental and private venture financing into new innovative business projects<sup>48</sup>. The program institutional model includes 9 companies being partners in the enterprises to the capital of which they contribute funds.

The Danish Innovation Fund contributes to activation of governmental and private partnership in strategic spheres of technological development, namely: "green technologies"; intelligent, sustainable and effective industrial production; experimental testing of new medicines; reduction of water consumption in industrial production; world class construction technologies etc<sup>49</sup>. In general, there are five scientific parks functioning in Denmark containing four business incubators. It is interesting to mention that these are mainly large Danish companies cooperating with national universities, while SMEs are more inclined to collaboration with foreign academic establishments<sup>50</sup>.

Dutch format of facilitating innovation-active enterprises. The most large-scale tool for facilitating innovations commercialization in the Netherlands is *Small Business Innovation Research (SBIR)* program launched by the Ministry of Economy of the Netherlands in 2004, inspired by its American predecessor. *SBIR* mission is to create the necessary conditions for SMEs in the sphere of developing innovative approaches to resolving key social problems and bringing innovative ideas to the market. The program fulfilment mechanism includes three

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<sup>47</sup> Halme, K., Saarnivaara V.-P., and Mitchell J. *RIO Country Report 2015: Finland*. Report no. EUR 27861 EN. Luxembourg: Publications Office, 2016: 75.

<sup>48</sup> Ibid.

<sup>49</sup> Christoph, Grimpe, and Mitchell Jessica. *RIO Country Report 2015: Denmark*. Report no. ; EUR 27845 EN. Luxembourg: Publications Office, 2016: 64.

<sup>50</sup> Ibid, p. 59.

phases. On the first stage, a tender is announced for state procurement of innovative solutions, products or services, and preliminary assessment of bids takes place. On the second stage of projects selection, the applicant companies should prepare prototypes of innovative product, service or process. Grants for executing the first two program stages are provided on complimentary financing conditions in the ratio 50% (state) to 50% (business). On the final third stage, the serial production and introduction of innovative solution to the market is carried out, with no state financing being provided for preparing serial production – state support may exist only in form of orders for the product<sup>51</sup>. The state acts as the buyer in 30% orders for precommercial innovative solutions<sup>52</sup>.

The *SME Innovation support for Top Sectors* program provides support to small innovative companies working in priority technological sectors. In 2013, the financing has comprised EUR 15 mln, in 2014 it has exceeded EUR 32 mln, in 2015 – EUR 50 mln, and in 2016 – EUR 55 mln<sup>53</sup>. As assessed by *The Enterprise Policy Monitor 2015*<sup>54</sup>, 90 % budget expenditure in 2014 has been directed for supporting collaborative research and development projects and testing projects market potential. The rest of funds have been used to support innovative networks, intermediary operations, innovative voucher programs and innovative contracts<sup>55</sup>.

In the Netherlands, the problem of encouraging innovative start-ups is resolved in quite democratic manner. In accordance with *StartupDelta* initiative terms, immigrants outside the EU are entitled to develop business plan and receive a starting capital for creating a business project in the country. Registration of enterprise in the Netherlands entitles the immigrant to receive country residence permission valid for two years (*Startup Visa* program)<sup>56</sup>. As rated by *Global Startup Ecosystem Ranking*, in 2015 this initiative have been included into TOP-20<sup>57</sup>. Another program, *Takeoff*, is oriented for supporting university spin-offs on different stages of their life cycle.

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<sup>51</sup> Janssen, M., B. Erven, P.D. Hertog, and K. Jonkers. *RIO Country Report 2015: The Netherlands*. Report no. EUR 27857 EN. Luxembourg: Publications Office, 2016: 54.

<sup>52</sup> "Voortgangsreportage innovatiegericht inkopen: innovaties versterken de inkoopkracht van de overhead, bijlage bij de voortgangsreportage Bedrijvenbeleid 2013 ." Rijksoverheid. 2013. Accessed May 4, 2017. <http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2013/10/02/voortgangsrapportage-innovatiegericht-inkopen.html>

<sup>53</sup> "Mkb-innovatiestimulering Regio en Topsectoren (MIT)." Mkb-innovatiestimulering Regio en Topsectoren (MIT) | RVO.nl. Accessed May 04, 2017. <http://www.rvo.nl/subsidies-regelingen/mkb-innovatiestimulering-regio-en-topsectoren-mit>.

<sup>54</sup> *Enterprise Policy Monitor 2015*. Report. Amsterdam: Ministry of Economic Affairs, 2015. 1-107..

<sup>55</sup> Janssen, M., B. Erven, P.D. Hertog, and K. Jonkers. *RIO Country Report 2015: The Netherlands*. Report no. EUR 27857 EN. Luxembourg: Publications Office, 2016: 25.

<sup>56</sup> "Residence permit for foreign start-ups." Residence permit for foreign start-ups | RVO.nl. Accessed May 04, 2017. <http://english.rvo.nl/subsidies-programmes/residence-permit-foreign-start-ups>.

<sup>57</sup> Startup Ecosystem Report 2015 Website (by Compass formerly the Startup Genome). Accessed May 04, 2017. <http://startup-ecosystem.compass.co/ser2015..>

Within 2004-2011, the subsidies provided have comprised EUR 19 mln, entailing incorporation of 47 successful start-up companies with aggregate annual turnover amounting to EUR 16.8 mln<sup>58</sup>. Other examples of start-ups support programs and innovative ideas commercialization in the Netherlands are: *Subsidy scheme Knowledge Exploitation* program (2005-2008) providing co-financing for shaping ideas market potential; *Startlife* program – microcrediting of innovations pre-start financing funds and individual students engaged in start-ups; *Technojump* program – collaborative platform in the Southern Netherlands uniting various aspects of innovation process and providing financial support; *Business angel program* – a network of business angels<sup>59</sup>.

### Conclusions

The research conducted on national policies of facilitating local innovative activity of the leading EU countries within 1999-2017 enables to conclude the following.

Firstly, the following have been the most powerful tools in terms of financial security: direct support of private R&D and innovative enterprises, cooperation development programs in scientific and research sphere, as well as competitive financing of academic establishments R&D.

Secondly, after the global financial crisis the issue of public support for innovative activity has become actual in the EU, reflecting in extending technologies commercialization mechanisms on final stages of their development, a share of which has been sustainable growing as compared with governmental programs focused on earlier stages of scientific and research projects.

Thirdly, within the investigated period, the tools for facilitating local innovative business activity have been diversified: alongside with long-term projects of collaborative governmental and private R&D and innovative science intensive clusters development initiatives, short-term tools, such as innovative projects vouchers and science intensive start-ups, have become quite wide-spread. Furthermore, together with traditionally developed toolkit for supporting SMEs, a range of European countries have made their direct financing programs equally available to large companies. Since 2014, this trend has been finally established also on supranational level in frames of *Frontier 2020*

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<sup>58</sup> Janssen, M., B. Erven, P.D. Hertog, and K. Jonkers. *RIO Country Report 2015: The Netherlands*. Report no. EUR 27857 EN. Luxemburg: Publications Office, 2016: 77.

<sup>59</sup> Ibid.



program, under which *InnovFin Large Projects* tool has appeared especially designed for innovation-oriented private companies.

Fourthly, the experience of European countries clearly demonstrates that even a brilliant super-modern concept of innovative policy is unable to ensure country high achievements in the sphere of innovative development, where the necessary level of scientific and technical potential and environment is absent, capable to impel national companies to intensify competitive and cooperative relations based upon implementing innovative strategies. Therefore, creation of effective country innovative development policy is a complicated and complex process requiring critical objective assessment of national innovative capability level, national innovative system condition (its strong and weak points), as well as the ways for integrating innovative policy into multilevel system of governmental regulation of social and economic progress of the country.

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