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Towards a Meta Cost-benefit Analysis: The Case of Brexit

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Doubtless Brexit is one of the most important regulatory challenges for an entire country since the beginning of the twenty-first century. Equally important are the implications, in terms of costs and benefits, of this democratic decision for the UK's economy and for its regulatory environment. So far, some cost-benefit analyses have attempted to measure the post-Brexit situation. Few studies have proposed a 'meta cost-benefit analysis', which would encompass current studies into one aggregated study. No study has provided for a meta cost-benefit analysis as the Brexit negotiations unfold and which provides for a comprehensive discussion of the regulatory issues at stake. This article intends to fill this gap.

The originality of this article lies in both its content and its timing. The content is original because it discusses the scientific possibility of a meta cost-benefit analysis of Brexit together with the inherent limits associated with such an endeavour. The timing is appropriate as we are in the critical halfway point of the two-year negotiation period (2017-2019) during which the EU and the UK must secure the relevant deals to ensure a smooth and frictionless Brexit for both sides of the Channel.

Keywords: Brexit, cost-benefit, meta analysis, regulation, United Kingdom

I Introduction

"The British should know this, they know this already, that it will not be at a discount or at zero cost. The British must respect commitments they were involved in making. So the bill will be, to put it a bit crudely, very hefty," stated Jean-Paul Juncker, the President of the European Commission, on Tuesday February 21, 2017 before the Belgian Federal Parliament.[2] On June 23, 2016, in a national referendum, the British people voted 51.9 percent in favour of leaving the European Union (the so-called "Brexit", as coined by Peter Wilding[3]).

Whereas the referendum on Europe was meant to lead to the strengthening of the UK's membership inside the European Union,[4] it eventually led to the passing of the Great Repeal Bill,[5] according to which the UK shall, altogether, i) repeal the European Communities Act of 1972, which enabled membership of the UK in the EU, and ii) transpose all of existing EU law (or *acquis*) into UK domestic law.

After having notified the EU of its willingness to withdraw from it,[6] the UK has a two-year period in which to negotiate three separate but *inter-related* deals,[7] which are the following:

i.) ending of the current relationship (and liabilities) with the EU, the so-called EU divorce bill; prerequisite to,[8]
ii.) a transitional arrangement allowed by Article 50[9] of the Treaty on the Functioning of the European Union (TFEU); tied up with,[10]
iii.) a new regulatory relationship with the EU.[11]

This so-called EU divorce bill shall come as an extra cost of the trade deal that the United Kingdom will seek to secure with the European Union once it will have exited it. Consequently, the costs and benefits of Brexit to be envisaged are two-fold: the Brexit Bill and the potential trade deal.

Any potential trade deal has to be secured within the two-year period mandated by Article 50 of the TFEU after the UK has formally notified the European institutions of its willingness to exit the EU. Such formal notification can only triggered by the UK government once both Houses of the Parliament have voted to exit the EU. (The referendum which took place on the 23rd of June 2016, whereby the British people expressed the desire to leave the EU, has no legal valence, as recently confirmed by the UK Supreme Court, but only consultative valence as provided by the Referendum Act).

This procedural precision has tremendous impact in terms of the measurability of costs and benefits of the Brexit for the UK economy. Indeed, the procedure implies that the UK Government must have the consent of the UK Parliament on the final proposed trade deal in order to ratify it, in addition to the consent of the 27 other member states' parliaments and the European Parliament. This procedural cumbersomeness undoubtedly leads to increased costs due to uncertainty associated with the possibility of minority veto, and therefore increases the probability of no trade deal at the end of the negotiation period. If the clock is ticking from both perspectives – the European one and the UK one – it seems that the clock is ticking much more loudly on the British side of the Channel. This time constraint shall inevitably impact upon the overall measurement of the costs and benefits of Brexit.

The measurement of the costs and benefits of Brexit for the UK economy is such a complex undertaking that current studies lead to very conflicting results. The *Financial Times*'s verdict is that "with clear and easily specified economic risks in the short and medium-term, Brexit does not easily pass any cost-benefit analysis" (*Financial Times*, 2016). Earlier, the House of Commons Library (Harari and Thompson, 2013) rightly foresaw that "there is no definitive study of the economic impact of the UK's EU membership, or equivalently, the costs and benefits of withdrawal. Framing the aggregate impact in terms of a single number, or even irrefutably demonstrating that the net effects are positive and negative, is a formidably difficult exercise."

Be that as it may, the UK Treasury had anticipated, in early 2016, that should the British people vote for Brexit, it would amount to an "immediate and profound economic shock creating instability and uncertainty which would … push the UK into recession and lead to a sharp rise in unemployment."[12] Although not 'immediate and profound', the short-term consequences of Brexit are yet to be discovered, as the UK will officially leave the EU only in March 2019. The true costs and benefits of Brexit shall be experienced from that time onwards.

Despite the inherent difficulty of this 'rare phenomenon' of 'economic disintegration',[13] the number of studies that have recently tried to cost Brexit out shall enable us to provide a meta analysis which gathers the main findings. If every cost-benefit analysis (CBA) so far has envisaged the potential trade deal the UK might strike with the EU, every study has nevertheless ignored to take into account the Brexit Bill the EU will present to the UK as a prerequisite to entering into trade negotiations. This pitfall shall be avoided here, and the most comprehensive picture of the costs and benefits of Brexit shall be delivered thanks to a simple meta analysis.

Our endeavour is to review the current CBAs of Brexit and provide guidance for a potential meta CBA[14] in the near future, when calculations will begin to become more realistic as negotiations post–Article 50's notification proceed further. There are very few meta CBAs of Brexit. This article intends to provide further guidance and polish for potential meta CBAs applicable in the case of Brexit.

II Towards a Meta Cost-benefit Analysis of Brexit

The different attempts to carry out a CBA of the consequences of Brexit for the UK economy have largely tried to estimate the costs and benefits for the UK after its their dubious perspectives on the hypothetical costs and benefits that the UK would incur once it has secured a yet unknown deal with the EU. These CBAs are forward-looking, as they speculate on the probable deal to be struck between the UK and the EU. They try to anticipate the respective costs and benefits of leaving the EU without necessarily taking into proper consideration the time variable and the spillover effects of the UK's membership in the EU. For such membership does not generate annual benefits but rather exponentially yields benefits (and costs) that are hardly quantifiable. Be that as it may, we shall provide a literature review of the SCBAs before discussing the more appropriate method of inferring costs and benefits of Brexit.

1. Pitfalls of Speculative Cost-benefit Analyses

Indeed, SCBA requires academics to speculate on the different possible post-Brexit regulatory arrangements that will be agreed by the UK and the EU. SCBAs must engage in speculation about whether or not the UK will embrace, once out of the EU, a deregulatory free-trade path or a more protectionist path. The most credible options for the UK are the following:

i.) the Norwegian option of membership in the European Economic Area (EEA);

ii.) the Swiss option of tailor-made bilateral agreements with the EU;

iii.) the Canadian option of a comprehensive trade deal with the EU; and

iv.) the World Trade Organization option as the 'no deal' defaulting option.

Table 1 sketches out the available options in light of the prime minister's Lancaster House Speech.[15] This table portrays the rather demanding requirements laid down by Prime Minister Theresa May for dismantling the highly interdependent relationship that the UK currently enjoys with the EU. Indeed, the options that have the most probable fit with the Lancaster Speech's requirements are either the 'Canada option', or the 'WTO option' in the case of no deal. Indeed, it is our contention to foresee that none of the other abovementioned options shall be selected for the post-Brexit regulatory arrangement between the UK and EU.

Table 1 Available Options for Post-Brexit's UK

	PM's Lancaster House speech	**Stay in the single market but leave the customs union**	**Leave the single market but negotiate a customs union**	**Leave the single market and customs union but negotiate a bilateral trade agreement**			**Leave the single market and the customs union with no deal**
		Norway	*Turkey*	*Switzerland*	*Ukraine*	*Canada*	*WTO option*
Control migration from the EU	✓	X	✓	X	X	✓	✓
End the jurisdiction of European Court of Justice	✓	partial	mostly	mostly	partial	✓	✓
End applicability of EU regulations	✓	X	partial	partial	very limited	✓	✓
Pursue an independent trade policy	✓	mostly	very limited	mostly	✓	✓	✓
Stop obligatory budgetary contributions to the EU	✓	X	✓	X	✓	✓	✓
Exit CAP and CFP	✓	✓	✓	✓	✓	✓	✓
Trade–free trade with the EU	✓	✓	✓	✓	✓	✓	X
Access to the EU single market for services	✓	✓	X	very limited	✓	very limited	X
Seamless and frictionless border for services	✓	partial	partial	partial	partial	X	X
Voluntary participation in EU programmes	✓	✓	✓	✓	✓	partial	X
Speed of negotiation (within Article 50 process)	✓	✓	✓	X	X	X	N/A

Source: Institute for Government, July 2017.

Indeed, the Norwegian option is unrealistic, as this presupposes that the UK has the willingness to financially contribute to EU common policies as required of EEA member states. The UK has no willingness to pay for securing access to the single market (UK Government, 2017:49). Most importantly, single market rules would imply submission to the jurisdiction of the EFTA Court.[16] Also, because the UK seeks "establishing an independent international trade policy",[17] the Norwegian option is not the desirable one for the UK given its thirst for trade independence.

The second option, the Swiss regulatory arrangement, is strictly unthinkable in the UK situation. Switzerland, a member of the EFTA but not of the EEA, has limited access to the free provision of services whereas the strength of the UK service economy (financial and insurance sectors) would require full access to the single market for UK service providers. On the other hand, Switzerland has free movement of persons whereas the essence of the Brexit debate requires the UK to control immigration (Anorsson and Zoega, 2016:5). Finally, Switzerland contributed increasingly to the EU budget (257 million Swiss francs) in return for access to the single market, a not-envisaged option for the UK.

The Canadian option could be an appropriate option for the UK given its vision for post-Brexit Britain. Indeed, the Canada-EU trade agreement seems to be the regulatory arrangement that is the most strictly aligned with Theresa May's specific wishes as outlined in her Lancaster House Speech.[18] The EU-Canada Comprehensive Economic and Trade Agreement (CETA), signed between the EU and Canada in 2016, provides for a removal of 99 percent of customs duties on European exports (agricultural and industrial products only) to Canada and Canadian exports to the EU after a seven-year transition period. Businesses from the EU and Canada shall be able to bid for public contracts in one another's jurisdiction. There is no free provision of services in CETA, whereas 80 percent of the UK economy is made up of services, and the UK financial industry enjoys 'passporting rights'[19] across the EU. Regulatory barriers between Canada and the EU remain in CETA and, thus, market access to the EU single market is very limited.

Consequently, despite being a solution that fits some of the political requirements she laid down (no contributions by the UK to the EU budget, no jurisdiction of the European Court of Justice over UK law, etc.), Theresa May argued that, in reference to CETA, "we can do much better than this" and that neither a European Economic Area membership nor a free trade agreement such as the EU-Canada one is desirable.[20] A tailor-made agreement not based on existing models seems clearly to be favoured by the UK, as outlined by Prime Minister Theresa May in her Florence Speech.

Finally, the WTO option is undesirable for both the UK and the EU, as this default solution would imply the loss of the benefits associated with free trade deals. However, be it undesirable, this option may not be implausible. Indeed, the "government is clear that no deal for the UK is better than a bad deal for the UK."[21] WTO rules require countries to apply to each other the same tariffs and other trade restrictions they apply with the rest of the world, unless a bilateral trade agreement between the EU and the UK is signed. Absent such a deal, free movement of goods will be hampered due to new tariffs inasmuch as free provision of services will be restricted because WTO rules allow for little liberalisation of services, which make up approximately 80 percent of the UK economy. Consequently, under WTO rules only, both sides, the EU and the UK, will be harmed by greater costs in the provision of UK services to the Continent and by greater costs of exporting EU products into the UK. The signing of a tailor-made bilateral trade agreement shall therefore be the objective of the current two-year negotiation period between the UK and the EU, once the EU divorce bill and transitional agreement have been secured.

In order to assess the potential costs and benefits of a future bilateral trade deal, the literature has so far had recourse to SCBAs, allowing for some approximate figures on the future situation of the UK after an exit from the EU. SCBAs are forward looking studies which are contestable since "there is no universally accepted forward looking method of estimation available to integrate all of these specific effects in a comprehensive way."[22] Despite having this hypothetical outlook for the potential future of the UK economy outside the EU, these attempts bear some relevance and shall therefore be now reviewed.

Baker et al. (2016) assessed that the short-term GDP impact on the UK economy would be -1.9 percent for an EEA option, -2.1 percent for a Swiss option, and a loss of GDP of 2.9 percent for the WTO option. In the long term, the losses would respectively be 1.8 percent, 2.1 percent, and 3.2 percent. [23] The OECD considered Brexit as a 'taxing decision' which could cost the UK economy an average of 3.30 percent of GDP in the near term and 5.51 percent of GDP in the long run.[24] HM Treasury carried out SCBAs which concluded that Brexit, in the long run, could cost from 3.8 percent of GDP for the EEA option to 6.2 percent of GDP for a Swiss option and up to 7.5 percent of GDP for the WTO option.

Dhingra et al. (2016) have estimated that the impact of Brexit on the UK economy would range from -1.3 percent of GDP in the near term to -7.9 percent in the long run with a Swiss option. PwC (2016) concluded its study by stating that Brexit would cost the UK economy approximately 3 percent or 5.4 percent of GDP for the Swiss option or the WTO option, respectively. Oxford Economics (2016) considered that, according to its own calculus, Brexit would cost 0.1 percent of UK GDP in the best-case scenario and up to 3.9 percent in the worst-case (or 'populist') scenario.

Booth et al. (2015) considered that Brexit could impact the UK economy, in the 'politically realistic range', from -0.8 percent of GDP up to +0.6 percent of GDP. Ottaviano et al. (2014a; 2014b) predicted that Brexit will cost only 1.1 percent of GDP in a short-term, best-case scenario, but up to 3.1 percent of GDP in a long-term, worst-case scenario. Pain and Young (2004), in one of the first studies of its kind studying the impact of a potential Brexit, concluded that leaving the EU would impact the UK economy by a loss of 2¼ percent of GDP.

Our interim conclusions on SCBAs, which undertake to take into account only the most notable effects of leaving the EU, is that these interesting studies are nevertheless underestimating the full detrimental impact of Brexit. Indeed, most studies conclude that best scenarios would lead the UK economy to suffer very lightly (around 1 percent of GDP) or even experience net gains (see Booth et al., 2015), while the worst-case scenario envisages 'only' an 8 percent loss of GDP (see HM Treasury, 2016). Most importantly, these studies 'speculate' on the available options for post-Brexit UK whereas, as outlined earlier, none of these options are plausible and accepted as such by the UK government and EU officials.

Therefore, an ad hoc solution with unknown benefits and costs shall be reached as a trade deal between the UK and the EU. Furthermore, none of these studies address the two preliminary deals that are precursors to the future trade relationship between the EU and the UK – namely the EU divorce bill and the transitional arrangement. Moreover, these speculative CBAs disregard the dynamic effects of continued UK membership in the EU, as this membership pertains some endogenous growth creation thanks to an ever economically integrated union.[25]

2. Appropriateness of Pragmatic Cost-benefit Analyses

There are numerous dynamic effects of UK membership in regional integration; however, the above-discussed SCBAs overlook the trickle-down benefits of being part of regional integration on a long-term basis. Indeed, these benefits are numerous and tend to increase exponentially with time within the regional club.

Indeed, being a member of a regional economic bloc such as the well-integrated EU means that numerous benefits flood over national economies because of the economies of scale and dynamic effects of economic integration. For instance, Busches and Matthes,[26] using what they call 'backward looking studies', artificially compensate these omitted benefits in SCBAs with the increased level of competition of firms in the regional market and their level of (productive, transactional and dynamic) efficiencies.

Also, capital mobility as well as labour mobility improve the efficiencies of capital markets (minimisation of risks, maximisation of returns) and of labour markets (minimisation of unemployment, maximisation of labour welfare), respectively. None of these benefits are measured in the SCBAs.

Rather than having recourse to SCBAs for Brexit, we shall outline the characteristics of a pragmatic CBA of Brexit (or PCBA) which portends a more comprehensive and long-term approach than the short-term SCBAs discussed above.[27] For, if SCBAs allowed for approximate figures on the costs and benefits for the UK once Brexit will be actual, PCBAs allow for more accurate figures on the costs and benefits of Brexit thanks to the focus on the loss of the benefits of current EU membership for the UK.

If the question for SCBAs was ‘what would be the costs and gains for the UK from Brexit?’, then the question for PCBAs is now ‘what are the opportunity costs for the UK in giving up the gains of EU membership?’ These CBAs are called ‘pragmatic’ because the withdrawal of the UK from the regional bloc implies giving up the gains that were associated with this membership and which were involved in the decision to apply to become a member. The approach is pragmatic because the UK made this calculation at the time of its application in 1971 (for a membership in 1973) and repeated it at the time of every treaty amendment (up until the Lisbon Treaty of 2007).[28] These calculations are those practised by the UK and shall function as starting points for PCBAs.

Even if PCBAs seek to avoid the abovementioned pitfalls of SCBAs, this methodology is nevertheless still fraught with countless uncertainties. This is illustrated by the incredibly wide range of estimates of the current impact of EU membership on the UK, membership that is said to cost the UK economy 11.5 percent of GDP,[29] or to benefit the UK economy by 20 percent of GDP.[30]

However, some more credible PCBAs have been carried out, among them the one by Lee and Leach (2016) from the Confederation of British Industry (CBI).[31] The overall net benefit of EU membership to the UK is said to be around 4 to 5 percent of GDP, “which has accumulated over time”. This estimate comes with some qualifications, since the report details that “there is an unavoidable degree of uncertainty over this judgment, and the benefit may be smaller, but it could also be considerably larger” (Lee and Leach 2016:1).

Lee and Leach reviewed 14 pragmatic CBAs of Brexit and concluded that the UK gains from 4 to 5 percent of GDP each year thanks to its EU membership, and that Brexit would therefore cost approximately the same for the UK economy.[32] In order to reach that estimate, Lee and Leach classified the reviewed CBAs in terms of credibility ratings and range of GDP impacts as shown in table 2.

Table 2 Lee & Leach's Review of CBAs of the Impact of EU Membership on the UK

Credibility rating	Range of GDP impacts	Number of CBAs
1	+0.1% to +3.1%	2
2	-2.5% to +9.5%	5
3	-13% to +31%	7

Busch and Matthes argue that mainstream conclusions are overoptimistic about Brexit's impact on the UK economy due to omitted costs and underestimated benefits of EU membership.[33] Relying on Campos et al.,[34] Busch and Matthes conclude that the risk of GDP loss for the UK economy due to Brexit is in the range of 10 percent of GDP or more in the long run. Consequently, the authors conclude that "Brexit would resemble a potentially dangerous leap in the dark in terms of economic consequences."

The meta CBA provided by Busch and Matthes is the most credible one, as they provide a comprehensive overview of the current PCBAs. They conclude that the net cost for the UK to withdraw from the EU would be a net GDP loss of, on average, 10 percent annually. This estimate proves to be the most plausible one. Be that as it may, this estimate falls short of encompassing all the less tangible costs incurred by regulatory and administrative barriers erected after Brexit. More generally, the incompleteness of even the most plausible meta PCBA such as that of Busch and Matthes begs the question of the current epistemological issues raised by Brexit. We shall now turn to these issues.

III. Epistemological and Regulatory Issues in a Meta Cost-benefit Analysis of Brexit

Clearly, the net costs of Brexit for the UK economy can hardly be measured accurately even with a meta PCBA such as the credible one offered by Busch and Matthes.[35] Indeed, either epistemological issues pertaining to the time variable and political variables, or regulatory issues pertaining to the two prerequisite deals to be struck between the EU and the UK, constitute great limitations on the accuracy of the attempt to deliver a meta CBA on Brexit. Both sets of issues are discussed below.

1. Epistemological Issues

Described as "controversial yet fundamental,"[36] CBAs raise countless epistemological questions.[37] As Masur and Posner point out, "guesswork is not always fatal to cost-benefit analysis. Judgment is needed to distinguish between reasonable estimates and estimates that are excessively wide of the mark."[38] Guesswork should not be underestimated in CBAs, as epistemological issues are numerous.[39]

However, only the two most important and relevant epistemological issues shall be emphasized here, and both are particularly relevant in light of Brexit:

i) The first issue is the time variable: when does the computation of costs and benefits start and when is it supposed to end? Are long-term CBAs more relevant than short-term CBAs?

ii.) The second issue is that of political uncertainties: if Brexit depends on political negotiations, Brexit therefore depends on politics and the politicians' (irrational) behaviours. Consequently, the political uncertainties not only of the political actors but also of external political events (elections, referendums, internal crisis, etc.) are key determinants of the outcome of the Brexit negotiations and therefore of the costs and benefits of Brexit for the UK economy.

a. The time variable

The time variable is one of the greatest uncertainties in carrying out a CBA.[40] Indeed, first and most obviously, the time period envisaged in a CBA increases or reduces the costs and benefits of the analysed regulatory framework. Costs and benefits are dependent on the time span envisaged in the CBA. Indeed, costs and benefits are monetized according to time considerations, which must be carefully contemplated, otherwise the relevance of the overall calculus is doubtful.

Moreover, as explained by Rowell:

> cost-benefit analysis is dependent upon meaningful valuation techniques to support the monetization and comparison of goods, risks, and harms. Meaningful valuations, in turn, must incorporate well-drawn time-signatures to account for the time value of money. The line drawing challenges created *by* time flow thus pose challenges to monetization for intertemporal valuations in cost-benefit analysis. These challenges relate to discounting, because discounting is the method used to account for the time value of money, once the time signatures of various goods are identified. But the phenomenon of time flow is itself distinguishable from questions of discounting, and should be thought of as providing distinctive puzzles to regulatory analysis in general, and to cost-benefit analysis in particular.[41]

In the case of Brexit, what should be the appropriate time span for a CBA: five years? Ten years? A generation? Half a century? The more we limit the time span, the more we may increase the relevance of the figures of the CBA on Brexit, but the less we provide for a full picture of the real costs and benefits of a lifetime choice, as Brexit undoubtedly is.

Most importantly, beyond the obvious issue of the (in)appropriate time span envisaged for CBAs on Brexit, the most interesting question with respect to the time variable on CBAs relates to the so-called discount rates.[42] For, "the deleterious effects of exponential discounting ensure that projects that benefit generations in the far distant future at the cost of those in the present are less likely to be seen as efficient, even if the benefits are substantial in future value terms."[43]

Given the presumably net costs of Brexit in the long term as demonstrated by the above meta CBA, one can legitimately derive from this citation that projects that are costly to generations in the far distant future to the benefit of those in the present are more likely to be seen as efficient and therefore voted in, as illustrated in the case of Brexit.[44]

Those far distant costs are incommensurate.[45] The choice of the relevant time lapse is controversial and debatable. Consequently, how can we reach agreement on an unbiased CBA of Brexit? It is only the aggregation of CBAs on Brexit into a meta CBA such as discussed above that might create the necessary scientific credibility and unprejudiced view necessary to portray the relevant costs and benefits of Brexit.

b. Political uncertainties

CBAs in a highly politically sensitive area are close to ineffective. Indeed, given the political uncertainties derived from closed-door political parties and the irrational sensitivity of political reactions, the rational calculus inherent to CBAs becomes very unlikely to arise.[46] As Masur and Posner rightly argued, "cost-benefit analysis will be ineffective whenever a regulation raises principally normative, political, and institutional questions, rather than technical ones."[47]

In the case of Brexit, the variables are obviously more political than technical, since the ultimate situation depends on internal politics in the UK, as well as in the EU and member states, and depends of course on political negotiations between the UK and the EU. On the other hand, the CBAs of Brexit also depend on the ability of the UK to renegotiate at least 759 treaties with non-EU countries,[48] since, becoming trade independent, the UK will enjoy (or suffer from) new trade relationships which are themselves dependent on political conditions and negotiations with non-EU countries.

As rightly argued, “while Brexit is often cast as an affair between Brussels and London, in practice Britain’s exit will open more than 750 separate time-pressured mini-negotiations worldwide, according to Financial Times research.”[49] In each of these 750 mini-negotiations, political uncertainties will arise to modify and impact on the overall CBA of Brexit.

Negotiations can lead to any possible post-Brexit arrangements, and the UK “needs to prepare ahead of its exit from the EU for all possible outcomes of the negotiations,” as the UK Secretary of State for International Trade Liam Fox clarified.[50] Consequently, a no deal (or so-called Hard Brexit) becomes as likely as any other outcome, depending on the political evolution of the negotiations. These uncertainties surrounding the Brexit negotiations increase the difficulty to ascertain the true costs and benefits of Brexit.

Also, another great uncertainty which reduces the accuracy of CBAs is that CBAs do not generally take into account employment effects.[51] Indeed, job losses or job creation, and their socio-economic impacts, are rarely measured, if they ever could be. This is even more relevant with the CBAs on Brexit.

3. Regulatory Issues

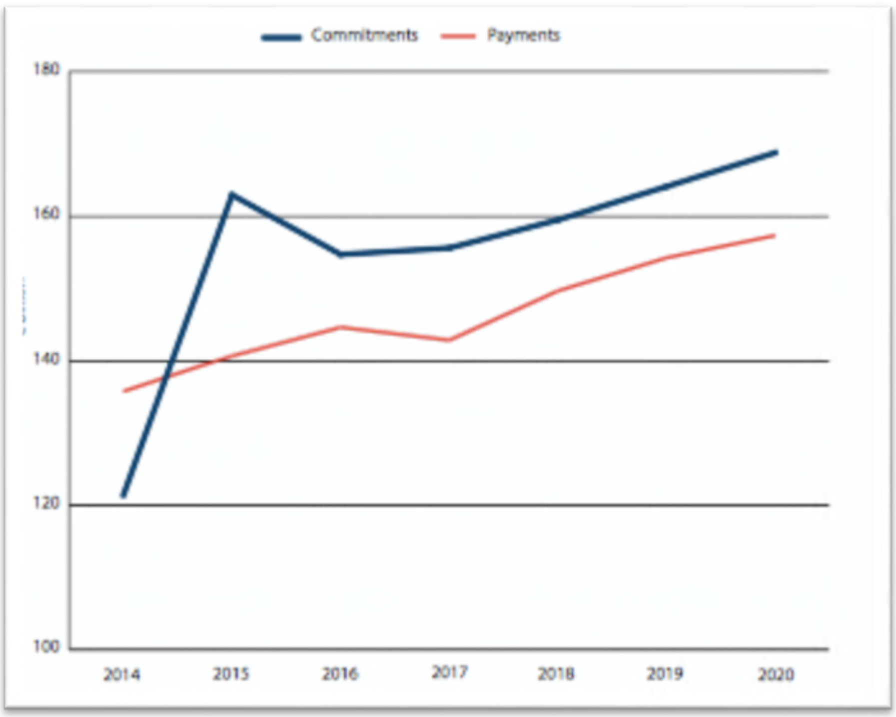
a. The EU divorce bill

There is clear methodology elaborated by the European Commission in order to calculate the extent of liabilities the UK owes to the EU. This methodology has been set out in the European Commission’s Working Paper entitled ‘Essential Principles on Financial Settlement’.[52] The EU obligations stem from the following:

- The Reste à Liquider (RAL) from the successive Multi-annual Financial Frameworks (MFF);
- The financial programming for the period between the date of withdrawal of the United Kingdom and the end of the MFF 2014-2020;
- The liabilities as recorded in the consolidated accounts of the Union which are not balanced by corresponding assets, i.e.: Pensions and other employee benefits, Provisions, Financial liabilities not related to borrowings, Payables and accrued charges other than RAL.[53]

This amounts to an EU divorce bill (also called ‘Exit Bill’) which approximates €60 billion, according to M. Barnier’s estimates, the EU’s chief negotiator.[54] The legally binding financial commitments made by the UK during the current pluri-annual financial framework constitute the main share of the UK's current liabilities towards the EU, as illustrated in figure 1 by the discrepancies between the UK's payments and the UK's commitments in the current budget.

Figure 1 Discrepancies between the UK's payments and the UK's commitments, 2014 to 2020.



Source: the European Commission

b. The transitional agreement

As set out clearly in her Florence speech, UK Prime Minister Theresa May is keen to reach a transitional agreement for an implementation period during which access to one another's markets should continue on current terms between the UK and the EU. This objective is sound and desirable for both parties, since the lack of time necessitates such a status quo transitional period for trade relations.

However, what if such a transitional agreement is not reached due to political embattlement? Because the rationale for the transitional agreement is the non-readiness of both parties to establish a new regulatory arrangement between the UK and the EU by March 2019 (when the UK officially leaves the EU), the lack of a transitional agreement would mean that both parties would enter into a regulatory gap and legal void that would be far from clear and certain as to the regulatory regime that would govern such a period. Additionally, this outcome is far from being implausible to materialise given the current political frictions. Indeed, it is obvious that "it may be possible for the EU and UK to collaborate on finding a smooth transition at the WTO. But it will require consensus at some point, a vulnerability open to exploitation."[55]

Consequently, any CBA of Brexit envisaging only the UK's costs and benefits of the future relationship with the EU compared to the current EU membership is missing the probable outcome of having neither EU membership nor a deal by March 2019 due to the failure to reach a transitional agreement. This no-deal situation with no transitional agreement would lead to a regulatory void with increased political and legal uncertainties. In such a context, past CBAs on potential future agreements would thus become irrelevant.

c. Other regulatory issues

Last but (obviously) not least, the UK will have to renegotiate not less than 759 treaties in order to preserve the quality of its current regulatory framework and of its international cooperation with European countries and third countries.[56]

More generally, a number of regulatory issues are increasing the reliability of CBAs on Brexit. These issues are to be found beyond the mere pretence of the UK being exempted from the costs of EU regulations after Brexit.[57] The regulatory issues associated with Brexit span from the future of UK competition policy as disenfranchised from the EU competition policy (What about cross-border merger? What about extra-jurisdictional effects of competition decisions? etc.).

Indeed, whatever future trade deals the UK will successfully secure with non-EU countries and whatever future relationship the UK will have with the EU, it is doubtless true that "Brexit might itself significantly lessen competition in some UK markets."[58] But since the level of competition is the criterion for the economic efficiency of any given economy, one can legitimately assume that this regulatory issue derived from competition policies will be costly to the UK economy to an unknown extent.[59]

IV. Conclusion

Brexit has been an extraordinarily significant decision for the UK. The extent of the implications of the decision to leave the European Union can hardly be overestimated, and the consequences are yet to be fully envisaged. Nevertheless, the cost-benefit analyses of Brexit carried out until now have enabled us to discuss the potential for meta CBAs. Such meta CBAs reveal a net negative impact of Brexit on the UK economy. Indeed, simply put, “the bottom line is straightforward: under all plausible scenarios, Brexit will make Britain poorer compared with remaining in the European Union.”[60] Presumably, the UK will suffer a 10 percent net GDP loss annually in the most probable case of no deal with the EU, together with a one-off hefty EU divorce bill of €60 billon to pay.

Consequently, one can legitimately ask why the British people decided to vote for Brexit. One rational explanation would be the high discount rate associated with such a decision: the people discounted the long-term costs in favour of the short-term benefits of leaving the EU. Accordingly, it has been found that in regions of the UK where GDP per capita is low, a high proportion of people have low education, a high proportion are over the age of 65 and there is strong net immigration, the majority voted to leave the EU.[61]

Another probable explanation would be the irrational behaviour expressed by the British people due to their heuristic biases and misperceptions of the overall economic and regulatory costs and benefits of belonging to the EU.[62] One final explanation would be that the British people perceive other, intangible (and nonmonetized and incommensurable) costs associated with EU membership, such as political costs of the lack of independence and reputational costs of not standing alone in the concert of nations.[63] The main arguments of Brexiters were not economic but “centred on immigration and national autonomy” (…) and “the inability of the UK to stem the flow of immigrants coming from other EU countries”.[64]

The inability of CBAs to encapsulate different monetized and nonmonetized variables pares down to the commodification critiques of CBAs:[65] CBAs inappropriately commodify goods or values that ought not to be commodified. The inherent limits of CBAs are even more apparent in highly complex frameworks such as the one exemplified by the UK leaving the EU in a time-pressured manner in the context of a democratically demanded Brexit.

Thus, only meta CBAs of Brexit will provide the sufficiently comprehensive picture necessary for scientific certainty. Unquestionably, further meta CBAs encapsulating such behavioural economic calculus shall complement the present, initiating meta CBA of Brexit. This article has contributed to the materialization of a meta CBA of Brexit.

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Endnotes

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[2] Juncker, J-P. (2017) Speech before the Belgian Federal Parliament on the 21st of February 2017, available at: http://uk.reuters.com/article/uk-britain-eu-juncker-idUKKBN160138, accessed 25 October 2017.

[3] Here is the first appearance of the word *Brexit* in the Euractiv blog post written by Peter Wilding: http://blogactiv.eu/blog/2012/05/15/stumbling-towards-the-brexit/, accessed 24 October 2017.
[4] The calls by high politicians were mainly made by pro-Europeans such as former foreign minister Peter Mandelsen. See https://www.theguardian.com/politics/2012/may/03/peter-mandelson-eu-referendum-labour. For the European Union Referendum Act of 2015, which organised the national referendum, see http://www.legislation.gov.uk/ukpga/2015/36/pdfs/ukpga_20150036_en.pdf
[5] European Union (Withdrawal) Bill 2017-19. See the legislative history of the bill: https://services.parliament.uk/bills/2017-19/europeanunionwithdrawal.html
[6] European Union (Notification of Withdrawal) Act of 2017, available at: http://www.legislation.gov.uk/ukpga/2017/9/pdfs/ukpga_20170009_en.pdf
[7] House of Commons Foreign Affairs Committee: Article 50 negotiations: Implications of 'no deal' (Ninth Report of Session 2016-17), ordered by the House of Commons to be printed 7 March 2017, HC 1077; published on 12 March 2017, p.6, available at: https://publications.parliament.uk/pa/cm201617/cmselect/cmfaff/1077/1077.pdf
[8] Mason, Rowena, and Boffey, Daniel. 'Theresa Mays says UK examining Brexit divorce bill 'line by line'', *The Guardian* (London, 20 October 2017) accessed 24 October 2017, available at: https://www.theguardian.com/politics/2017/oct/20/theresa-may-says-uk-examining-brexit-divorce-bill-line-by-line
[9] Article 50 TFEU allows for a two-year negotiation period, after which EU treaties cease to apply to the withdrawing state, unless an extension period has been unanimously granted. Article 50 of the TFEU reads as follows:

> 1. Any Member State may decide to withdraw from the Union in accordance with its own constitutional requirements.
> 2. A Member State which decides to withdraw shall notify the European Council of its intention. In the light of the guidelines provided by the European Council, the Union shall negotiate and conclude an agreement with that State, setting out the arrangements for its withdrawal, taking account of the framework for its future relationship with the Union. That agreement shall be negotiated in accordance with Article 218(3) of the Treaty on the Functioning of the European Union. It shall be concluded on behalf of the Union by the Council, acting by a qualified majority, after obtaining the consent of the European Parliament.
> 3. The Treaties shall cease to apply to the State in question from the date of entry into force of the withdrawal agreement or, failing that, two years after the notification referred to in paragraph 2, unless the European Council, in agreement with the Member State concerned, unanimously decides to extend this period.
> 4. For the purposes of paragraphs 2 and 3, the member of the European Council or of the Council representing the withdrawing Member State shall not participate in the discussions of the European Council or Council or in decisions concerning it. A qualified majority shall be defined in accordance with Article 238(3)(b) of the Treaty on the Functioning of the European Union.
> 5. If a State which has withdrawn from the Union asks to rejoin, its request shall be subject to the procedure referred to in Article 49.

[10] Mason, Rowena, and Boffey, Daniel. 'No Brexit transition period without final EU trade deal, Theresa May tells MPs', *The Guardian* (London, 23 October 2017), available at: https://www.theguardian.com/politics/2017/oct/23/brexit-transition-period-final-eu-trade-deal-theresa-may, accessed 24 October 2017.

[11]At the 'bare minimum', the final trade deal should address, according to the House of Commons, the following issues:

> the institutional and financial consequences of leaving the EU including resolving all budget, pension and other liabilities and the status of EU agencies currently based in the UK; Border arrangements between Northern Ireland and the Republic of Ireland and a recognition of Northern Ireland's unique status with regard to the EU and confirmation of the institutional arrangements for north-south co-operation and east-west co-operation underpinning the Good Friday Agreement; the status of UK citizens living in the EU; the status of EU citizens living in the UK; the UK's ongoing relationship with EU regulatory bodies and agencies; the status of ongoing police and judicial co-operation; and the status of UK participation in ongoing Common Foreign and Security Policy missions; a clear framework for UK–EU trade; and clarity on location of former EU powers between UK and devolved governments.

See House of Commons, Exiting the European Union Committee, First Report of Session 2016–17, *The process for exiting the European.* Article 50 negotiations: Implications of 'no deal' 7 Union and the Government's negotiating objectives, HC 815, para.103.

[12] Treasury Committee (2016) The economic and financial costs and benefits of the UK's EU membership. In *First Report of session 2016-17*, HC 122 London: The House of Commons.

[13] Begg, I. (2017) Making Sense of the Costs and Benefits of Brexit: Challenges for Economists. *Atlantic Economic Journal*, Vol.45; pp.299-315, at 299.

[14]See Blumenthal, J. (2007) Meta-analysis: a primer for legal scholars. *Temple Law Review*, Vol.80, pp.201-244.

[15] May, Theresa. 'Plan for Britain', speech at Lancaster House (London, 17 January 2017), available at: https://www.gov.uk/government/speeches/the-governments-negotiating-objectives-for-exiting-the-eu-pm-speech, accessed 24 October 2017.

[16] The European Free Trade Area (EFTA) Court has exclusive competence for interpreting and applying the EEA agreement, and therefore abiding by the EEA agreement is tantamount to being under the jurisdictional competence of the EFTA Court – something the UK is not willing to accept, as any European jurisdictional competence is being presently rejected by the UK Government (UK Government 2017:13).

[17] Department of International Trade (2017) Preparing for our future UK trade policy. Presented to Parliament October 2017. Cm 9470, at p.5.

[18] See table 1. Professor Kenneth Amstrong argues as well that "the Prime Minister's Lancaster House speech together with the White Paper suggests that there will not be an association agreement governing the UK's future relationship with the EU. Instead, the basis of any agreement would be a Free Trade Agreement not dissimilar to the recently agreed Canada-EU Trade Agreement (CETA)." Submission by Professor Kenneth Amstrong in House of Commons Foreign Affairs Committee: Article 50 negotiations: Implications of 'no deal' (Ninth Report of Session 2016-17) Ordered by

the House of Commons to be printed 7 March 2017, HC 1077, Published on the 12th of March 2017, Appendix 2, p.65, available at: https://publications.parliament.uk/pa/cm201617/cmselect/cmfaff/1077/1077.pdf

[19] British Bankers' Association, 'What is 'passporting' and why does it matter?' BBA Brexit Quick Brief, (London 2017), available at: https://www.bba.org.uk/wp-content/uploads/2016/12/webversion-BQB-3-1.pdf, accessed 25 October 2017.

[20] May, Theresa. 'A new era of cooperation and partnership between the UK and the EU', speech in Florence (Italy, 22nd of September 2017), available at: https://www.gov.uk/government/speeches/pms-florence-speech-a-new-era-of-cooperation-and-partnership-between-the-uk-and-the-eu, accessed 25 October 2017.

[21] HM Government, 'The United Kingdom's exit from and new partnership with the European Union', Cm 9417, February 2017, p.9. This has also been previously said by Prime Minster Theresa May herself, on the 17th of January 2017. See 'Number 10, Speech: The Government's negotiating objectives for exiting the EU', Lancaster House (London, 17 January 2017), available at: https://www.gov.uk/government/speeches/the-governments-negotiating-objectives-for-exiting-the-eu-pm-speech, accessed 24 October 2017.

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[25]See Cruespo Caruesma, J., Ritzberger-Grünwald, D., and Silgoner, M-A. (2008) Growth, convergence and EU membership. *Applied Economics*, Vol.40, pp.643-656; Bloom, Nicholas, Draca, Mirko, and Van Reenen, John (2016) Trade Induced Technical Change? The Impact of Chinese Imports on Innovation, IT and Productivity. *Review of Economic Studies*, 83, pp.87–117; Rivera-Batiz, Luis A., and Romer, Paul M. (1991) Economic Integration and Endogenous Growth, *The Quarterly Journal of Economics*, Vol. 106, pp. 531-555; Campos, N. F., Coricelli, F., and Moretti, L. (2014) Economic Growth and Political Integration: Estimating the Benefits from Membership of the European Union using the Synthetic Counterfactuals Method, *CEPR Discussion Paper* No. 9968; Frankel, J. A., and Romer, D. (1999) Does Trade Cause Growth? *American Economic Review*, 89, 379-399; Williamson, J. (1971) Trade and Economic Growth, in J. Pinder (ed.), *The Economics of Europe*. London: Charles Knight, 19-45.

[26] Bush, B., and Matthes, J. (2016) Brexit – The Economic Impact. A Meta-Analysis. *IW report* 10/2016.

[27] Comprehensiveness in the CBA of Brexit is undoubtedly unreachable, as many factors derived from EU membership impact on an economy. As Lee and Leach (2016) argue, "no one study estimates the benefits and costs of all aspects of EU membership." One can readily think of the following factors as impacting a member state of the EU: the fiscal contribution to the EU budget, trade tariffs, nontariff

barriers, foreign direct investment, level of competition and economies of scale, productivity impact of the single market, harmonised regulation, and justice and police cooperation. Even so, other costs and benefits are clearly omitted, such as psychological barriers, cultural distance, etc.

[28] See, for instance, Gasiorek, Smith and Venables (2002); Ilzkovitz, Dierx, Kovacs, and Sousa (2007).

[29] Congdon, T. (2014) How much does the European Union cost Britain? UKIP. Dagenham.

[30] Bush, B., and Matthes, J. (2016), p.56.

[31] Lee, D., and Leach, A. (2016) CBI Literature review of the impact of EU membership on the UK economy, available at: http://www.cbi.org.uk/news/cbi-literature-review-of-the-impact-of-eu-membership-to-the-uk-economy/

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[43] Groom, B., Hepburn, C., Koundouri, P., and Pearce, D. (2005) Declining Discount Rates: The Long and the Short of It. *Environmental & Resource Economics*, Vol.32, pp.445-493, at p.483. For an opposing view, see Posner, E. (2007) Agencies Should Ignore Distant-Future Generations. *The University of Chicago Law Review*, Vol.74, pp.139-143.

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[44] For a counter-intuitive finding, see Osborne, M., and Turner, M. (2010) Cost Benefit Analyses versus Referenda. *Journal of Political Economy*, Vol.118, pp.156-187 (where the authors conclude that referendum leads to higher welfare than a cost-benefit analysis in a "common value" environment. Cost-benefit analysis is better in a "private value" environment).
[45] See Sunstein, C. (1994) Incommensurability and Valuation in Law. *Michigan Law Review*, Vol.92, p.779, at p.780.
[46] See Wolcher, L. (2007) Senseless Kindness: The Politics of Cost-Benefit Analysis. *Law & Inequality*, Vol.25, p.147.
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[49] *Id.*
[50] Department of International Trade (2017) Preparing for our future UK trade policy. Presented to Parliament. October 2017. Cm 9470.
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[52] European Commission, Working Paper on 'Essential Principles of Financial Settlement', 24th of May 2017, Document n°2, available at: https://ec.europa.eu/commission/sites/beta-political/files/financial-settlement-essential-principles-draft-position-paper_en.pdf accessed 25 October 2017.
[53] Id. p.3.
[54] Jennifer Rankin, EU leaders to insist UK pays its Brexit bill as precursor of trade talks. *The Guardian* (London, 29 April 2017), available at: https://www.theguardian.com/politics/2017/apr/28/eu-leaders-to-insist-uk-pays-its-brexit-bills-as-precursor-to-trade-talks, accessed 25 October 2017; Alex Baker, The €60 Billion Brexit Bill: How to disentangle Britain from the EU budget (Policy Brief, February 2017) Centre for European Reform, available at: http://www.cer.eu/sites/default/files/pb_barker_brexit_bill_3feb17.pdf, accessed 25 October 2017.
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[57] Such pretence is unsubstantiated, since the UK has already one of the lightest regulatory burdens for market products and employment regulations. Furthermore, the regulatory benefits of these regulations are rarely, if ever, considered, so that the regulatory costs from EU regulations are not considered in net terms and therefore are of little scientific valence. See Begg, I. (2017) Making Sense of the Costs and Benefits

of Brexit: Challenges for Economists. *Atlantic Economic Journal*, Vol.45, pp.299-315, at 312.

[58] Vickers, J. (2017) Consequences of Brexit for competition law and policy. *Oxford Review of Economic Policy*, Vol.33, pp.S70-S78, at p.S71.

[59] See Lindsay, A., and Berridge, A. (2017) Brexit, merger control and potential reforms. *European Competition Law Review*, Vol.10, pp.435-436 (where they conclude, at p.436, that "any new protectionism would therefore reverse decades of industrial policy, developed in parallel with – but independently of – Europe.")

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[61] Arnorsson, A., and Zoega, G. (2016) On the Causes of Brexit. *CESifo Working Papers*, N°6056, available at: https://www.cesifo-group.de/DocDL/cesifo1_wp6056.pdf

[62] These biases are related to what Sunstein calls 'rival rationalities'; see Sunstein, C. (2000) Cognition and Cost-Benefit Analysis. *Journal of Legal Studies*, Vol.29, pp.1058-1103, at p.1079. See, more generally, Zerbe, R. (2007) The Legal Foundations of Cost-Benefit Analysis. *Charleston Law Review*, Vol.2, pp.93-184, at pp.150-157.

[63]See Van Reenen, J. (2016) Brexit's Long-Run Effects on the U.K. Economy. *Brookings Papers on Economic Activity*, pp.367-383, available at: https://www.brookings.edu/wp-content/uploads/2017/02/brexits-long-run-effects-john-van-reenen.pdf , last retrieved 15 November 2017 (where he argues that "perhaps people were fully aware of the academic consensus and understood that Brexit would have personal economic costs for them, but they were nevertheless prepared to pay that price for its perceived noneconomic benefits (such as fewer immigrants and greater sovereignty*)*.")

[64] Arnorsson, A., and Zoega, G. (2016) On the Causes of Brexit. *CESifo Working Papers*, N°6056, available at: https://www.cesifo-group.de/DocDL/cesifo1_wp6056.pdf

[65] See Kornhauser, L. (2000) On Justifying Cost-Benefit Analysis. *The Journal of Legal Studies*, Vol.29, pp.1037-1057, at p.1038; Adler, M. (19998) Incommensurability and Cost-Benefit Analysis. *University of Pennsylvania Law Review*, Vol.146, pp.1371-1418.