

POSSIBLE CONSEQUENCES OF BREXIT ON EUROPEAN PHARMACEUTICAL MARKET

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Abstract. Brexit has been a hot topic of discussions since the referendum held in June 23 2016; the long and difficult negotiations and multiple delays of the Brexit have caused uncertainty and confusion in pharmaceutical industry in both UK and EU. As EU pharmaceutical companies have been part of UK pharmaceutical market for decades and makes considerable contribution to UK's health system it is important to acknowledge what the Brexit might bring to the industry and how the company marketing strategies should be aligned to cope with the consequences caused by Brexit.

Purpose of the article: The purpose of the research is to assess the influence of Brexit on EU and UK pharmaceutical markets and industry in order to acknowledge potential risks, challenges for conducting marketing activities in UK pharmaceutical market after Brexit. The findings of this article could later be used by pharmaceutical industry professionals to better understand the Brexit influence on pharmaceutical industry and align their marketing strategy.

Objective: To assess the possible consequences of Brexit on UK and EU pharmaceutical markets and industry.

Methodology/methods: In order to attain the goal and objectives, the following quantitative and qualitative methods were used: meta and content analyses, analysis of the most recent scientific and professional literature available and in-depth interviews of industry experts. The study is based on scientific papers published by foreign scholars, general and special literature, periodicals, governmental and industry reports.

Findings: the research outlined the challenges that pharmaceutical industry is facing due to Brexit process; it also outlines the possible future challenges that industry might face in the future and outlines possible solutions that can be adapted in practice.

Keywords: *Pharmaceutical Industry, EU Pharmaceutical Market, Brexit, Pharmaceutical product availability.*

JEL code: M31

Introduction

As potential Brexit has brought confusion and uncertainty to the pharmaceutical industry in EU it is important to acknowledge the main issues that pharmaceutical companies willing to operate in UK will have to face when Brexit will take place. As pharmaceutical industry is one of the main industries in Latvia the research is focused on finding possible solutions and possible marketing strategies for companies that are willing to conduct business in UK pharmaceutical market.

The objective of the research is to study and assess the possible consequences and influence of UK leaving the EU on pharmaceutical industry in both EU and UK as well the possible challenges and opportunities that might arise after Brexit.

In order to achieve this objective, the research was based on the study of meta and content analyses, analysis of the most recent scientific and professional literature available, in-depth interviews with directors of Latvian, UK and Ireland Pharmaceutical companies and scientific literature databases were used as information sources.

Research shows that since Brexit vote has taken place it has caused a significant influence on UK pharmaceutical industry resulting in reduced development and postponed investments caused by uncertainty of possible Brexit scenarios. Both EU and UK's pharmaceutical companies will have to adapt their marketing and regulatory strategies in order to align with UK leaving the joint EU registration procedures. By outlining the major challenges

pharmaceutical industry could face the research authors hope the industry can adapt timely their strategies to better cope with these challenges and reduce Brexit negative consequences.

Literature Review

Publications of UK Medicines and Healthcare products Regulatory Agency, UK Parliament House of Commons and European Medicines Agency were used to reflect current political and regulatory processes concerning pharmaceutical industry.

Industry reports from Marketline and OECD were used to analyze the pharmaceutical market trends in EU and UK.

Articles from Journal of Pharmaceutical Policy and Practice, Forensic Science International, Expert Opinion on Drug Discovery, Medical Writing, The Pharmaceutical Journal, British Journal of Pharmacy and Journal of Pharmaceutical Policy and Practice, OECD Economic Policy Papers, Journal of Economic Perspectives and other related sources were used as information sources.

Multiple interview of experts in pharmaceutical field were conducted, including head of regulatory department of a Latvian pharmaceutical producer, managing director of a pharmaceutical distribution company in Ireland, business development and clinical affairs director of a pharmaceutical distribution company in UK and a business development director of a UK pharmaceutical producer.

The causes of Brexit taking place, its current influence on the UK's economy, investments and pharmaceutical industry have been assessed by multiple authors, as well as possible scenarios of post-Brexit development in both EU and UK have been outlined. It has been noted that possibility of Brexit has slowed down the UK's economic growth and caused uncertainty among investors and industry; whereas there's considerably less research been done on Brexit potential consequences on EU industries.

1. Brexit development and current influence

Brexit started as an innocent idea by UK's Prime Minister at that time David Cameron in early 2013 (January 23) in a speech at Bloomberg outlining the idea of UK resetting its role within EU. The innocent idea later turned into a dangerous flirt with the public that eventually led to a referendum on UK's possible withdrawal from EU (June 23 2016) (House of Commons, 2019).

The referendum resulted in tight vote with 51.9% voting to exit EU. The positive vote came as a negative surprise to UK and the global community – the voting outcome was later explained by social inequality caused by the globalization (Pettifor, 2016; Clarke, Goodwin and Whiteley, 2017; Colantone and Stanig, 2018). UK proceeded with its goal to exit EU and triggered the Article 50 of the Treaty on European Union in March 29 2017, thus formally starting the Brexit procedure.

Year 2018 continued with intense negotiations between EU and UK on the Brexit terms; in parallel the public started to prepare for a no-deal Brexit.

So far the possible Brexit and multiple delays of it taking place has brought concerns and uncertainty of UK's economies future and development – as per OECD reviews the chaotic Brexit development has impacted consumption, investments and the economic activity in UK (OECD, 2017).

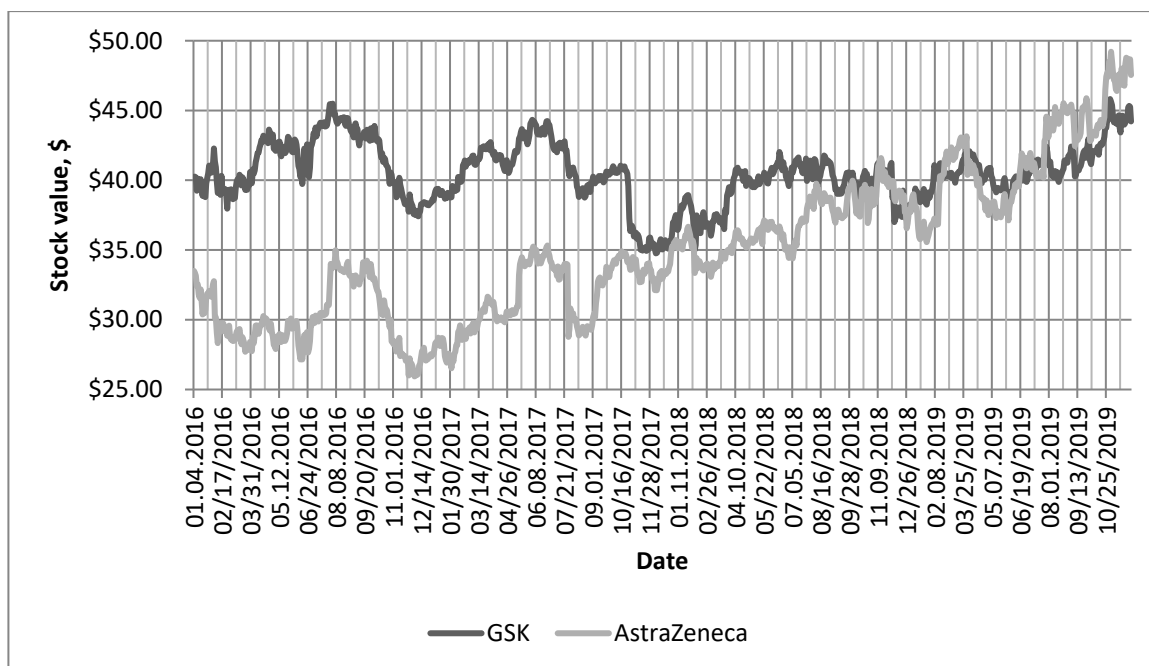
Due to uncertainty of Brexit, consumer and investment sentiment has slowed down since 2016 which impacted the economic growth rate of the UK – economic growth, which averaged 2.45% during 2013–2015, slowed down to an average of 1.67% during 2016–2018 (MarketLine, 2019). Some of researches even suggest that the uncertainty caused by Brexit is one of the major causes of the development slow down (Steinberg, 2019).

Brexit has also affected the development of the UK Pharmaceuticals market, and the future looks increasingly uncertain. The first major blow to the UK's pharmaceutical market came within a year after the referendum and the decision to proceed with Brexit when the European Medicines Agency announced its departure from the UK and

relocation to Amsterdam (MarketLine, 2019). This was a significant loss to UK's pharmaceutical industry, which over the years had developed a close cooperation between the EMA and the UK regulatory body (MHRA). Prior the Brexit referendum, due to its regulatory leadership, world-leading research base and well integrated National Health System, UK was the preferred option for European drug manufacturers who were seeking to register their pharmaceutical product in the European Market. The UK's leading role as preferred platform for pharmaceutical product registration boosted its economy and health system with investments, taxes, intellectual property filings and UK citizens gaining access to innovative drugs much faster than in other healthcare systems within Europe.

It has been noted that since 2016, Brexit has had a significant effect on investment caused by legislative and regulatory uncertainty that has resulted in the pharmaceutical industry being precautions to further investments in UK (MarketLine, 2019). Studies have outlined that since Brexit vote not only the investments in UK have reduced (by 11%), but also have had negative effect on UK industry productivity as it's top management has to focus their attention to post-Brexit scenario planning (Bloom et al., 2019).

Furthermore, authors of this study noticed some similarities in the stock value development of two major pharmaceutical producers in UK (GlaxoSmithKline and AstraZeneca) after the Brexit referendum taking place and being followed by inconvenient development of the Brexit process and multiple delays in UK actually leaving the EU (as shown in Figure 1 below). Although direct correlation between Brexit discussions and stock market value changes have not been approved the similarity in stock value trends could be explained by shifts of British Pound value (Breinlich et al., 2018).



Source: authors' calculation based on (NASDAQ Exchange, 2019)

Fig. 1 GlaxoSmithKline and AstraZeneca stock value changes (01.05.2016. – 10.25.2019.)

2.EU and UK Pharmaceutical market overview outlining future business opportunities

As per Marketline report of Europe pharmaceutical industry in 2019, the European pharmaceuticals market grew by 3.1% in 2018 to reach a value of \$286.9 billion. The compound annual growth rate of the market in the period 2014–18 was 2.6%. In comparison the Marketline report of UK's pharmaceutical industry in 2019, the pharmaceuticals market in UK grew by 3.9% in 2018 to reach a value of \$26.9 billion. The compound annual growth rate of the market in the period 2014–18 was 0.6% (as shown in Table 1 below).

Table 1

Europe and UK pharmaceuticals market value: \$ billion, 2014–18

Year	Europe		UK	
	€ billion	Growth, %	€ billion	Growth, %
2014	219.6		26.3	
2015	225.1	2.5%	27.0	2.7%
2016	228.2	1.4%	25.1	-7.0%
2017	235.6	3.2%	25.9	3.2%
2018	243.0	3.1%	26.9	3.9%
CAGR: 2014–18		2.6%		0.6%

Source: authors' calculation based on (MarketLine, 2019)

The reports also predicts that in 2023, the European pharmaceuticals market is forecast to have a value of \$344.5 billion, an increase of 20.1% since 2018. The compound annual growth rate of the market in the period 2018–23 is predicted to be 3.7%. In comparison the UK's pharmaceuticals market is forecasted to have a value of \$32.1 billion in Year 2023, an increase of 19.3% since 2018. The compound annual growth rate of the market in the period 2018–23 is predicted to be 3.6% (as shown in Table 2 below).

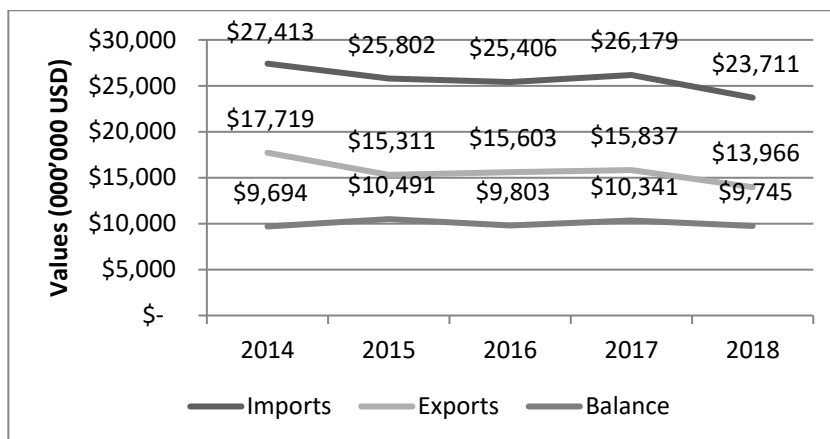
Table 2

Europe and UK pharmaceuticals market value forecast: \$ billion, 2018–23

Year	Europe		UK	
	€ billion	Growth, %	€ billion	Growth, %
2018	286.9	3.1%	26.9	3.9%
2019	296.5	3.3%	27.8	3.3%
2020	306.9	3.5%	28.8	3.6%
2021	318.3	3.7%	29.8	3.5%
2022	330.8	3.9%	30.9	3.7%
2023	344.5	4.1%	32.1	4.0%
CAGR: 2018–23		3.7%		3.6%

Source: authors' calculation based (MarketLine, 2019)

As noted by OECD report on international trade 2019, UK is historically importing pharmaceutical products from EU27 in a greater value than it is exporting to these markets. Balance of pharmaceutical import and export from UK to EU27 balances in between of 9,7\$ billion and 10,5\$ billion in favor of EU27 during Years 2014-2018 (as shown in Figure 2 below).



Source: authors' calculation based on (OECD, 2019)

Fig. 2 Import, export values and balance of UK pharmaceutical products to EU27

Market data shows that while EU pharmaceutical market has a steady development trend, UK has had a significant decrease (-7%) on pharmaceutical market in Year 2016 that could be linked to inconvenience caused by possible Brexit. The compound annual growth rate in next 4 Years for both UK and EU pharmaceutical markets is expected to be similar (3.6% - 3.7%) with EU having slightly better expectations. The decline and weakened growth in UK market and industry has been noted by multiple reports and linked to uncertainty of UK future after Brexit taking place (OECD, 2016).

The pharmaceutical product import and export trends in UK market shows that UK is quite dependent on product supplies from EU. The possible Brexit brings opportunities for both – UK companies to take greater domestic market share, thus reducing import value from EU; and for EU pharmaceutical producers Brexit brings opportunities for those who are flexible enough to align with complex and unpredictable UK's post-Brexit market to bypass companies that will no longer supply their products to UK.

Also, it has been outlined by multiple researches that Brexit will cause a slower growth in UK that it would have been if it remained in EU (Sampson, 2017). The trade relations and environment is expected to worsen after Brexit taking place would cause negative effects for both UK and EU and also other major countries worldwide; a trade agreement between EU and UK would reduce the negative consequences of Brexit (Brakman, Garretsen and Kohl, 2017), (Morley, 2019).

Although most of the reviewed studies predict that Brexit would bring loss to the UK's economy, it is stipulated that Brexit could bring some advantages to UK if the trade policies and negotiations are played out smart, especially in the fields where UK has high imports of intermediate products and low exports of final goods to the EU, by increasing the local value of the final goods (Felbermayr, 2019).

As described by studies focusing on turbulent market situations, the changing market situation, as it is with Brexit, might draw concerns to enterprises asset quality and profitability, thus pushing enterprises to optimize their asset and liability structure in order to reduce financial risks and remain profitable (Saksonova, 2013).

Also, in order to reduce the influence on Brexit caused negative risks the enterprises should review their development and marketing strategies (Saksonova and Solovjova, 2012) and enterprises might favor merging and acquiring strategies even more to increase the enterprises competitiveness and industry development (Saksonova and Kantane, 2017).

Thus the Authors see a probability that due to Brexit the UK pharmaceutical companies may tend to choosing the path of merging and acquiring to enhance their competitiveness in the UK and EU market.

3.Regulatory differences of Pharmaceutical product registration (EU vs. UK) and their influence on pharmaceutical market development

Pharmaceutical product registration is a mandatory and complex regulatory process that is required prior products can be introduced in corresponding markets. Same as with uncertainties with economics development due to possible Brexit the regulatory processes faces similar concerns. Although no radical changes in the EU policies have been made so far, it is expected that EU policies could become less liberal in the future (De Ville and Siles-Brügge, 2019). In parallel, it is noted by regulatory experts that EU and UK producers are already facing with multiple difficulties and foresee possible regulatory trends and challenges in post-Brexit scenario.

It is expected that pharmaceutical product registrations for UK market that have been submitted within EU joint registration procedures will automatically be transferred to UK's National registration procedure, thus the registration finalization of the product in UK becomes less predictable.

After Brexit taking place the joint EU procedures where UK is acting as Reporting Member State (RMS) the pharmaceutical producers will have to choose different RMS country, thus increasing the workload of National Competent Authorities Regulatory expert workload in such member states.

The National registration procedure timelines in UK are quite similar to the ones set in the EU joint registration procedures, but there is doubt that the timelines will remain the same after Brexit as MHRA experts will have to assess the registration documentation independently, without direct assistance from other EU competent authority experts as it would be during joint EU registration procedures. Furthermore, due to higher input from its regulatory experts, MHRE is expected to face need in increasing its regulatory staff.

Regulatory experts outlined the advantage of National registration procedure (in comparison to EU joint registration procedures) by noting that assessment doesn't have to be aligned and approved by other Concerned Member States (CMS). Nonetheless such approach requires additional effort for both the National Competent authority and pharmaceutical producer as in general it runs as an independent registration procedure that requires almost the same effort as the joint registration procedure.

As disclosed by regulatory experts, due to uncertainty with the Brexit timelines (as it has been postponed multiple times), there has been situations where a joint registration procedure RMS would reject adding UK as a CMS if the joint procedure would end after the initially set Brexit deadline, thus confusing pharmaceutical producers on choosing the right strategy for pharmaceutical product registration in UK. Also, there have been situations when MHRA would reject the pharmaceutical product registration submission if the product has an ongoing joint registration procedure in EU – the pharmaceutical producer would then be suggested to include UK as CMS in the joint procedure in despite of the previously mentioned concerns set by the RMS.

Majority of experts during their interviews noted that pharmaceutical product applications that have been submitted for National registration in UK in Year 2019 so far have considerably slower progress if compared to EU joint registration procedure and the feedback from MHRE has been slow despite the proactive communication and initiative from the submitter's side. They also noted that in some cases while the application of pharmaceutical product registration has been submitted in parallel in both EU joint and UK National registration procedures, the EU joint procedure has been finalized first while the UK national procedure still continues, thus showing an example that joint registration procedures can run more smoothly and convenient.

After the Brexit taking place and having no alternative joint registration procedure with EU, the pharmaceutical producers will have no other option than to submit the pharmaceutical products for registration in EU and UK independently, thus running two registration procedures instead of one joint procedure. This also increases the workload for both the producer and the MHRA.

From a pharmaceutical producers point of view the National registration fees in UK are higher (although insignificantly) if compared with applied fees for EU joint registration procedures (as shown in Table 3 below).

Table 3

UK pharmaceutical product registration fee comparison – decentralized vs. national registration

	Major	Abridged complex	Abridged standard	Abridged simple
National fee (including hybrid applications)	£ 92,753	£ 25,643	£ 9,402	£ 2,564
Decentralised procedure where the UK is a concerned member state (CMS)	£ 89,556	£ 24,760	£ 9,078	£ 2,564
Incoming mutual recognition with the UK as a CMS and European reference products	£ 62,421	£ 17,330	£ 6,350	£ 2,564

Decentralised procedure where UK is RMS	£ 121,664	£ 35,634	£ 15,659	£ 8,105
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Source: author's construction based on (Medicines & Healthcare products Regulatory Agency, UK, 2019)

Additionally this would exclude the option for UK to have a common/ joint packaging with other EU member states that require the products in English language (Ireland and Malta). As Ireland and Malta both have significantly smaller pharmaceutical markets in volume (compared with UK) the probability that pharmaceutical producers would decide to waive the registration of these pharmaceutical products in these member states increases.

Nonetheless, as pharmaceutical products that have approved English packs are highly demanded in use outside English speaking countries (due to widespread use of English language worldwide) and the products that are approved via joint EU registration procedures are well received worldwide (due to high regulatory and quality standards in EU), after Brexit the pharmaceutical producers could be tempted to reconsider registration of their pharmaceutical products in the remaining English speaking EU member states (Ireland and Malta) despite the low pharmaceutical market volume in these countries.

4. Possible supply issues of pharmaceutical products after Brexit

The uncertainty that comes with the possible Brexit and the way how the negotiations between UK and EU have been progressing causes concerns within the pharmaceutical producers and distributors both in UK and EU.

As reported by Marketline reports, in the situation of a no-deal Brexit the UK would lose preference in the EU markets, and the loss would amount to almost US\$16bn, which is equivalent to approximately 7% of the overall exports to the EU, according to UNCTAD estimates that had taken into account only the increase in the tariffs. Moreover, border controls, disruption of production networks and the non-tariff barriers are expected to add to the losses (MarketLine, 2019).

With respect to notes made by experts the pharmaceutical producers and distributors in EU and UK are currently facing with multiple difficulties and foresee possible pharmaceutical market development trends in post-Brexit scenario.

UK pharmaceutical producer representative remarked that possible Brexit brings a huge damage to European trading environment, brings losses to UK economy, lowers the access to foreign markets and makes no economic sense whatsoever. It has also been noticed that some UK pharmaceutical producers have already transferred some of their marketing authorizations of pharmaceutical products to their EU based entities in order to remain part of the EU joint market and avoid possible negative consequences caused by Brexit. Such regulatory actions require extra financial and regulatory resources that could be invested elsewhere. Also, UK producers are stocking up their products in order to cope with possible pharmaceutical product shortages that might come after Brexit takes place. As the Brexit date has been postponed already 3 times, the stocked up goods are seen as frozen assets that could be preferably used elsewhere, furthermore the shelf-life of the stocked goods is running, thus increasing the risk of product spoiling.

Both experts from UK pharmaceutical producers and distributors have noticed an increasing tendency of pharmaceutical product shortages in UK market. The increasing pharmaceutical product shortages could be explained by the lack of certainty what could happen after Brexit taking place and when could it actually happen (as it been already postponed multiple times). In some cases the pharmaceutical products in shortage are being replaced with other products and therefore patient therapies need to be adjusted accordingly. This further increases the consumption of replacing pharmaceutical products that eventually might result in further shortages as these pharmaceutical producers haven't expected such increase in demand of their products.

Furthermore, EU pharmaceutical producers noted that they are putting on hold their further investments into UK market (new research facilities, production sites, pharmaceutical product registrations, etc.) due to high uncertainty caused by possible Brexit.

So far both UK pharmaceutical producers and distributors experts haven't noticed any major shifts in the workforce availability, still it is expected that there will be increasing demand for highly qualified personnel, especially in the pharmaceutical regulatory field as it is expected that MHRA will need extra experts to cope with increasing numbers of pharmaceutical product National registration procedures and any producer that is expecting to register products in both EU and UK will need extra regulatory workforce to run both registrations in parallel. Nonetheless it has been observed that there has been a decrease in immigration in UK that can be explained by uncertainty caused by Brexit as potential immigrants from EU are not sure of their future within UK in case of a no deal Brexit. Also, as suggested by Marketline report of UK's pharmaceutical industry in 2019, the UK's research industry benefits significantly from European labor – life science PhD's and Postdoctoral positions in particular. Thus, by Brexit taking place there's a risk that it might cause damage to UK's life science knowledge base (MarketLine, 2019).

Both UK pharmaceutical producer and distributor experts indicated that at this stage it is hard to predict how Brexit could influence the competitiveness of UK pharmaceuticals producers as it only will be clear when a trade agreement between UK and EU would take place. Experts suggest that the uncertainty caused by multiple delays of Brexit and how it will take place causes more damage to the UK rather than potential Brexit itself. It is speculated that Brexit will bring loss to UK economy in a short term, but it's hard to predict how it will effect UK in a long run.

As noted by expert from UK pharmaceutical distributor the no deal Brexit would be the worst case scenario as there's no "safety net" in this situation and lots of processes could be put on hold, especially logistics and movement of goods over EU-UK border. This could result in uncomfortable situation for Ireland as it is somewhat dependent on goods transit via UK and it brings doubts that Ireland logistic infrastructure could fully cope with alternative logistic routes (direct air and sea transport from continental Europe) (BBC, 2018).

Furthermore, as noted by Ireland pharmaceutical distributor Ireland pharmaceutical market is much dependent on UK affairs as both countries commonly use unified packs for pharmaceutical products registered via same EU joint registration procedure and Ireland could usually be supplied with pharmaceutical products destined for UK market. Now if Brexit takes place and there will be separate registration procedures for Ireland and UK this option won't be possible. Also, UK pharmaceutical companies are putting on hold their regulatory, business development and investment activities in Ireland due to uncertainties caused by possible Brexit. Furthermore, Ireland pharmaceutical distributors supplying pharmaceutical products from UK are faced with negative financial consequences caused by changes in exchange rates of British Pound and Euro that came after initiation of Brexit discussions.

Irish pharmaceutical companies that are willing to develop business in UK now are forced to proceed with extra caution as UK economic is unpredictable due to uncertainties caused by potential Brexit.

Pharmaceutical distributors in Ireland have been preparing for initial Brexit term and possible pharmaceutical product shortages that might come by filling in their stock with extra quantities of the products, but as the Brexit was postponed the products are now stacked in warehouses with shelf-life slowly expiring; the companies have made useless investments and have frozen their assets that could be used elsewhere.

As suggested by experts, Ireland pharmaceutical distributors are tending to look for supplies of pharmaceutical products from other EU countries in order to reduce their dependency on UK producers. Suppliers that can deliver the products via air or sea route are preferred as in such case they can avoid the possibility that products will have to be shipped via UK where the movement of goods would be slowed down by customs and logistic costs increased due to possible tariffs.

It is expected by experts of Ireland pharmaceutical industry that HPRA will adjust to pharmaceutical market situation caused by Brexit and will be more flexible on requirements for pharmaceutical product packages so they can

be combined with other EU markets (dual language packs) thus increasing interest for pharmaceutical producers to register and supply products to Ireland.

Conclusions, proposals, recommendations

1. The uncertainty and confusion caused by potential Brexit and multiple delays of it taking place has made an impact on UK's economic growth that has slowed down to an average of 1.67% during 2016–2018. UK's pharmaceutical market experienced a decline by 7% in Year 2016 and have returned to its previous value in Year 2018.
2. Since 2016 Brexit has had a significant effect on investments in pharmaceutical industry caused by legislative and regulatory uncertainty – the pharmaceutical industry has become precautions to further investments in UK. Further investments in the industry could be expected when the Brexit actually takes place and it will be certain of how UK's trade relationships with EU will be handled.
3. After initiating the discussions of possible Brexit there has been confusion and uncertainties on how the pharmaceutical product registration will be processed in UK. Pharmaceutical companies willing to register their products in UK will have to align their regulatory strategy and apply for UK National registration (instead of using EU joint registration procedures). It is expected that pharmaceutical product registration timelines in UK will naturally increase and cause additional burden to both pharmaceutical industry and MHRA.
4. Pharmaceutical companies that are willing to have their pharmaceutical products registered in EU with approved English pack will no longer have the option to register the products in UK via joint European registration procedures. EU pharmaceutical companies should reassess their marketing strategies and consider registering their products in Ireland and/ or Malta as an alternative, thus also increasing the variety of pharmaceutical products available in these EU markets.
5. Although no issues with workforce availability in pharmaceutical field has been noticed so far, it is expected that after Brexit takes place there will be increased demand in regulatory experts in both private and public field. Additionally, it is expected that immigration of highly educated specialists from EU will decline, thus lowering the potential scientific capacity of UK's pharmaceutical research industry. While EU pharmaceutical companies could take advantage of this situation and encourage these specialists to stay/ return in EU and contribute to development of EU pharmaceutical industry.
6. Possible Brexit and multiple delays of it taking place have caused increased supply issues of pharmaceutical products in UK. This brings opportunities for pharmaceutical companies that are flexible enough to align their marketing strategies to complex and unpredictable UK's pharmaceutical market.
7. It is concluded that uncertainty caused by multiple delays of Brexit and how it will take place causes more damage to the UK rather than potential Brexit itself. It is suggested that politicians resolve the issue at the earliest convenience so pharmaceutical companies can proceed with developing long term marketing strategies to align with UK's post-Brexit pharmaceutical market.
8. Further observations and studies are recommended to be conducted on the EU and UK's pharmaceutical market and industry after the Brexit takes place in order to evaluate the effect it has actually conducted on these fields.

Bibliography

BBC News, 2018. Reality Check: The Brexit challenge for Irish trade. [Online] Available at:

<https://www.bbc.com/news/uk-politics-44657460> [Accessed 05.12.2019].

Bloom, N., Bunn, P., Chen, S., Mizen, P., Smietanka, P. Thwaites, G., 2019. The Impact of Brexit on UK Firms. SSRN Electronic Journal.

Brakman, S., Garretsen, H. Kohl, T., 2017. Consequences of Brexit and options for a 'Global Britain'. Papers in Regional Science.

- Breinlich, H., Leromain, E., Novy, D., Sampson, T., Usman, A., 2018. *The Economic Effects of Brexit: Evidence from the Stock Market*. Fiscal Studies, Wiley.
- Clarke, H.D., Goodwin, M., Whiteley, P., 2017. *Brexit Why Britain Voted to Leave the European Union*. *Brexit Introduced*, 1, 1-10.
- Colantone, I., Stanig, P., 2018. Global Competition and Brexit. *American Political Science Review*. 112(2), 201-218.
- De Ville, F., Siles-Brügge, G., 2019. The Impact of Brexit on EU Trade Policy. *Politics and Governance*, 7(3), DOI: <http://dx.doi.org/10.17645/pag.v7i3.2102>.
- Felbermayr, G.J., 2019. Brexit: A Hard-but-Smart Strategy and Its Consequences. *Intereconomics*. 54(3), 178-183.
- Fraser, J., 2017. Brexit – What are the potential consequences for pharma patents and SPCs?. *British Journal of Pharmacy*. , doi: <https://doi.org/10.5920/bjpharm.2017.06>.
- Golding, B.T., Waring, M.J., 2018. *The consequences of ‘Brexit’ for drug discovery and development, and the regulatory implications*. *Expert Opinion on Drug Discovery*, Taylor & Francis.
- House of Commons, 2019. *Brexit Timeline: Events Leading to the UK’S Exit From The European Union*. The House of Commons Library.
- Kazzazi, F., Pollard, C., Tern, P., Ayuso-Garcia, A., Gillespie, J., Thomsen, I., 2017. Evaluating the impact of Brexit on the pharmaceutical industry. *Journal of Pharmaceutical Policy and Practice*. 10(32), <https://doi.org/10.1186/s40545-017-0120-z>.
- Marketline, 2019. *Pharmaceuticals in Europe*. [Online] Available at: <https://www.marketline.com/> [Accessed 05.12.2019].
- Marketline, 2019. *Pharmaceuticals in the United Kingdom*. [Online] Available at: <https://www.marketline.com/> [Accessed 05.12.2019].
- Marketline, 2019. *The United Kingdom In-Depth PESTLE Insights*. [Online] Available at: <https://www.marketline.com/> [Accessed 05.12.2019].
- Morley, B., 2019. *The Economic Consequences of Brexit: A brief overview of the literature*, *Routledge handbook of EU security law and policy*. Routledge.
- NASDAQ, 2019. *Astrazeneca PLC Common Stock (AZN) Historical Data*, Database of NASDAQ. [Online] Available at: <https://www.nasdaq.com/market-activity/stocks/azn/historical> [Accessed 05.12.2019].
- NASDAQ, 2019. *GlaxoSmithKline PLC Common Stock (GSK) Historical Data*, Database of NASDAQ. [Online] Available at: <https://www.nasdaq.com/market-activity/stocks/gsk/historical> [Accessed 05.12.2019].
- OECD, 2016. *The Economic Consequences of Brexit: A Taxing Decision*. [Online] Available at: <http://www.oecd.org>. [Accessed 05.12.2019].
- OECD, 2017. *Economic Surveys: United Kingdom*. [Online] Available at: <http://www.oecd.org>. [Accessed 05.12.2019].
- OECD, 2019. *International Trade by Commodity Statistics, Volume 2019 Issue 2: Finland, Greece, Iceland, Portugal, Sweden, United Kingdom*. [Online] Available at: <http://www.oecd.org>. [Accessed 05.12.2019].
- Pettifor, A., 2017. Brexit and its Consequences. *Globalizations*, 14(1), 127-132.
- Rogers, D., Rogers, B., Lewis, J., Lewis, E., 2018. The UK pharmaceutical industry braces for Brexit, be it mild, severe, or doomsday. *Medical Writing*, 27(4), 41-45.
- Saksonova, S., 2013. Approaches to Improving Asset Structure Management in Commercial Banks. *Procedia Social and Behavioral Sciences*, 99, 877-885.

- Saksonova, S., Kantane, I., 2017. Mergers and Acquisitions: Examples of Best Practice in Europe and Latvia. *Contemporary Studies in Economic and Financial Analysis*, 98, 95 – 110.
- Saksonova, S., Solovjova, I., 2012. Some Quantitative Aspects of Stability Management Strategy in a Bank. *Procedia Social and Behavioral Sciences*, 58, 569 – 577.
- Sampson, T., 2017. Brexit: The Economics of International Disintegration. *Journal of Economic Perspectives*. (4), 163-184.
- Steinberg, J.B., 2019. Brexit and the macroeconomic impact of trade policy uncertainty. *Journal of International Economics*. 31(4), 163-184.
- Wilson, T.J., 2019. The impact of Brexit on the future of UK forensic science and technology. *Forensic Science International*, 302, 109870.