The Cost of Non-Schengen

Impact of border controls within Schengen on the Single Market

The Cost of Non-Schengen:
the Impact of Border Controls within Schengen on the Single Market

Research paper
by Europe Economics

This study has been written at the request of the **European Added Value Unit** of the Directorate for Impact Assessment and European Added Value, within the Directorate-General for Parliamentary Research Services (DG EPRS) for the European Parliament's Internal Market and Consumer Protection Committee.

Abstract

This paper considers the costs of four scenarios for the reintroduction of border controls within the Schengen area: for two years for seven countries; for two years across the Schengen area; indefinitely for seven countries; and indefinitely across the Schengen area. It identifies how a reintroduction of borders would create costs of 'non-Schengen' and estimates that cost quantitatively. For the highest-cost scenario — indefinite suspension of the whole Schengen area – the cost is 0.06-0.14 per cent of EU GDP, or some €100 billion to €230 billion over ten years.

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Executive summary

The unprecedented influx of refugees and migrants into the EU in 2015 has placed the external borders of the Schengen area under considerable strain. As a reaction, a series of Member States (8 at the time of writing) have reintroduced temporary internal border controls focused on certain border crossings. These developments have led to some parties discussing the reintroduction of permanent border controls within the European Union and thereby suspending the Schengen Agreement indefinitely. The purpose of this paper is to assess the impact of re-establishment of border controls within the Schengen area – the costs of 'non-Schengen'.

If the Schengen area is suspended, among the immediate one-off costs would be those of establishing land borders with neighbouring Schengen Member States. Each Schengen country already has border controls in place on their sea and international airports for passengers travelling from outside the Schengen area. We use previous estimates of the costs of establishing such border controls to estimate the costs of new border controlss within the current Schengen area. We estimate that it would cost €16.9 per capita on average for each Member State to construct land border controls.

In addition to the immediate costs there are further ongoing costs of non-Schengen, which are expected to arise from:

- Time delay costs for commuters and tourists;
- Time delay costs for road freight; and
- Changes in expectations in capital markets, affecting bond yields and currencies.

We have quantified these costs in different scenarios, including:

- 2-year suspension of Schengen limited to a few countries having currently reintroduced border controls;
- 2-year suspension of Schengen covering all Schengen States;
- complete Schengen suspension scenario of a subset of current members; and
- complete Schengen suspension for all members.

In the first two scenarios where we quantify the impacts for a 2-year Schengen suspension we estimate costs to commuters vary between countries affected from nearly €2 million to €560 million for the 2-year period in the first scenario and from €3.4 billion to €12.2 billion for the 2-year period in the second scenario. The costs for tourists following delays are estimated to range between €0.2 million and €9.6 million (depending on the country) for the 2-year period in the first scenario. In the second scenario the costs range from €36 million to €98 million for a 2-year period. The costs of time delay to road freight vary between countries and range from €52 million to €200 million for exported goods per annum, and from €34 million to €190 million for imported goods per annum in the first scenario. In the second scenario we estimate the

cost to vary between countries from €7.1 billion for exported goods to €5.9 billion for imported goods per annum.

In the case of a complete, i.e. a permanent, suspension of the Schengen area for a sub-set of current members, this could affect market expectations about these countries' status within the EU and the euro area, with consequences for bond yields and currencies. We estimate a range of 110-275 basis points (bps)[1] range for sovereign bond yield spreads as the impact of ceasing to be seen as core to the euro project, in the event of an indefinite exclusion from Schengen. The excess payments the countries will have to pay annually on their outstanding debts to compensate creditors for their increased default risk would (at current debt levels, once all debts were refinanced) vary between €331 million for Slovenia and €8.7 billion for Greece. Higher interest rates because of redenomination risk could also damage investment in these countries, at a cost of 1.3 per cent of GDP over 10 years. We have also investigated whether there could be effects upon exchange rate volatility for countries excluded from Schengen that have a Treaty obligation to join the euro but have not yet met the qualifying requirements. We did not find evidence that there would be increased volatility.

We summarise the impact estimates for the different scenarios in the table below. Over a 10-year period, the 'Limited permanent Schengen suspension' scenario (in which a subset of members permanently suspend their participation in the Schengen area) has the greatest costs in terms of the cost as a percentage of GDP for countries affected. In terms of millions of euros, the largest cost is associated with a permanent non-Schengen scenario where all countries exit, which ranges between €100 billion and €230 billion. However, our models suggest that the costs of an indefinite suspension of the Schengen area in a subset of countries could be a significant fraction of the costs of an indefinite suspension of the Schengen area as a whole.

Table 1 Total cost ranges of the scenarios

| Scenario for Schengen suspension | One-off costs (€bn) | Ongoing annual costs | | Total cost (2 years/10 years)** |
		% of GDP of affected countries*	% of EU GDP	(€bn)
Limited two-year	0.7	0.13-0.30%	0.006-0.014%	2.5-5
All countries two-year	7.1	0.07-0.17%	0.06-0.14%	25-50
Limited permanent	0.7	0.05 -0.1% GDP level + 0.13% lower GDP growth + 0.4%-1% fiscal cost	0.006-0.014% GDP level + 0.01% lower GDP growth + 0.05-0.12% fiscal cost	55-70 GDP + 70-170 fiscal
All countries permanent	7.1	0.07-0.16%	0.06-0.14%	100-230

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[1] A basis point is one one hundredth of a percent. So, for example, 50 bps = 0.5 per cent.

Note: * the 'Limited 2-year' and 'All countries 2-year' scenarios for Schengen suspension are calculated as the total cost for 2 years, and the 'Limited permanent' and 'All countries permanent' scenarios are calculated as the total cost over 10 years. The final column is rounded.

Introduction

On 25 January and 2 February 2016 the Coordinators of the Committee on the Internal Market and Consumer Protection (IMCO) decided to request a study on "The Cost of non-Schengen: the Impact of Border Controls within Schengen on the Single Market" for the 21 April 2016 IMCO meeting.

The project was awarded to Europe Economics on 14 March 2016 with a deadline for the complete draft report of 4 April. This extremely compressed timescale constrained the nature of the analysis feasible, meaning it was essential to build upon existing models and data and to focus purely upon a set of costs and scenarios that the authors considered relevant.

The Schengen Agreement is an important complement to the Single Market, giving a tangible reality to the four freedoms outlined in Article 26 of the TFEU. Today, the Schengen area comprise 26 nations, including the non-EU states Norway, Iceland, Liechtenstein and Switzerland as well as all European Union members with the exception of the United Kingdom, Ireland, Romania, Bulgaria, Cyprus and Croatia.[2]

The participating states have abolished all internal borders with a single external border where common rules and procedures are applied with regard to visas for short stays, asylum requests and border controls. Key rules adopted within the Schengen framework include:
- removal of checks on persons at the internal borders;
- a common set of rules applying to people crossing the external borders of the EU Member States;
- harmonisation of the conditions of entry and of the rules on visas for short stays;
- enhanced police and customs cooperation (including rights of cross-border surveillance and hot pursuit);
- stronger judicial cooperation through a faster extradition system and transfer of enforcement of criminal judgments;
- establishment and development of the Schengen Information System (SIS).

Furthermore, and of particular importance in the context of the migration and refugee crisis, the Schengen system with its absence of internal border controls requires robust and harmonised border control measures at the area's external borders. The creation of the European Agency for the Coordination of Operational Cooperation at the External

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[2] We note, however, that not all countries cooperating in Schengen are parties to the Schengen area. This is either because they do not wish to eliminate border controls or because they do not yet fulfil the required conditions for the application of the Schengen *acquis*.

Borders of the Member States (Frontex), which became operational in 2005, and the subsequent rapid evolution in its mandate bear testimony to the focus on achieving a common and effective system of border management.

According to Eurobarometer data (Standard Eurobarometer, Spring 2015), when asked what Europe means to them personally, most citizens in the EU-28 mention the freedom of movement. Indeed, the freedom of movement is named as the first most positive result of the EU integration process.

The unprecedented influx of refugees and migrants into the EU in 2015 has placed the external borders of the Schengen area under considerable strain. As a reaction, a series of Member States (8 at the time of writing) have reintroduced temporary internal border controls focused on certain border crossings. These developments have lead to some parties discussing the reintroduction of permanent border controls within the European Union and therby suspending the Schengen Agreement indefinitely.

The purpose of this paper is to assess the costs of re-establishment of border controls within the Schengen area, the costs of non-Schengen.[3] The briefing paper addresses three main things:

- Describe current measures restricting the Schengen Area;
- Describe the microeconomic mechanisms by which restrictions of the Schengen Area might create economic costs; and
- Assess the macroeconomic impacts of restrictions to the Schengen Area.

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[3] We acknowledge that countries reintroducing border controls believe that there are benefits to them of doing so. However, assessment of such benefits lies outside our scope in this study.

Chapter 1 - How non-Schengen creates economic costs

In this chapter we present in qualitative terms the main economic costs of non-Schengen. Re-introducing border controls could not only deprive people of the benefits of free movement across borders, but could also give rise to non-trivial economic costs for citizens and businesses, undermining the Single Market in respect of all four key freedoms: goods, services, citizens and capital. We have identified four impact areas that we will describe in the subsequent sections.

In addition, there are administrative costs associated with erecting permanent borders and border controls. Here, we distinguish between two types of costs:

- one-off costs i.e. the infrastructure costs of setting up borders e.g. building fences; and
- ongoing costs, in particular the costs of increased personel to maintain the borders and implement and enforce border controls.

I - Impacts on intra-Schengen travel for work and tourism

Commuters that travel across Member State borders might be particularly affected by the introduction of non-Schengen as their place of work and place of residence are in different countries. The direct impact of introducing border controls is that it could increase commuting times, as border controls are likely to increase queuing times for travelers. These queues are most likely to be apparent during rush hours.

Consequential impacts could include restricted job mobility, greater heterogeneity of regional job markets and an uneven development of real estate prices. Border controls could also further intensify difficulties associated with working in other Member States arising from non-Europe in social security systems, direct taxation, and social services.

There are also potential consequences for intra-Schengen tourists as a result of reintroduction of border controls. The direct impacts are the loss of time arising from crossing borders which could also result in a decline in trips – especially short trips and day visits. These losses could be particularly apparent for tourist areas that are close to one or more borders.

II - Impacts on travel into the Schengen Area from outside

If border controls lead to fragmentation in the EU's common visa policy, which currently involves uniform issuing of visas and mutual recognition within Schengen, the tourism and hospitality industries could face non-trivial losses.
Currently, citizens from outside the Schengen area who have obtained a visa to travel in the Schengen area from one country are allowed to visit all other Schengen countries within a certain period of time. Removing such agreements could require applications

to be processed at a national level – increasing the burden for third country tourists who would like to visit more than one country. The administrative burden could increase for both the governments but also for the travelers. Ultimately, this could potentially lead to a decline in foreign visitors to the EU.

III - Impacts on movements of goods and services

Reintroducing border control could directly impact movements of goods and services as waiting times for truck drivers and commuters could increase. Especially relevant are the costs in freight as lorries and trucks are in circulation in Europe entering nations via toll roads.

Businesses could be affected indirectly by the rise in personel costs and other costs such as replenishment of their stocks since just-in-time delivery may be limited. Therefore, reintroducing border control could lead to a rise in transport costs for cross-border trade in the European Union. The impact might go well beyond the transport sector, affecting the volume and costs of the trade of goods and the efficiency of the European logistics sector, potentially increasing prices.

Higher import prices could in turn lead to a general increase in prices as households' and businesses' real incomes fall; and therefore also consumption and investment. That might tend to drive demands for nominal wage rises to compensate - leading to a further rise in prices, which raise unit costs and diminishing international competitiveness, while increasing interest rates as a policy response to higher inflation. That could have an effect on the structure and the level of value chains, foreign direct investment, and location decisions of companies, as well as price competitiveness.

IV - Impacts on capital investment, leading to segmentation of the single capital market, with implications for bond yields and currencies

It is plausible that financial markets might interpret permanent exclusion from the Schengen area as a signal that a country is no longer part of the EU's "core", which could in turn be interpreted as having implications for that country's membership of the euro (either as a current member of as a future member of the EMU). This could for example mean that in a period of fiscal crisis, markets believe it less likely that other countries would provide emergency loans and/or that there is greater redenomination risk.

Such risks might lead to higher yields for government bonds. This could have implications for the price of other financial assets, for the interest rates faced by firms and households and, potentially, a negative impact on the real economy. For example, higher interest rates mean that consumers do not have as much disposable income and must cut back on spending, whilst corporates find investment projects more expensive to service and consequently may reduce investment.

Fragmentation in the risk expectations of investing in different countries can lead to fragmentation in real interest rates among the states in the monetary union and outside. Changes in interest rates across nations could also affect the exchange rates between the euro and the local currencies of the countries that are not members of the monetary union, which in turn could affect import and export prices and have a negative impact on the real economy. Segmentation of the single capital market can thus lead to decreased cross-border demand and increased cost of capital to issuers.

Chapter 2 - Findings of previous studies as to the costs of non-Schengen

There are a number of previous studies that have evaluated the costs of non-Schengen and a summary of the findings and methodologies of these are below. We state briefly the scenario used in the studies followed by the identified drivers of costs, the cost estimates and the methodology used to estimate these.

I – Bruegel (2 February 2016)

1. Scenario details

- Waiting times at the border would increase commute times.

2. Drivers of cost

- Commuting times; personal and business trips; freight costs; first step towards potential renationalisation in other areas.

3. Cost estimate

- Commuting times: €3-4bn a year.

4. Method

- Appears to be calculations for opinion article published in Wirtschaftswoche and El Mundo. May be based on a study, but the attribution is not clear.

II – France Stratégie (3 February 2016)

1. Scenario details

Re-establishing permanent border controls within the Schengen Area.

- Scenario 1: random controls for private cars and lorries, as before Schengen, with moderate delays.
- Scenario 2: more frequent but not systematic controls, leading to a doubling of average delay times.

2. Drivers of cost

- Tourism – reduction in revenue from short-term visits from other Schengen Member States. Potential impact on Schengen Visa not quantified.
- Commuting time – willingness to pay to avoid commuting time.
- Cross-border job opportunities – assume 0.5 elasticity of job supply to wages and apply commuting time impact as wage equivalent.
- Freight transport: 30 minutes extra time for goods and hauler for goods loaded in France and unloaded in another Schengen country, or vice-versa.
- Trade impacts: shadow tax of 3 per cent on the value of exchanged goods and services.
- Other effects, not quantified: impacts on foreign direct investment and financial flows; impact on the European project.

3. Cost estimate

- Tourism – Scenario 1: €500m a year; Scenario 2: €1bn a year.
- Commuting Time – €250m a year; Scenario 2: €500m a year.

- Cross-border job opportunities – Scenario 1: €150m. Scenario 2: €300m.
- Imports and exports - Scenario 1: €62m; Scenario 2: €124m each for imports and exports.
- Trade impacts: French GDP 0.5 per cent lower in 2025 compared to BAU, Schengen area as a whole 0.8 per cent (equivalent to over €100bn).

  4. Method
- Partial equilibrium estimates for a series of individual components for the short-run impacts of delays. Modelling of 3 per cent ad valorem tax on trade flows using the MIRAGE CGE model.

III – Bertelsmann Stiftung (22 February 2016)

1. Scenario details
- Permanent reintroduction of checks at all internal borders. The potential complete loss of the Schengen Agreement. Two scenarios: conservative – 1% rise in import prices; pessimistic – 3% rise in import prices.

  2. Drivers of cost
- Higher import prices lead to a general rise in prices. Households and business real incomes fall and therefore consumption and investment. Wage demands then increase, leading to a further rise in prices, which then raise unit costs and diminish international competitiveness, while increasing interest rates.
- Other costs are considered briefly on a qualitative basis: impacts on complex value chains; tourism; interstate workers; potential loss of single Schengen visa; impact on infrastructure projects; loss of safety-relevant data in Schengen Information System (SIS); reduction in coordination of asylum and refugee policy; noticeable regression in broader unification; loss of mechanism for non-EU countries to integrate with EU; symbolic value to citizens; and reduction in cultural exchange.

  3. Cost estimate
- Scenario 1: EU24 (excluding Luxembourg, Malta, Cyprus and Croatia) would see a loss in annual growth of 0.04 percentage points, which would amount to total macroeconomic losses of €471 billion by 2025.
- Scenario 2: EU24 would see a loss in annual growth of 0.12 percentage points, which would amount to total macroeconomic losses of €1,430 billion by 2025.

  4. Method
- Increases in import prices are implemented in a global forecast and simulation model (VIEW, developed by Prognos AG), which should capture interactions between countries.

IV – Morgan Stanley (1 March 2016)

1. Scenario details
- Suspension of Schengen. 5 per cent increase in transport costs.

2. Drivers of cost

- Reduction in intra-European trade, leading to a reversal of some benefits of the Single Market (e.g. product specialisation, economies of scale and institutional competition) to be reversed.

3. Cost estimate

- Bilateral trade flows could decline by 10 to 20 per cent. Overall loss of GDP growth: 0.2 per cent. 2 per cent reduction in gross operating surplus in manufacturing industry.

4. Method

- Simulation using existing economic model, no details provided.

V – European Commission (4 March 2016)

1. Scenario details

- Full re-establishment of border controls within the Schengen area.

2. Drivers of cost

- Additional costs for road transport of goods; lost tourism; administrative costs in managing border controls.

3. Cost estimate

- €5-18 billion a year (0.05-0.13 per cent of GDP), of which the largest impact would be a €1.3bn-€5.2bn increase in costs for cross-border workers.

4. Method

- Not reported in press release.

A summary of the cost estimates from the above mentioned research are presented in **Table 2 Summary of cost estimates from previous research** below.

Table 2 Summary of cost estimates from previous research

Study	Cost estimate
Bruegel	Commuting times: €3-4bn a year.
Strategie	Tourism – Scenario 1: €500m a year; Scenario 2: €1bn a year.
France Stratégie	Commuting Time - Scenario 1: €250m a year; Scenario 2: €500m a year.
France Stratégie	Cross-border job opportunities – Scenario 1: €150m. Scenario 2: €300m.
France Stratégie	Import and Export - Scenario 1: €62m each for imports and exports; Scenario 2: €124m each for imports and exports.
France Stratégie	Trade impacts - French GDP 0.5 per cent lower in 2025 compared to BAU, Schengen area as a whole 0.8 per cent (equivalent to over €100bn.
Bertelsmann Stiftung	Scenario 1: EU24 (excluding Luxembourg, Malta, Cyprus and Croatia) would see a loss in annual growth of 0.04 percentage points, which would amount to total macroeconomic losses of €471 billion by 2025.
Bertelsmann Stiftung	Scenario 2: EU24 would see a loss in annual growth of 0.12 percentage points, which would amount to total macroeconomic losses of €1,430 billion by 2025.
Morgan Stanley	Bilateral trade flows could decline by 10 to 20 per cent. Overall loss of GDP growth: 0.2 per cent. 2 per cent reduction in gross operating surplus in manufacturing industry.
European Commission	€5-18 billion a year (0.05-0.13 per cent of GDP), of which the largest impact would be a €1.3bn-€5.2bn increase in costs for cross-border workers.

Chapter 3 - Scenarios

I - Two-year Schengen controls scenarios

1. Scenario 5.1[4] - Limited to a few countries having currently reintroduced border controls

This scenario describes the impact of border controls recently introduced by some Nordic and eastern European Schengen Member States in response to the migrant crisis. These include Austria, Slovenia, Hungary, Sweden[5], Norway and Denmark.[6] Conceptually, Greece is also included in this scenario (though there is no associated cost for reasons explained below).

2. Scenario 5.2[7] - Covering all Schengen States

In this scenario, borders are established between *all* Schengen Member States, for a two year period.

II - Complete Schengen suspension scenarios

1. Scenario 6.1[8] - Indefinite exclusion from the Schengen system of a subset of current members

In this scenario, the seven Schengen members listed above leave the Schengen area permanently.

2. Scenario 6.2 - Indefinite complete suspension of the Schengen system

In this scenario the Schengen system is suspended indefinitely for all members.

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[4] See page 22

[5] http://www.bbc.co.uk/news/world-europe-35218921

[6] We note that other Schengen members have, at points, introduced controls. However, we restrict our analysis to these six, being the Scandinavian countries that have introduced controls and countries along the route many migrants have taken.

[7] See page 25

[8] See page 31

Chapter 4 - Immediate one-off costs

KEY FINDINGS

- The Commission estimates that the preferred distributed entry exit system (EES) option would cost each Member State €6.8m in one-off costs and €2.6m in annual ongoing costs.
- We approximate that to form a land border; it would cost €16.9 per capita on average for each Member State.

If Schengen membership ceases to exist, one of the immediate costs would be establishing land borders with neighbouring Schengen Member States. Each Schengen country already has border controls in place on their sea and international air ports for passengers travelling from outside Schengen zone. With the cession of the Schengen, this would extend to intra-Schengen flights and sea routes. We assume that additional controls to monitor passenger flows on airports and sea routes will not incur significant costs where borders are already established. Thus, in this report, we only estimate the border costs associated with establishing additional land borders and monitoring road rail traffic.

We approximate the costs of establishing a land border by analysing costs incurred by existing Member States in constructing new border infrastructure and upgrading existing borders to enter the Schengen Area.

The European commission established a fund called the "Schengen Facility" to help new Member States finance border infrastructure enhancements in anticipation of joining the Schengen Area. Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia could access the fund to compensate for eligible expenses incurred in upgrading border infrastructure and processes ahead of their December 2007 entry into the Schengen Area. Costs covered under the Schengen Facility were:

- border checks;
- border surveillance;
- visa management;
- IT systems
- training; and
- management of the Schengen Facility".

The table below shows the expenditure by different Member States on establishing Schengen compliant borders.

Table 3: Expenditure under the Schengen Facility on upgrading border infrastructure and processes

Country	Amount funded by Schengen facility(€ m)	Amount funded nationally (€m)	Total cost of border upgrade (€ m)	Population (2005)
Estonia	77	5	82	1,330,000
Hungary	154	39	192	10,098,000
Latvia	79	13	92	2,307,000
Lithuania	150	26	176	3,431,000
Poland	283	5	289	38,530,000
Slovakia	54	10	64	5,401,000
Slovenia	114	59	173	1,967,000
Total	910	157	1,068	63,064,000

Notes: *"Programme amount available" is the total amount a country could have spent under the programme; "final eligible costs" is the amount spent on qualified expenses under the programme; final eligible costs greater than programme amount available for Poland due to exchange rate movements between the euro and the złoty; costs not adjusted for inflation.
Source: European Commission; United Nations; Europe Economics' calculations.

Based on a total cost across the countries of €1,068m and their total population of 63m, the average land border costs €16.9 per capita for these countries.[9]

In addition, the European Commission has commissioned studies on the cost analysis of smart borders for the Schengen area.[10],[11] It estimates one-off and ongoing cost estimates for the preferred options of EES (entry exit system) under a centralised system (i.e. central EU-wide administration) and a distributed system (i.e. administered by individual Member States). For the purpose of this report, the latter seems more reflective of the cost of establishing smart borders for each Schengen Member State. The Commission estimates that the preferred distributed EES option would cost each Member State €6.8m in one-off costs and €2.6m in annual ongoing costs. It is important to note that the EES system is still not in place and European commission smart border

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[9] We note that this crude average does not capture the variance between situations in individual countries. In a study with a longer timescale we might have considered attempting to attribute costs from borders in a more fine-grained way, taking account of the similarities between existing borders (and their costs) and the new borders that would need to be erected and maintained.

[10] http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/borders-and-visas/smart-borders/docs/smart_borders_costs_study_en.pdf

[11] European Commission (2013) "Impact assessment: proposal for a regulation of the European Parliament and of the Council establishing an entry/exit system to register entry and exit data of third-country nationals crossing the external borders of the Member States of the European Union", p. 14.

package is expected to come shortly with the latest estimated costs of forming borders.[12] As it becomes standard at borders we should expect it to feature on new intra-Schengen borders, also. That could mean an additional ongoing cost to a border over-and-above the one-off costs we use in this report. However, we observe that these are very small compared with annual costs we use in later sections and we do not at this stage include an allocation for ongoing EES costs in our model.

Table 4: One-off and on-going costs of EES (entry exit system)

	Distributed system	
	One-off	Ongoing
Hardware	€35.7m	€54,000
Infrastructure	€1.8m	0
Software	€67.5m	€0.9m
Administration	€27m	€56.6m
Office space	€36.5m	€14.0m
Contractor development	€106m	€0.4m
Other (training, meetings)	€11.8m	€1.2m
Total	€191m	€73m
Average per country (26 Schengen members plus Romania and Bulgaria)	€6.8m	€2.6m

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[12] The Commission provided a 2016 update estimate on EES systems on 6 April 2016, after production of this report: http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/securing-eu-borders/legal-documents/docs/20160406/regulation_proposal_entryexit_system_borders_package_en.pdf The Commission's revised proposal notes the following:

"The costs: in the 2013 proposals, 1,1 billion EUR was set aside as an indicative amount for the development of an EES and an RTP. For the revised proposal, based on the preferred option of a single EES system including the law enforcement access, the amount needed has been estimated at EUR 480 million."

For our purposes here we observe that we have not relied upon the €1.1bn budget allocation from the 2013 report and accordingly have not needed to revised our figures in the light of this new publication.

Chapter 5 - Impacts of two-year Schengen controls

Key findings

Costs to commuters:

- *Scenario 5.1*: The costs vary between countries from approximately €1m to €280m per annum (€2m to €560m for two years).
- *Scenario 5.2*: The total costs range from €1.7bn to €6.1bn per annum (€3.4bn to €12.2bn for two years for all Schengen states).

Costs to tourists:

- *Scenario 5.1:* The costs vary between countries from €0.1m to €4.8m per annum (€0.2m to €9.6m for two years).
- *Scenario 5.2:* The costs range from €18m to €49m per annum (€36m to €98m for two years).

Time delay costs of road freight

- *Scenario 5.1:* The costs vary between countries from €52m and €200m for loaded goods per annum and from €34m and €190m for unloaded goods per annum.
- *Scenario 5.2*: The costs vary between countries from €7.1bn loaded goods and €5.9bn for unloaded goods per annum.

Table 5: Total costs of two year Schengen suspension

Scenario for Schengen suspension	One-off costs (€bn)	Cost to commuters (annual)	Cost to tourists (annual)	Cost to road freight (annual)	Total cost (2 years)*
		(€bn)	(€bn)	(€bn)	(€bn)
Limited two-year	0.7	0.2-0.6	0.005-0.02	0.7-1.3	2.5-5
All countries two years	7.1	1.6-6.1	0.02-0.05	6.5-13	25-50

Note: *2 year costs projected over next two years GDP.

I - Narrative description of impacts

This scenario describes the impact of border controls recently introduced by some Nordic and eastern European Schengen Member States in response to the migrant crisis. These include Austria, Slovenia, Hungary, Sweden, Norway and Denmark. Conceptually, Greece is also included in this scenario, but there is no associated cost in our quantification below because there is no land border between Greece and any other Schengen member state. Apart from the immediate one-off costs associated with

forming a land border with neighbouring countries, suspension of the Schengen area would also be likely to create costs for commuting workers, tourists and road freight. Most of these costs will stem from the delays and inconvenience caused at the border check posts. However, without the Schengen travel zone, Member States may also lose on international tourism as visa requirements will deter tourists to visit these countries due to the cost and the inconvenience of filling multiple visa applications.

The first scenario describes the impact of a sub-set of the Member States leaving the Schengen Agreement whilst the second scenario describes the impact of all Member States suspending the agreement for two years. As borders are imposed between these countries, the main costs associated are those of delays due to security checks at the border. For instance, a direct train journey from Sweden to Copenhagen is no longer possible and would add a further 30 min commute time.[13]

There are approximately 350,000 cross-border commuters (whom we assumed work 233 days per year) that could be affected by the introduction of border controls in terms of time delays, which costs them leisure time or consumption (in the event that they would work instead of bearing greater travel time). We take the marginal cost of such delays as the wages of workers. In addition it is plausible that the increased time of commuting would reduce cross-border job opportunities for those nations that are non-Schengen. Not only, could this cause economic losses in terms of unemployment but also in the efficiency of labour skill distribution. Decrease in labour flows would reduce benefits from inflows of skills that are not available in the domestic economy (non-Schengen) that could suffer in the long-term. As well as losing in global markets, non-Schengen countries could lose in terms of competitiveness in European markets as a result of lower labour productivity and human capital compared to the countries still in the Schengen Agreement. This effect would not be prevalent in the second scenario where all countries exit the agreement.

There are also potential consequences for intra- and extra-Schengen tourists as a result of reintroduction of border controls. The direct impacts are the loss of time arising from crossing borders which could also result in a decline in trips – especially short trips and day visits within Schengen. In addition, tourists from outside Schengen may decline in the countries that abolish the agreement. In the first scenario, the countries that leave Schengen could face losses in their hospitality and tourist industries which could lead to material economic consequences if these industries are particularly important in the country e.g. Greece. That could in turn affect the competitiveness of the non-Schengen countries compared to the Schengen members. However, in the second scenario there are plausible losses for all Member States. The countries that are likely to suffer the most are those that are smaller and have close borders e.g. Luxemburg.

Freight transport and movements of goods and service are likely to face extra time when loaded in one and unloaded in another Schengen country. There are several plausible indirect impacts of such time delays. In the first scenario there could be fragmenting impacts of labour and input costs between the Schengen and non-

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[13] http://www.bbc.co.uk/news/world-europe-35218921

Schengen countries stemming from the increase in time for those that have to travel into a controlled border. This could lead to reduction in intra-European trade, leading to a reversal of some benefits of the Single Market (e.g. product specialisation, economies of scale and institutional competition).

II - Quantitative estimation

In the sections below we set out two temporary non-Schengen scenarios and quantify impacts in those two scenarios.

1. Scenario 5.1: Limited to a few countries having currently reintroduced border controls

The closing of borders by the Schengen States of scenario 1 that have land borders with other Schengen members (Austria, Denmark, Hungary, Slovenia, Norway and Sweden) is likely to lead to delays for tourists, commuters and road freight passing through these countries.

Time delay cost to commuters

To estimate the time value cost to commuters, we use commuting data from the European Commission report on cross border mobility.[14] The data used is for 2006. It measures the number of commuting workers commuting to and from each Member State to EU-15 and in some instances EU-12 countries. It is likely that cross border commuting has increased over the years between the Member States and hence, the estimates of the costs are likely to be conservative.

We have assumed the time taken for each border crossing to be between 13 minutes and 47 minutes. The values have been derived from the Stefan Batory Foundation's study of the EU's eastern external land borders in 2007.[15] The study examined crossing points in Bulgaria, Estonia, Finland, Hungary, Poland, Romania and Slovakia and their respective non-EU neighbouring countries. The time to cross different borders from one country to another neighbouring country varies. Because we would expect crossings between EU member states to be more straightforward and faster than those between non-EU and Schengen area states, we used data for the non-Schengen state closest to achieving EU Accession, Serbia, and the time for crossings between it and Romania (13 minutes) and Hungary (47 minutes). These were also the two lowest figures from the study.

The monetary time value assigned to the delay is the average hourly wage in the countries concerned. As only six Schengen Member States have closed their borders in

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[14] European Commission (2009) " Scientific Report on the Mobility of Cross-Border Workers within the EU-27/EEA/EFTA Countries" Final Report commissioned by DG Employment and Social Affairs presented by MKW Wirtschaftsforschung GmbH.
[15] The Stefan Batory Foundation (2008) "Gateways to Europe – checkpoints on the EU external land border"

this scenario, the number of workers commuting in to the country are likely to face more delays than those commuting out to countries (other than those commuting out to the Nordic countries Denmark, Norway and Sweden which are part of the EU-15)[16]. Hence, to estimate the costs to commuters without double counting, we only focus on workers commuting to the Member States from EU-15. This will understate the total cost of time delay to commuters with the actual commuting costs being higher.

The table below shows both cost of time delay to in-commuting and out-commuting workers. However, to avoid double-counting we only focus on the in-commuting costs which varies between €1.6 thousand in Slovenia to €600 thousand in Austria per day per country.

Table 6: Time delay cost to commuters

	Average hourly wage, €	Range time delay, minutes	Range cost to in-commuters, €m	Range cost to out-commuters, €m
Austria	15.9	13 - 47	166 - 601	91 – 329
Denmark	18.9	13 - 47	63 – 227	5.2 – 19
Hungary	*3.7*	13 - 47	11 – 40	13 – 48
Norway	26.4	13 - 47	91 – 330	11 – 41
Slovenia	6.8	13 - 47	1.6 – 5.9	20 – 71
Sweden	19.4	13 - 47	27 - 97	0.13 – 0.47

Source: Eurostat. Europe Economics calculations.

We assume that commuters make two crossings per day and commute 233 times per year. For in-commuters (which are those we use in later calculations, so as to avoid double-counting, since an out-commuter from one Schengen country into another will appear in the data as an in-commuter for that other country). That produces the annual costs in the table below.

With two year Schengen controls, this cost will be between approximately €2m in the low-cost scenario for Slovenia to €560m in the high-cost scenario for Austria. Austria bears the highest total costs, even though its average wages are lower than, for example, Norway, because Austria is the country with the largest number of workers commuting to and from other Member States.

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[16] The EU-15 member states are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom. The EU-12 member states are: Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain and United Kingdom.

Table 7: Time delay cost to in-commuters per annum

	Range cost to in-commuters, €m
Austria	77-280
Denmark	29-106
Hungary	5-19
Norway	42-154
Slovenia	1-3
Sweden	13-45
Total	168-606

Source: Eurostat. Europe Economics calculations.

Time delay costs to tourists

Time delays at the borders will cause inconvenience to tourists. Such costs will vary according to the time value of money for each tourist and the time taken to cross the border.[17]

Again using average hourly wages as our proxy for the monetary value of time and approximate time delays of between 13 minutes and 47 minutes at the border, and that the average tourist has a time value of money one twenty-fourth the average wage in a country visited we estimate the minimum and maximum cost of border crossing delays for tourists staying at least one night in the Member State in the table below.

The cost to tourists varies between €0.1m in Hungary to €4.8m in Norway per year. With two year Schengen controls, this will vary from €0.2m in Hungary to €9.6m in Norway.

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[17] The time value of money for tourists depends on their average wage and not that of the destination country. Also, tourists may include a number of non-wage-earners (e.g. children, pensioners). Tourists may also be less time-sensitive than workers (travel may be part of the experience). We assume that tourists have a time value of money one twenty-fourth that of domestic workers in the country visited.

Table 8: Time delay cost to tourists

	Number of tourists from EU-28 excluding domestic tourists, m	Time value of money, €/hour	Range of cost to tourists, €m
Austria	9,052,873	16/24	1.3 – 4.7
Denmark	6,469,365	19/24	1.1 – 4.0
Hungary	3,927,825	4/24	0.13 – 0.5
Norway	5,520,434	26/24	1.3 – 4.8
Slovenia	2,264,179	7/24	0.14 – 0.5
Sweden	5,520,434*	19/24	1.0 – 3.5

Note: *Approximated with the Norwegian figure as direct data is not available for Sweden.
Source: Eurostat. Europe Economics calculations.

Time delay costs of road freight

With closing of borders of the six Member States, road freight will have to go through security and clearance checks before entering and leaving the six countries (Hungary, Austria, Slovenia, Norway, Sweden and Denmark).

The France Strategie report on the economic cost of rolling back Schengen assumed two scenarios: one in which border controls cause 30min delay in average and the second in which controls lead to an hour of delay.[18] In this section, we estimate the costs to freight transport for both these scenarios half an hour of delay at the border and an hour of delay (i.e double the costs of half an hour delay).

The value of time in goods is estimated to be €0.6 per hour per ton for France. Assuming the value of goods is likely to differ by Member States according to their purchasing power parity, we scaled the French estimate to calculate the value of time in goods for each of the six Schengen States.

The value for hauler is €37 per hour for France. We have assumed this to be similar across the six Member States.

With half an hour of delay, the estimated freight delay costs vary between €26m and €100m for international goods loaded in Denmark and Austria respectively on an annual basis. For an hour of delay, this value will double i.e. freight delay costs will vary between €52m and €200m for international goods loaded in Denmark and Austria respectively.

For unloaded goods, the freight delay costs vary between €17m in Norway and €95m in Austria per year. For an hour of delay, the value will double – €34m and €190m for international goods loaded in Norway and Austria respectively.

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[18] http://blog.en.strategie.gouv.fr/wp-content/uploads/2016/02/FS_-NA39_Schengen-english.pdf

Table 9: Time delay cost of loaded international goods with half an hour of delay

	Volume of goods (m tons)	Lorry crossings (m/year)	Value of time in goods (€/h/ton)	Value of time for hauler, (€/h/lorry)	Delay at the border (hour)	Cost in goods (€m)	Cost for hauler (€m)	Total cost (€m)
Austria	10.8	5.2	0.61	37	0.50	3.3	97	100
Denmark	2.7	1.3	0.75	37	0.50	1.0	25	26
Hungary	10.6	5.2	0.30	37	0.50	1.6	96	98
Norway	3.2	1.6	0.79	37	0.50	1.3	29	30
Slovenia	8.1	4.0	0.44	37	0.50	1.8	73	75
Sweden	3.2	1.5	0.70	37	0.50	1.1	28	29

The total cost across the six countries for this case (summing the final column) is €358m.

Table 10 Time delay cost of loaded international goods with an hour of delay

	Volume of goods (m tons)	Lorry crossings (m/year)	Value of time in goods (€/h/ton)	Value of time for hauler, (€/h/lorry)	Delay at the border (hour)	Cost in goods (€m)	Cost for hauler (€m)	Total cost (€m)
Austria	10.8	5.2	0.61	37	1	6.6	194	200
Denmark	2.7	1.3	0.75	37	1	2	50	52
Hungary	10.6	5.2	0.3	37	1	3.2	192	196
Norway	3.2	1.6	0.79	37	1	2.6	58	60
Slovenia	8.1	4	0.44	37	1	3.6	146	150
Sweden	3.2	1.5	0.7	37	1	2.2	56	58

The total cost across the six countries for this case (summing the final column) is €716m.

Table 11: Time delay cost of unloaded international goods with half an hour of delay

	Volume of goods (m tons)	Lorry crossings (m/year)	Value of time in goods (€/h/ton)	Value of time for hauler, (€/h/lorry)	Delay at the border (hour)	Cost in goods (€m)	Cost for hauler (€m)	Total cost (€m)
Austria	10.2	4.9	0.61	37	0.50	3.1	92	95
Denmark	2.0	1.0	0.75	37	0.50	0.7	18	19
Hungary	10.6	5.2	0.30	37	0.50	1.6	95	97
Norway	1.8	0.9	0.79	37	0.50	0.7	16	17
Slovenia	6.7	3.2	0.44	37	0.50	1.5	60	62
Sweden	2.3	1.1	0.70	37	0.50	0.8	20	21

The total cost across the six countries for this case (summing the final column) is €311m.

Table 12 Time delay cost of unloaded international goods with an hour of delay

	Volume of goods (m tons)	Lorry crossings (m/year)	Value of time in goods (€/h/ton)	Value of time for hauler, (€/h/lorry)	Delay at the border (hour)	Cost in goods (€m)	Cost for hauler (€m)	Total cost (€m)
Austria	10.2	4.9	0.61	37	1	6.2	184	190
Denmark	2	1	0.75	37	1	1.4	36	38
Hungary	10.6	5.2	0.3	37	1	3.2	190	194
Norway	1.8	0.9	0.79	37	1	1.4	32	34
Slovenia	6.7	3.2	0.44	37	1	3	120	124
Sweden	2.3	1.1	0.7	37	1	1.6	40	42

The total cost across the six countries for this case (summing the final column) is €622m.

Drawing upon the figures above, in this scenario one-off costs, annual costs and the cost over the full two-year period under consideration, for the seven countries affected are as follows.

Table 13 Total cost ranges of the scenarios

Scenario for Schengen suspension	One-off costs (€bn)	Ongoing annual costs		Total cost (2 years) (€bn)
		% of GDP of six affected countries	% of EU GDP	
Limited two-year	0.7	.13-.30%	.006-.014%	2.5-5

These figures are calculated as follows:
- €16.9 per capita, over the 41m citizens of the six states that introduce new land borders (noting that Greece has no land border with another Schengen member) produces a one-off cost of creating a border of €0.7bn.
- Ongoing annual costs, across the six affected countries, are obtained by summing the totals for commuters, tourists, imported freight and exported freight. For the minimum cost scenario this sums to €842m and for the maximum cost scenario the sum is €1,962m. These in turn constitute 0.13-0.3% of the GDP of the six affected Member States, or 0.006-0.14% of EU GDP.
- Over a two year period the total of these figures is €2.4bn-€4.6bn. So, for example, €0.7bn + €1.96bn x 2 = €4.6bn for the upper end of the range, which we round to €5bn.

2. Scenario 5.2: Covering all Schengen States
In this scenario borders are introduced between *all* Schengen Member States.

Time delay cost to commuters

To estimate the time value cost to commuters, we use commuting data from the European Commission report on cross border mobility.[19] The data used is for 2006. It is likely that cross border commuting has increased over the years between the Member States and hence, the estimates of the costs are likely to be conservative. On the other hand, the ways modern technology and modern working practices have increased the scope for remote and online working, as well as outsourcing of certain activities, could have reduced the impact of border controls.

The average annual wage in Schengen member states is €22,726 in 2014. Assuming 233 working days in a year and each day being 7.5 hours long, gives us an hourly wage of €13. We have used this average hourly wage as a proxy for commuter's time value of money.

If Schengen Member States established borders then the primary cost to those crossing the border would be the time spent in the crossing. We do not need to make any assumption about the mode of transport. For instance, delays for passport control could be directly at the border (in the case of cars) or on the foreign side of the border prior to crossing (as with trains, such as Eurostar passport control). We assume the same delays in each case.

In the table below, we estimate the total cost to commuters (both commuting to and from the country) which comes out to be between €5.9m and €21.5m per day.

As in-commuters in one Member State could be out-commuters for another Member State, we only use data on in-commuting (commuters coming in to the destination country from EU-15 or EU-12) to estimate the time delay cost on commuters in the absence of the Schengen agreement. This ranges from €3.6m to €13.1m per day.

Table 14: Cost to commuters per day, €m

	Estimates
Time delay, minutes	13 - 47
Total number of in-commuters per day	777,537
Total number of out-commuters per day	767,852
Cost to in-commuters, €m	3.6 – 13.1
Cost to out-commuters, €m	2.3 – 8.4

Note: In-commuters and out-commuters data is for 2006 for Schengen countries to the EU-15 or EU-12. For missing country values, averages were used. Wages used are for each country.

With two year Schengen controls, this cost will be between approximately €3.4bn in the low-cost scenario and €12.2bn in the high-cost scenario.

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[19] European Commission (2009) " Scientific Report on the Mobility of Cross-Border Workers within the EU-27/EEA/EFTA Countries" Final Report commissioned by DG Employment and Social Affairs presented by MKW Wirtschaftsforschung GmbH.

Table 15: Cost to in-commuters per annum, €bn

	Estimates
Time delay, minutes	13 - 47
Total number of in-commuters per day	777,537
Cost to in-commuters, €bn	1.7 – 6.1

Note: In-commuters data is for 2006 for Schengen countries to the EU-15 or EU-12. For missing country values, averages were used. Wages used are for each country.

Time delay costs to tourists

In the year 2014, the number of out bound trips to EU-28 countries from Schengen Member states excluding domestic trips were around 143.5m. With border controls, the time taken for each journey is likely to increase by approximately 13 minutes and at max by 47 minutes.[20] Assuming the time value of money being equal to the average hourly wage, and that the average hourly wage of a tourist is one twenty-fourth that of a worker in countries visited[21], the estimated cost to tourists due to time delays at the border comes out to between €18m to €49m per year. For two year Schengen control, this comes out to be between €36m to €98m.

Table 16: Cost to tourists, €m

	2014
Number of tourists from EU-28 excluding domestic tourists, m	143.5
Time value of money, €/hour	13/24
Cost to tourists, €m	18.3 - 48.9

Time delay costs of road freight

At present, road freight can move freely between Schengen Member States without any security clearance or custom duty checks. With border controls, the time for road freight to reach its destination country is likely to increase. We estimate the time delay costs to freight transport in two scenarios: one with 30 min delay and the other with an hour of delay.

The value of time in goods is estimated to be €0.6 per hour per ton for France. Assuming the value of goods is likely to differ by Member States according to their purchasing power parity, we scaled the French estimate to calculate the value of time in

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[20] Estimate taken from earlier study conducted by Europe Economics on the costs of Scotland leaving the UK and becoming part of the Schengen agreement. http://europeanreform.org/files/New_Direction_-_EU-Related_Impacts_of_Scotland_Leaving_the_UK.pdf

[21] See footnote 17.

goods for each Schengen State. Table below shows an average value of €0.5 per hour per ton across the Schengen zone.

The value for hauler is €37 per hour for France. We have assumed this to be similar across the Schengen area.

In the first scenario with half an hour of delay, the estimated freight delay costs are €3.6bn for international goods loaded in Member State (exported to other countries) and €3bn for goods unloaded in Member State (imported from other countries) on an annual basis.

For two year Schengen control, this cost will double amounting to €7.2bn for international goods loaded in Member State and €6bn for goods unloaded in Member State.

Table 17: Cost to road freight transport of half an hour delay, €m

	International goods loaded	International goods unloaded
Volume of goods, million tons	385	321
Number of lorry crossings in a year, m[22]	187	156
Value of time in goods[23], €/hour/ton	0.53	0.53
Value of time for hauler[24], €/hour/lorry	37	37
Additional delay at the border, hour	0.5	0.5
Cost in goods, €m	96	80
Cost for hauler, €m	3,464	2,886
Total cost, €m	3,560	2,966

Notes: The cost in goods is derived from a calculation based on volumes in each country and the value of time in goods in each country. The values reported here are averages, meaning that there will be small differences obtained by calculating the total from the values in this table — e.g. 385m x €0.53 x 0.5 hours = €102m not €96m, the value obtained by summing across the separate calculations for each country.

In the second scenario with an hour of delay, the estimated freight delay costs are €7.1bn for international goods loaded in Member State (exported to other countries) and €5.9bn for goods unloaded in Member State (imported from other countries) on an annual basis.

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[22] The number of lorry crossings are estimated based on the total volume of goods traded and average lorry capacity. Average lorry capacity is estimated using the data on lorry size and number of lorries from Eurostat. We have constructed an estimate of 2.1 tonnes for the average lorry's capacity.

[23] The value of time in goods was €0.6/hour/ton for France (taken from France Strategie http://blog.en.strategie.gouv.fr/wp-content/uploads/2016/02/FS_-NA39_Schengen-english.pdf). For rest of the Schengen Member states, we adjusted this value with purchasing power parity index from IMF.

[24] The value of time for hauler was €37 per hour per lorry taken from http://blog.en.strategie.gouv.fr/wp-content/uploads/2016/02/FS_-NA39_Schengen-english.pdf

In two years, the cost will double; €14.2bn for international goods loaded and €11.8bn for goods unloaded in Member State.

Table 18: Cost to road freight transport of an hour delay, €m

	International goods loaded	International goods unloaded
Volume of goods, million tons	385	321
Number of lorry crossings in a year, m	187	156
Value of time in goods[25], €/hour/ton	0.53	0.53
Value of time for hauler[26], €/hour/lorry	37	37
Additional delay at the border, hour	1	1
Cost in goods, €m	192	160
Cost for hauler, €m	6,928	5,772
Total cost, €m	7,120	5,932

Drawing upon the figures above, in this scenario one-off costs, annual costs and the cost over the full two-year period under consideration, for all the Schengen member states are as follows.

Table 19 Total cost ranges of the scenario

Scenario for Schengen suspension	One-off costs (€bn)	Ongoing annual costs		Total cost (2 years)
		% of GDP of 26 affected countries	% of EU GDP	(€bn)
All countries two-year	7.1	.07-.16%	.06-.14%	25-50

These figures are calculated as follows:
- €16.9 per capita, over the 420m citizens of the Schengen states that introduce new land borders produces a one-off cost of creating a border of €7.1bn.
- Ongoing annual costs, across the Schengen countries, are obtained by summing the totals for commuters, tourists, imported freight and exported freight. For the minimum cost scenario this sums to 0.07-0.16% of the GDP of the Schengen Member States, or 0.06-0.14% of EU GDP.
- Over a two year period the total of these figures is €26bn-€51bn. So, for example, €7.1bn + 0.07 per cent x Schengen GDP in 2016, €13.0tr (€9.4bn) + 0.07

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[25] The value of time in goods was €0.6/hour/ton for France (taken from France Strategie http://blog.en.strategie.gouv.fr/wp-content/uploads/2016/02/FS_-NA39_Schengen-english.pdf). For other Schengen Member states, we adjusted this value via IMF purchasing power parity index.

[26] The value of time for hauler was €37 per hour per lorry taken from http://blog.en.strategie.gouv.fr/wp-content/uploads/2016/02/FS_-NA39_Schengen-english.pdf

per cent x Schengen GDP in 2017, €13.3tr (€9.6bn) = €26bn for the lower end of the range, which we round to €25bn.[27]

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[27] Source for Schengen GDP forecasts for 2016 and 2017: Europe Economics projections based upon Eurostat 2014 data.

Chapter 6 - Impacts of complete Schengen suspension scenarios

Key findings

- We estimate a range of 110-275 bps range for sovereign bond yield spreads as the impact of ceasing to be seen as core to the euro project, in the event of an indefinite exclusion from Schengen.
- The excess payments the countries will have to pay on their outstanding debts to compensate the creditors for their increased default risk are likely to vary between €331m for Slovenia and €8.7bn for Greece.
- There is not sufficient evidence to suggest that exiting the Schengen area will lead to either depreciation of currency or exchange rate volatility for the Member States leaving Schengen in the first scenario.
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Table 20: Total costs of indefinite Schengen suspension

Scenario for Schengen suspension	One-off costs (€bn)	Cost to commuters (annual)	Cost to tourists (annual)	Cost to road freight (annual)	Macro cost (annual)	Fiscal cost of elevated yields (annual)	Total cost (10 years)*
		(€bn)	(€bn)	(€bn)	(€bn)	(€bn)	(€bn)
Limited permanent	0.7	0.2-0.6	0.005-0.02	0.7-1.3	2.2	12.1-30.2	30-40 growth + 120-300 fiscal
All countries permanent	7.1	1.6-6.1	0.02-0.05	6.5-13	-	-	100-230

Note: *10 year costs projected over next two years GDP.

I - Narrative description of impacts

If a subset of current Member States, (the six Member States discussed in the previous section with temporary border controls –Austria, Denmark, Hungary, Slovenia, Norway and Sweden) and Greece were to exit the Schengen zone indefinitely, then there is a risk that these Member States might be no longer seen as central to the EU project. This could possibly affect their bond yields and exchange rate volatility.

There are three potential aspects to this. First, if countries are no longer seen as central to the EU project (since excluded from Schengen), that could have implications for how their status in other aspects of the EU project is seen. For example, if they are not core

to the EU, they may not be essential members of the euro either. That could lead to a perceived risk that, under stress, these countries might either choose to leave the euro or be invited to do so by more core EU members. That could lead to increased risk premia on euro-denominated assets in those countries, since those assets might now carry redenomination risk. That would include government bonds but would also include other assets falling under national law (and as such subject to the *lex monetae* principle).

Second, one could imagine a perceived enhanced risk that in a period of fiscal distress, an EU sovereign that was not part of the core EU might be less likely to receive emergency loans from core EU members. That could have implications for bond yields over-and-above the implications associated with redenomination risk. Indeed it might even apply to countries that are not members of the euro.

Third, one could imagine that countries that have committed to joining the euro but not yet joined might be seen as less likely ultimately to join, with implications for the stability of the exchange rate of their existing currency versus the euro.

II - Quantitative estimation

In the sections below, we estimate the impact of the Schengen area being suspended indefinitely.

1. Scenario 6.1: Indefinite exclusion from the Schengen system of a subset of current members

In the sections below, we discuss the impacts, if any, of indefinite exclusion from the Schengen zone of these seven countries.

Redenomination risk and bond yields

If some member countries leave the Schengen system, financial markets might interpret that as a signal that those countries are not central to the EU project. This could in turn means that in periods of fiscal crisis, there is perceived to be a lower probability that other countries will provide emergency loans and/or increased redenomination risk.
Historic evidence suggests that redenomination risk leads to higher yields for government bonds. According to the ECB, during the 2011-2012 crisis, even certain long-established Eurozone countries (Italy, Spain and France) experienced higher bond yields, part of which could be attributed to redenomination risk.[28] The key results from the ECB study were as follows:

- The impact of redenomination risk was relatively large reaching the peak for sovereign yield spreads at 200 basis points for Italy, 275 basis points for Spain and 35 basis points for France implying that during the first quarter of 2012

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[28] https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1785.en.pdf

about 30%, 40% and 50% of the respective French, Italian and Spanish sovereign credit spreads could be explained by redenomination risk shocks.

- During the peak of the crisis in July 2012, redenomination risk shocks accounted for about 165 basis points (28%) of Italian, 270 basis points (39%) of Spanish and 13 basis points (28%) of French 5-year sovereign yield spreads respectively.

- After President Draghi's speech in July 2012, the role of redenomination risk as perceived by the market became gradually and steadily smaller and by the end of 2013 its contribution sovereign yield spreads amounted to 110 basis points in Italy, 160 basis points in Spain and 2 basis points in France.

Accounting for this evidence, we estimate a range of 110-275 bps range for sovereign bond yield spreads as the impact of ceasing to be seen as core to the euro project, in the event of an indefinite exclusion from Schengen. We treat the lower end of the range (110 bps) as the long term perceived risk while the upper end (275 bps) is the risk associated with periods of fiscal distress.

Using this range of perceived default risk, we estimate the additional costs the three of these 7 States that are members of the euro are likely to face on their outstanding debts over the years, once those debts are fully refinanced. The costs are estimated as the excess payments the countries will have to pay on their outstanding debts to compensate the creditors for their increased default risk. Table below shows that these vary between €331m for Slovenia and €3.5bn for Greece in the long-term perceived risk addition scenario of yields elevated by 110bps, whilst they vary between €829m for Slovenia and €8.7bn for Greece in the periods of fiscal distress scenario of yields elevated by 275bps.[29]

Table 21: Cost of perceived default risk associated with exiting the Schengen area indefinitely

Country	Gross outstanding debt, €m	Increased yields of 110 bps, €m	Increased yields of 275 bps, €m
Austria	277,383	3,051	7,628
Slovenia	30,133	331	829
Greece	317,117	3,488	8,721

Increased government bond yields associated with redenomination risks might imply elevated real interest rates across the economy, since redenomination would affect all national debt contracts. Higher real interest rates arising from this source would be likely to mean lower investment and lower GDP growth.

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[29] We acknowledge that the assumption that impacts would be the same for Austria, Slovenia and Greece is a strong one, but leave more detailed analysis of differences between them for future research.

We can estimate by how much using the following approximate figures. Let us suppose that:

- Average asset life is 12 years
- The average cost of capital is initially 7 per cent, rising to 8.1 per cent once redenomination risk raises the cost of capital by 110 basis points.
- Investment exhibits unit elasticity to changes in the cost of capital — i.e. investment falls so as to keep the total amount spent, including investment and capital servicing costs, constant.

So, to illustrate, suppose that total investment is indexed to 100 units initially. Then over 12 years, at a 7 per cent interest rate, the cost will be 184 units. If, instead, the cost of capital is 8.1 per cent, the cost rises to 197.2 units — a rise of 7.2 per cent. If investment falls so as to keep total costs constant, it will fall by 6.7 per cent.[30]

In 2015, investment in the euro area was 19.1 per cent of GDP.[31] That implies that a fall in investment of 6.7 per cent would mean a fall in GDP of 1.3 per cent.

Exchange rate volatility and commitment to the euro

Data on the exchange rates of countries that joined the EU in 2005 (the largest accession) but have not yet adopted the euro (i.e. Hungary, Poland and Czech Republic) shows that joining the EU and thus commiting to joining the Euro did not lead in any straightforward way to reduced exchange rate volatility, as can be seen below from the table. Indeed, if anything the straightward result was an increase in volatility (though we do not have any strong reason or evidence to suggest that this effect is causal — at least in the sense relevant for this Research Paper[32] — and do not use it subsequently).

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[30] 1.072 x 0.933 = 1.

[31]

https://www.imf.org/external/pubs/ft/weo/2015/02/weodata/weorept.aspx?pr.x=77&pr.y=13&sy=2005&ey=2015&scsm=1&ssd=1&sort=country&ds=.&br=1&c=163&s=NID_NGDP&grp=1&a=1

[32] According to one study, large amounts of foreign capital expected to flow into the accession countries pushed the national currencies toward appreciation. "Exchange rate volatility tends to be increased, which can be avoided only by subordinating all monetary instruments toward the objective of exchange rate stability." https://www.mnb.hu/letoltes/exchange-rate-policies-on-the-last-stretch.doc

Table 22: Exchange rate volatility to the euro

Standard deviation of national currency to the euro	Czech Republic	Poland	Hungary
Jan 2003-April 2004	0.0005	0.012	0.0001
May 2004 –Dec 2006	0.2	0.0	0.03

Table 23: Exchange rate volatility to USD

Standard deviation of national currency to USD	Czech Republic	Poland	Hungary
Jan 2003-April 2004	0.002	0.007	0.0002
May 2004 –Dec 2006	0.3	1.1	0.03

We conclude that there is not sufficient evidence to suggest that exiting the Schengen area will lead to increased exchange rate volatility for Member States with a Treaty commitment to join the euro that have not yet joined.

Drawing upon the figures above, in this scenario one-off costs, annual costs, the fiscal and macroeconomic growth cost of the perceived default risks and the cost over the full ten-year period under consideration, for the seven affected Schengen member states are as follows.

Table 24 Total cost ranges of the scenario

Scenario for Schengen suspension	One-off costs (€bn)	Ongoing annual costs		Total cost (10 years)
		% of GDP of seven affected countries	% of EU GDP	(€bn)
Limited permanent	0.7	.05 -.1% GDP level + 0.13% lower GDP growth + 0.4%-1% fiscal cost	.006-0.014% GDP level + 0.01% lower GDP growth + 0.05-0.12% fiscal cost	55-70 GDP + 70-170 fiscal

These figures are calculated as follows:

- €16.9 per capita, over the 41m citizens of the Schengen states that introduce new land borders produces a one-off cost of creating a border of €0.7bn.
- Ongoing annual costs, across the seven affected Schengen countries, are obtained by summing the totals for commuters, tourists, imported freight and exported freight and the macro costs of the perceived default risk (macro cost is also included for Greece). For the minimum cost scenario, this sums to €1bn and for the maximum cost scenario the sum is €2bn per annum. These in turn constitute 0.05-0.1% of the affected countries' GDP, or 0.006-0.014% of EU GDP.

- The fiscal costs are calculated as the additional interest costs on gross outsanding debt of the 3 Schengen countries, of our seven, that are members of the euro (Austria, Greece and Slovenia) due to the elevated bond yields of 110 bps and 275 bps in the low and high end scenario respectively. So for example, the low end scenario of 110 bps elevated bond yields and a gross debt of €625bn gives a fiscal cost of €6.9bn per annum and the high end scenario of 275 bps elevated bond yields gives a fiscal cost of €17bn per annum. These in turn constitute 0.4% to 1% of the GDP of the seven affected countries in the scenario as a whole and 0.05-0.12% of EU GDP.
- Over a ten year period the total cost is €55bn-€70bn in GDP and €70-170bn in fiscal costs. So, for the lower end of the GDP range, the growth cost is calculated as follows: €0.7bn + 0.05 percent of GDP in each of ten years for the seven affected countries + lost annual GDP of 0.013 in each of the three affected countries over ten years = €55bn.[33]

We emphasize that in this table the figures should not be regarded as additive. Lost time weighting to transport goods across a border is lost GDP – the resources kept idle waiting at the border could have been used generating additional output. But additional fiscal costs are not lost GDP. They constitute a transfer from one set of EU citizens to another.[34] But way of analogy, consider the impacts of a house price rise. There is a transfer from buyers to sellers (the buyers pay more; the sellers receive more) but that transfer is not in itself lost growth.

Higher house prices could induce macroeconomic impacts via various routes. In the same way, there could be macroeconomic implications if the government must pay higher debt servicing costs. There is one set of such impacts we do not model — lost GDP (and perhaps also lost GDP growth) associated with deadweight losses from tax distortions created when taxes are higher. But there is another set of GDP losses which are not the direct effect of the fiscal changes but arise from the same source — namely that redenomination risk increases borrowing costs for private sector investors as well as for the government. That increased cost results in lower investment (as per the calculation above). We treat that 1.3 per cent drop in GDP of the affected countries from lower investment, by the tenth year, as a loss of growth of 0.13 per cent per year. That 0.13 per cent of the GDP of the seven affected countries is equivalent to 0.01 per cent of EU GDP.

2. Scenario 6.2: Indefinite suspension of the Schengen system for all members

In a scenario where the entire Schengen system ceases to exist, there would the costs of creating a border and the ongoing costs for tourists, commuters and goods transporters

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[33] The source for our GDP figures is Eurostat for 2014 data, with projections over the ten years from Europe Economics.

[34] We acknowledge that there is some additional complexity here when non-EU citizens hold EU debts but we set that point aside for now.

of time delays at the border. The border costs would be spread over a longer period (instead of those border costs being borne for only the two years of a temporary suspension) and thus the effective annual burden would be reduced.

On the other hand, total suspension of the Schengen area might be interpreted by investors as being a set-back for the European project as a whole, enhancing the risk of reversal on other existing programmes (or reduced certainty of new programmes implemented in future), creating an added element of "regulatory risk"for investors.

For our purposes here we do not attempt to quantify the added "regulatory risk" element (which we in any event believe would be quite small in this case). The quantitative impact is therefore simply an indefinite extension of the annual costs identified under Scenario 5.2 but with the costs of erecting a border spread out over additional years.[35] This is detailed in the table below.

Table 25 Total cost ranges of the scenario

Scenario for Schengen suspension	One-off costs (€bn)	Ongoing annual costs		Total cost (10 years)
		% of GDP of 26 affected countries (Schenged area)	% of EU GDP	(€bn)
All countries permanent	7.1	.07-.16%	.06-.14%	100-230

These figures are calculated as follows:
- €16.9 per capita, over the 420m citizens of the Schengen states that introduce new land borders produces a one-off cost of creating a border of €7.1bn.
- Ongoing annual costs, across the Schengen countries, are obtained by summing the totals for commuters, tourists, imported freight and exported freight. For the minimum cost scenario this sums to 0.07-0.16% of the GDP of the Schengen Member States, or 0.06-0.14% of EU GDP.
- Over a ten year period the total of these figures is €100bn-€200bn. So, for example, €7.1bn + 0.07 per cent x GDP of Schengen area over 10 years, €140tr = €102bn for the lower end of the range, which we round to €100bn.

We note that, whereas in the case of limited Schengen suspension, we adjuded that there could be additional macroeconomic growth (lost investment) and fiscal costs, in the case of full Schengen suspension we do not model such costs. The key reason for this is that we judge that markets would be more likely to regard a partial suspension of Schengen as a signal that some members were regarded differently from others (and in particular regarded as less central components of the EU's "core"), than would be the case for total suspension. Therefore total suspension would be less likely to create material redenomination risk. We have acknowledged above that there could be some

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[35] In the summary Table 18 in the Conclusions section below we report a case in which indefinite costs and the costs of the border are aggregated over 10 years.

theoretical added "regulatory risk" created by full Schengen suspension (and attempting to quantify such risks could be a possible extension of our models here), but in our view that would be unlikely to be large compared with the effects we have identified for the indefinite limited Schengen suspension case.

Chapter 7 – Conclusion

In

Table 26 we summarise costs across the various scenarios. We note that in Scenario 3, as well as the growth cost, we report the fiscal cost (the cost to the government associated with paying a higher interest rate on its debts). This fiscal cost will not in itself constitute a growth cost insofar as government bonds are owned by citizens of the country concerned, since such payments are only an internal transfer. There could be GDP costs associated with the taxes raised by the government to service higher debt payments but we do not attempt to estimate those here.[36]

Aggregated cost is presented as a percentage of the aggregated GDP over the affected Schengen members as well as over the GDP of the EU as a whole. In terms of millions of euros, the largest mid-point cost is associated with a permanent non-Schengen scenario where all countries exit (Scenario 6.2) which ranges between €100bn and €230bn euros.

Table 26 Total cost ranges of the scenarios

Scenario for Schengen suspension	One-off costs (€bn)	Ongoing annual costs		Total cost (2 years/10 years)**
		% of GDP of affected countries*	% of EU GDP	(€bn)
Limited two-year	0.7	0.13-0.30%	0.006-0.014%	2.5-5
All countries two-year	7.1	0.07-0.17%	0.06-0.14%	25-50
Limited permanent	0.7	0.05 -0.1% GDP level + 0.13% lower GDP growth + 0.4%-1% fiscal cost	0.006-0.014% GDP level + 0.01% lower GDP growth + 0.05-0.12% fiscal cost	55-70 GDP + 70-170 fiscal
All countries permanent	7.1	0.07-0.16%	0.06-0.14%	100-230

Notes: * Affected countries differ between scenarios. For the "All countries" scenarios there are 26 affected countries (the Schengen area). For the "Limited two-year" scenario there are six countries affected. For the "Limited permanent" scenario there are seven countries (Greece is excluded from the first as it lacks a land border with any other Schengen member).
** The "Limited two-year" and "All countries two-year" scenarios for Schengen suspension are calculated as the total cost for 2 years and the "Limited permanent" and "All countries permanent" scenarios are calculated as the total cost over 10 years. The final column is rounded.

We observe that our estimates for full Schengen suspension, represent lost GDP of around 0.06-0.14 per cent of EU GDP annually. These constitute a levels impact, and do not reduce growth rates. Our figures are very similar to those of the European

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[36] The option of estimating the growth implications of higher taxes could be an option for a more developed modelling exercise in a longer project.

Commission, at 0.05-0.13 per cent (in levels). They are considerably less than those in studies that show a large impact on GDP growth rates, such as the Bertelsmann Stiftung where there is a 0.12 percentage point fall in annual growth rates, summing to over 1 per cent of Schengen area GDP by 2025 — an impact around an order of magnitude higher than those we find here.[37]

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[37] We observe that although the increased costs of trade and travel that we identify could in principle have the implication of reduced trade and less interaction via travel, with possible implications for growth rates as well as levels (e.g. because less interaction meant less exposure to new ideas). However, one would normally expect impacts on growth rates associated with levels impacts of this sort to be one to two orders of magnitude less than the levels impact. It therefore seems implausible to us that a result such as that in the Bertelsmann Stiftung study would arise from extending our analysis here to its implications for growth rates. Large growth rates effects would require a different mechanism.

We also observe that that Bertelsmann Stiftung estimate of a 0.12 percentage point annual growth rate loss is close to our estimate for lost annual GDP growth, amongst the three most affected countries, in our scenario of indefinite suspension for that group (0.13 percentage points).

This paper considers the costs of four scenarios for the reintroduction of border controls within the Schengen area: for two years for seven countries; for two years across the Schengen area; indefinitely for seven countries; and indefinitely across the Schengen area. It identifies how a reintroduction of borders would create costs of 'non-Schengen' and estimates that cost quantitatively. For the highest-cost scenario — indefinite suspension of the whole Schengen area – the cost is 0.06-0.14 per cent of EU GDP, or some €100 billion to €230 billion over ten years