

THE EURASIAN ECONOMIC UNION: IN SEARCH FOR OPTIMALITY IN THE POST-SOVIET SPHERE

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ABSTRACT

This paper evaluates the economic feasibility of introducing a shared currency within the Eurasian Economic Union – a regional project aimed at the economic integration of Armenia, Belarus, Kazakhstan, Kyrgyzstan and Russia. The costs and benefits of sharing legal tender are weighed by assessing the proposed currency area's chances of avoiding or mitigating asymmetric shock. This is done by applying Optimal Currency Area theory to the economic conditions of the Union and to those of each individual state. The analysis finds that it is likely that a Eurasian currency area will suffer from asymmetric shocks. The Union's elevated risk of being struck by shock comes from major dissimilarities between the countries' economies. The economic conditions of the countries in question also indicate that they are not in possession of the tools needed to adjust for asymmetric shocks, were they to happen. The paper concludes that the formation of a mutually beneficial currency union between the current members of the Eurasian Economic Union is not supported by Optimal Currency Area theory. The conclusion drawn from the analysis thus implies that these post-Soviet states should retain monetary sovereignty, as a floating currency allows them to mitigate asymmetric shocks through exchange rate adjustments.

KEYWORDS: OPTIMAL CURRENCY AREA, EURASIAN ECONOMIC UNION, MONETARY POLICY, CURRENCY UNION, MACRO-ECONOMICS

JEL: E52, E63, F45, O52, O53

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DATE SUBMITTED:	14 MAY 2017
DATE EXAMINED:	2 JUNE 2017
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ACKNOWLEDGEMENTS

We would like to express our gratitude to our supervisor Assistant Professor Federica Romei for her support. We would also like to highlight the valuable feedback that we have received from our peers Agnes Magnusson, Ida Wallin, Veronica Nelson and Viktoria Serreau.

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1 INTRODUCTION

A currency union within the Eurasian Economic Union has been proposed by the Russian president. Provided that this proposal gains traction, the potential benefits of a shared monetary arrangement become important to analyse. Since the dissolution of the Soviet Union, there has been an on-going discussion on the political implications of deeper economic integration in the post-Soviet sphere. However, the economic aspects of further integration have not drawn the same level of interest. The purpose of this paper is thus to study the economic feasibility of introducing a shared currency within the Eurasian Economic Union.

The economic viability of such a common monetary policy arrangement is evaluated by looking at the proposed currency area's ability to pre-empt and/or withstand asymmetric shock. This is done by examining criteria defining an Optimal Currency Area (OCA). In short, an OCA is a region consisting of entities (usually, countries) that are maximising their welfare by adhering to the same monetary policy. Whether an area is optimal or not can be evaluated by using a number of variables or indicators derived from OCA theory. This paper studies: i) each country's degree of wage flexibility, ii) each country's level of production diversification, iii) production structure similarities between all countries, iv) the mobility of factors of production within the currency area, v) the countries' co-variation in economic activity, vi) fiscal and monetary policy similarities between all countries, and vii) other political factors affecting a common currency's chances of success. While the results are partly inconclusive, the findings of this paper indicate that an economically beneficial currency union between Armenia, Belarus, Kazakhstan, Kyrgyzstan and Russia is not supported by the countries' economic conditions. The analysis suggests that a currency union between these five countries would experience difficulties with resisting asymmetric shock. The formation of a currency area would hence lead to high costs that are unlikely to be outweighed by potential economic benefits to participating states. A common currency lacks economic feasibility.

This paper studies a suggested currency area within the already established Eurasian Economic Union (the 'EEU', the 'Union'). The EEU is a regional project aimed at the economic integration of the post-Soviet states. So far Armenia, Belarus, Kazakhstan, Kyrgyzstan and Russia have joined the union and formally taken steps towards facilitating intra-regional trade through the realisation of a single market. In addition to promoting

trade, the EEU names macro-economic and monetary policy co-ordination as areas of deeper future co-operation. Beyond what the five countries have agreed upon in the founding treaty of the EEU, Russian president Vladimir V. Putin has presented the aforementioned suggestion on the formation of a common currency and thus a monetary union. The Russian president's proposal has, however, so far failed to muster support in the remaining capitals of the EEU (Kim 2015).

The formation of the EEU picks up where previous projects with the same espoused aim of economically benefitting the participating states have failed. Previous experience has shown that Russia's hegemony in the region has occasionally forced Russian ambitions on neighbouring states, for example through trade distortive tariff schedules. Russia's illegal annexation of Ukrainian territory and the continuing war that is being waged in the Donbas are thought to be results of the same trade-related ambition as the expansion of the EEU (Popescu 2014). The Donbas and the EEU both are considered by experts to be manifestations of Moscow's assertiveness and willingness to increase Russia's influence in the ex-Soviet states and in the global arena. The EEU has subsequently faced criticism (see, for instance: Åslund 2013, Popescu 2014, Popescu 2015, Standish 2015 and Kubayeva 2015). The notion of the EEU not being an economically feasible project in its current form begs the question whether there are economic net benefits to taking the co-operation even further. Would the construction of a common currency benefit the Union's members? While a shared currency may reduce transaction costs and facilitate trade, it may also come at significant cost as it is in a currency union impossible to conduct independent monetary policy. This is why it is of interest to assess whether the proposed steps toward further Eurasian integration through a currency union are backed up by economic theory.

Outline

In the following second section of this paper, the reader is provided with a political and historical background of the countries and the region in question. The subsequent section contains an OCA theory literature review in which the relevant contributions to the field are discussed. The research question of this paper, its aim and its scope are provided after the literature review, before a data analysis based on the method is conducted in section five. The findings of the fifth section are concluded and discussed in sections six and seven before the entirety of the paper is summarised in section eight.

2 BACKGROUND

The political aspects of the EEU have been widely discussed within the field of political science, yet the actual economic impact of an even deeper Eurasian integration has not received the same amount of attention. Before addressing the economic consequences of a Eurasian currency, the following section sets the political, macro-economic, historical and cultural stage of the EEU and its member states.

Macro-economic indicators

In order to provide an understanding of the economic characteristics of the Eurasian Economic Union's member states, table 2.1 shows a selection of key macro-economic indicators. The table illustrates five countries of different size and wealth. Notable is the significant differences to population, the size of the agricultural and manufacturing industries, GDP, GDP per capita and annual inflation rates.

Table 2.1

	Macro-economic indicators				
2015	ARM	BLR	KAZ	KGZ	RUS
GDP at market prices (constant 2010 US dollar, million) ¹	11,457	58,591	186,260	6,059	1,616,147
GDP per capita (constant 2010 US dollar) ¹	3,797	6,159	10,617	1,017	11,039
Gross capital formation (% of GDP) ¹	20.8%	30%	N/A	34.7%	20.7%
General government gross debt (% of GDP) ²	46.9%	53.7%	21.9%	66.0%	16.4%
Official exchange rate (LCU per US dollar, period average) ¹	477.9	1.6	221.7	64.5	60.9
Inflation, consumer prices (2015 annual %) ²	3.7%	13.5%	6.5%	6.5%	15.5%
Agriculture, value added (% of GDP) ³	21.7%	8.4%	4.8%*	16.9%	17.3%**
Manufacturing, value added (% of GDP) ³	9.9%	23.9%	11.2%*	13.7%	17.7%**
Population (total, million) ¹	3	9.5	17.5	6	144.1
National currency	Dram	Belarusian ruble	Tenge	Som	Russian ruble
Exchange rate regime*** (de jure) ⁴	Free floating	Managed floating	Managed floating	Managed floating	Floating
Exchange rate regime (de facto)	Floating	Other managed	Floating	Other managed	Free floating
Monetary policy framework	Inflation-targeting	Monetary aggregate target	Inflation-targeting	Other	Inflation-targeting

*Data from 2014, **Data from 2013, ***IMF classifications here and below as of April 2016. Sources: ¹World Bank (2015), ²World Economic Outlook (IMF 2016), ³United Nations Statistic Division (2015), ⁴Annual Report on Exchange Arrangements and Exchange restrictions (IMF 2016)

The ruble area experience of 1991–1993

During the hasty demise of the Soviet Union, Moscow's political influence over the Soviet republics was rapidly lost as they regained their independence. The disbandment of the common monetary policy regime of the Soviet Union was, however, not as immediate. After the Soviet Union's formal dissolution in late 1991, the Soviet republics temporarily kept the Soviet currency; they remained members in the so called 'ruble area'. In the first years of the 1990s, the common ruble was emitted by the State Bank of the USSR (the *Gosbank*) in Moscow. The Gosbank's mandate to issue currency was then handed over to the Central bank of Russia (CBR). Meanwhile, in the surrounding republics, the former branches of the Gosbank became the national central banks of the former Soviet republics. During this period of a de jure common currency area, the CBR printed and distributed money to the republics' central banks. However, while ruble notes and coins were printed and distributed by the CBR, each central bank retained an ability to set credit growth rates different to those of the CBR. Thus, during the early 1990s, the deficits in the former Soviet republics were financed through seigniorage – credit issued by each respective central bank (Odling-Smee and Pastor 2001).

The ruble currency area did not survive for long. The Baltic states and Ukraine were the first to launch their own currencies in 1992. Kyrgyzstan introduced its own currency in May 1993, while Belarus, Armenia and Kazakhstan followed suit later the same year. By the end of 1993, Tajikistan was the last country to remain in the currency area, alongside with Russia. Odling-Smee and Pastor (2001, p. 9) write in their report on the ruble area that

When these countries realized the possibility of destabilizing cross-border flows of old rubles from other states and Russia's unwillingness to speed up monetary unification and provide them with new rubles, all, except Tajikistan, introduced national currencies by November 1993.

Not only nationalist sentiment arising from the states' newly won independence caused them to leave the Soviet ruble. The dissolution of the common currency is also explained by the former Soviet countries' inability to co-ordinate policy measures. During the time of the ruble currency area, inflation spread throughout the region as national governments ran expansionary credit policies. Meanwhile, a great shortage in cash (caused by disruptions in the deliveries of bank notes from the CBR combined with vast inflation) resulted in countries issuing their own multi-purpose coupons working as legal tender alongside the

ruble. This led to a de facto creation of national currencies that existed in parallel to the shared one (Odling-Smee and Pastor 2001).

Renewed steps towards economic integration

Soon after the disbandment of the Soviet Union, steps were taken towards integrating the newly independent economies of Central Asia and Eastern Europe.

In 1996 Belarus, Kazakhstan, Kyrgyzstan and Russia deepened their economic ties through a customs union, which later developed into the Eurasian Economic Community in the year 2000. Through this early customs union, the participating countries established a common schedule of external tariffs that was supposed to be imposed on third part countries. The tariff schedule consisted of the same external ‘comparatively protectionist’ tariffs that were employed by Russia at the time (Åslund 2013, n.p.). This caused a trade diversion that benefitted Russia while it negatively affected countries that previously had been relatively open. This balance of payment cost incentivised participating states to disregard many of the agreed upon tariff rates. As there was, as Tarr (2016, p. 3) describes it, ‘little to the [Eurasian Economic Community] customs union beyond the ineffectual common external tariff’, the custom union members soon lost interest in the co-operation, and it failed.

Picking up where the failed Eurasian Economic Community left off, a new customs union (also based on Russian tariff schedules) between Belarus, Kazakhstan and Russia was launched in 2010. The Customs Union (CU) was then developed into the common economic space (CES) in 2011. Through the CES, the countries deepened their economic integration by agreeing to the principle of the four freedoms¹ and thereby paved the way for what was to become the next step of economic integration between the countries: the Eurasian Economic Union (EEU) (Eurasian Economic Commission 2016).

The Eurasian Economic Union

The treaty of the EEU was signed in 2014. The treaty is described as a codification of the common regulatory and legal framework that had been developed in the preceding years, mainly through the treaties on the Customs Union and the Common Economic Space. The union was formally created at the onset of 2015, with Armenia and Kyrgyzstan joining

¹ The freedom of movement of goods, services, capital and labour.

later the same year. The EEU constitutes an international legal entity with the espoused goal of supporting the participating economies, mainly through the realisation of a single market (Eurasian Economic Commission 2016).

The EEU is comprised of a pyramidal structure. The Supreme Council of the EEU is the top decision-making authority of the Union. It gathers the presidents of the participating republics. Decision making requires unanimity. The second highest decision making entity is the Intergovernmental Council consisting of the member states' prime ministers, which in turn is followed by the executive regulatory authority: the Eurasian Economic Commission (EEC). In parallel, the Court of the EEU enforces compliance with the treaty. The EEU is a project that seemingly goes further than any previous endeavour to integrate the region's independent economies.

The EEU is still in its infancy and the formation of a single market remains far from complete. Starting with the Customs Union and the Common Economic Space, the countries have de facto and de jure taken steps towards realising a single market for goods. De jure efforts have been directed at removing both tariff and non-tariff barriers to trade between the participating nations. The measures that have already been formally adopted by the CU, CES and the EEU include the common tariff schedule for third country, the formal removal of customs posts between the member states, the development of common standards and norms on goods and the monitoring of competitive conditions within the supposed common market. Moving beyond the goal of a free market of goods, the formation of the EEU – at least formally – created a common labour market. In the future, the EEU is supposed to realise a single market for energy, services and financial services (Eurasian Economic Commission 2016).

Macro-economic and monetary policy co-ordination within the EEU

The treaty on the Eurasian Economic Union stipulates that the Common Economic Space entails an increased co-ordination of macro-economic policy. The mandate to co-ordinate these joint efforts has been assigned to the EEC, while the right to conduct macro-economic and monetary policy remains regulated at national level within the jurisdictions of each state and its national central bank. Included in the treaty on the EEU are a number of macro-economic prerequisites similar to the Maastricht criteria of the European Economic and Monetary Union (EMU). The EEU agreement includes budget deficit

targeting (no more than 3% of GDP), a public sector debt ceiling target (no more than 50% of GDP) and inflation rate targeting (annual inflation rates may not exceed the union members' lowest inflation rate by more than five percentage points) (Eurasian Economic Commission 2016).

In the monetary policy arena, the treaty contains an intention to increase co-ordination. As found in research conducted jointly by the EEC and the Eurasian Development Bank (EDB) through Demidenko et al. (2017), there are at present time differences between the monetary policies followed by EEU member states. The report underscores that further co-ordination of policy will require the formulation of common goals and the definition of 'implementation mechanisms' (Demidenko et al. 2017, p. 3). They find that a realisation of co-ordinated monetary policies may reduce the vulnerability of the economy of the region. Further, the authors describe the EEU member states' setting of mid-term inflation targets as a step towards aligning monetary policy. However, the determined medium-term target rates vary (see table 2.2).

Table 2.2

EEU inflation targets					
	ARM	BLR*	KAZ*	KGZ**	RUS
Inflation target	4%	5%	3-4 %	5-7 %	4%

*Medium term (2020), **Medium term (target year not specified). Source: Central Bank of Armenia (2017), National Bank of the Republic of Belarus (2017), National Bank of Kazakhstan (2017), National Bank of the Kyrgyz Republic (2017) and The Central Bank of the Russian Federation (2017).

Disparities between the de facto and the de jure Eurasian Economic Union

The actual manifestation of the Union may differ from the supposed reality described by the EEU's representatives and its other proponents. Significant criticism has been directed towards the actual EEU. Åslund (2013, n. p.) calls the Customs Union a 'protectionist collection of semi-developed countries [that] keeps all these economies back' and 'a disaster for all involved'.

While concluding that the countries of the EEU can receive a net benefit from joining the Union, Tarr (2016) also criticises the EEU. Both Tarr and Åslund (2013) raise the issue of the trade distortive effect of the EEU's application of Russian tariff schedules. Just as the previously attempted Eurasian Economic Community, a common tariff based on Russian rates will have a detrimental effect on the previously relatively open economies that now have become members of the EEU. Kazakhstan for one has gone from importing European and Chinese products to buying more expensive Russian goods of lesser quality

(Åslund 2013, Tarr 2016). Tarr mentions that the lowering of Russia's tariffs that is expected to follow on the country's accession to the World Trade Organization will mitigate some of these distortive trade losses affecting EEU member states. But, the author also underscores that even the lower future tariffs will be higher than those previously in use by some EEU member states. Åslund (2013) claims that these costs to economic welfare leaves no country voluntarily interested in joining the Customs Union, which supposedly forces Russia to subsidise their entries. In line with Åslund's opinion, Popescu (2014) suggests that gains to economic welfare are not the reasons explaining why countries enter the EEU. For instance, Armenia's entry may rather be motivated by the country's need of Russian military support and security guarantees (Popescu 2014).

Tarr (2016) also lists the many non-tariff barriers to trade that remain prevalent within the EEU. One such issue is the member states' de facto failure to apply a common trade policy towards third country. This breach of the ideas of the single market is manifested in Belarus' and Kazakhstan's refusal to adopt the Russia imposed counter sanctions against the European Union (EU) that followed Russia's illegal annexation of Crimea. Since then, a trade war has erupted within the EEU between Belarus and Russia. Russia has for instance banned Belarusian goods suspected of being of EU origin, while Belarus has reinstated custom posts towards Russia (Tarr 2016). In parallel to these disputes between Belarus and Russia, protectionist policies have been adopted by Kazakhstan in its alleged attempt to protect the Kazakh market. This is done by stopping imports of fuel and gas from Russia. Lastly, Tarr (2016) calls the EEU's slow progress in harmonising product standards a significant non-tariff barrier to trade. Technical requirements being processed at the multi-national level have caused delays. In this regard, Tarr finds that the formation of the EEU so far has been of little or no help.

3 LITERATURE REVIEW

Below, a background to OCA theory. The OCA criteria dealt with below are those that are of particular interest to this paper.

The origin of optimal currency area theory

The original idea of optimal² currency areas (OCAs) is traditionally attributed to the paper 'A Theory of Optimum Currency Areas' by Robert A. Mundell (1961). In his input to the

² The terms 'optimum' and 'optimal' are used synonymously.

then on-going discussion on fixed versus flexible exchange rates, Mundell suggests that a country may increase its welfare by surrendering its independent monetary policy through the fixation of exchange rates. Mundell describes the OCA as an area (that may consist of one or several countries or regions) that is maximising its economic benefit by abiding by the same monetary policy. This generally occurs when the participating regional entities (often nations) are similar enough to follow the same economic trends and development. Not being limited to what is proposed in Mundell's initial contribution to OCA theory, the potential benefits believed to be associated with entering a common currency union include the elimination of costs arising from currency conversion, lowered costs of transactions, higher interregional integration in the markets of goods and capital, synchronised shocks within the currency area, and the possibility to stabilise more volatile economies by anchoring them to a more stable economic union. Meanwhile, the drawback of entering into a currency area is believed to be the individual country's loss of sovereignty over its monetary policy and the subsequent inability to allow for flexible exchange rates to adjust for, and mitigate, economic shocks to a country's economy (Kunroo 2015).

The state of the art in the theory of optimal currency areas (OCAs) involves different approaches to what constitutes an optimal area for a common monetary policy. What has been developed from the influential paper by Robert A. Mundell is not a single theory of OCA. Rather, additions to the theory are adding and putting emphasis on different variables in determining a currency area's optimality. In the years following Mundell's 1961 publication, economists McKinnon (1963) and Kenen (1969) published papers that provided input to the OCA field. The ideas of Mundell (1961), McKinnon (1963) and Kenen (1969) are seen as the traditional approaches to OCA theory and they share an emphasis on OCA criteria based on economic ex-ante characteristics of countries. Later, in the 1970s and 1980s, the traditionalists' theories on OCA were criticised and further developed. OCA theory later resurged in the 1990s as the modern approaches to OCA were developed in papers written by authors such as Cohen (1993) and Frankel and Rose (1997).

The theoretical foundation: traditionalist approaches to OCA theory

Mundell

In his 1961 paper, Mundell discusses optimal currency areas by presenting scenarios where asymmetric shocks affect entities in currency areas with separate (pegged) and shared currencies.

First, Mundell considers the case of a currency area consisting of two countries with separate currencies that is struck by an asymmetric demand shock; demand shifts from country B to country A. In the case of a flexible exchange rate, a demand shock will be mitigated by changes to the countries' terms of trade. But, in a case of a currency area of fixed exchange rates, Mundell concludes that a surplus country's devotion to the peg makes any such adjustments impossible, leaving the full effect of the shock to impact the employment and output levels of country B. Second, Mundell discusses the case of an asymmetric shock affecting one region within an area sharing a common currency. In such a scenario, a demand shock forces the common monetary authority to use its policy instruments to either allow for an aggravated inflation in A or a rise in unemployment in B. In the latter scenario as well as the first, Mundell implies that in the two kinds of currency areas, exaggerated inflation and rising unemployment originating from asymmetric shock cannot be prevented simultaneously by a shared currency regime.

Mundell continues with a third scenario, where he considers a situation in which the world only consists of two countries with two separate national currencies, the USA and Canada. The countries are divided into two industrial regions stretching across both nations: a western region producing lumber and an eastern region producing cars. When an asymmetric shock causes a shift in demand in favour of lumber, inflation rises in the West while unemployment in the East increases. The USA and Canada are equally affected by the shock and the monetary authorities of both countries can only apply measures that will either incur aggravated levels of inflation or raise levels of unemployment in the different regions of each respective country. Mundell finds that such a scenario proves how a flexible exchange-rate regime does not always provide a solution to asymmetric shocks. In this case, the problem of inapplicable monetary policy tools arises from economic discrepancies between regions, not between countries. Consequently, the imbalance in the balance of payments cannot be retained through adjustments to the exchange rate between two national currencies.

Suppose instead that the two currencies are no longer based on national borders, but on regional belonging. If the US and Canadian dollars are abolished and replaced by a western and an eastern dollar, Mundell argues that the case for flexible exchange rates can be saved. Then, a fixed exchange rate between the currencies of East and West cannot be used to mitigate asymmetric shocks, because a fixed exchange-rate regime will incur the same costs (in terms of unemployment and output decline) as in the first scenario discussed above. However, if the exchange rate is flexible, one regional currency can depreciate (appreciate) against the other, and thus protect the balance of payment equilibrium. Mundell (1961, p. 660) thereby concludes:

Today, if the case for flexible exchange rates is a strong one, it is, in logic, a case for flexible exchange rates based on *regional* currencies, not on national currencies. The optimum currency area is the region.

As currencies often remain an issue of national sovereignty, currencies will, unlike Mundell's tweaked third scenario above, often remain constricted by national – rather than regional – boundaries. In order for multiregional areas facing the risk of asymmetric shocks to be suitable to hold a common monetary policy, other tools for adjustment are needed. Mundell, McKinnon and Kenen present the following variables as key to determine optimality of a currency area.

Factor mobility

Mundell claims, that if there is a high level of mobility between two regions, any asymmetric shock causing a shift in demand from one region to the other can be countered by workers moving from the deficit region to the surplus region. This way, inflation and unemployment is battled simultaneously, leaving no need for anything else than a common monetary policy (Mundell 1961, Kunroo 2015).

Flexibility in wages and prices

Mundell also provides the notion that with flexible prices and wages, an asymmetric shock will cause excess demand and a price surge in the surplus region and the opposite effect in the deficit region. Subsequently, market actors will buy less of the expensive goods and more of the inexpensive goods, which restores the equilibrium between the two regions within the currency area (Mundell 1961, Kunroo 2015).

Industry diversification

Kenen claims that a country with a diversified export sector is more likely to experience asymmetric economic shocks that cancel each other out. A country with a diversified export sector is more likely to suffer both booms and declines simultaneously. Therefore, there is less need of adjustments through a flexible exchange rate (Kenen 1969).

Similarity in production structures

Kenen (1969) also proposes that countries with a high level of similarity in production structures are less prone to be affected by asymmetric shocks. According to Kenen, this holds true because any shock to a specific sector is likely to be symmetrically distributed throughout the currency area.

More recent approaches

Co-variation in economic activities

Much like similarities in industrial structures, a high co-variation in economic activities makes countries share the same economic shocks, which in turn makes them suitable for a fixed exchange-rate regime (Jonung and Sjöholm 1999). The intuition behind this can be derived from Mundell (1961): the more similar the region, the more optimal the currency area.

Similarities to inflation

Jonung and Sjöholm (1999) propose that similar patterns to rates of inflation reduce the cost of convergence and adjustment when entering a currency union. By exhibiting a co-movement of inflation rates, countries can seem more likely to successfully integrate monetarily.

Political factors determining optimality

Similarities in inflation rates do not only entail lowered costs of adjustments. They also provide an indication of countries' economic structures and monetary and macro economical preferences. According to Jonung and Sjöholm, countries sharing preferences in matters of political economy (such as inflation and unemployment) are desirable to a functioning currency union (1999). A similar stand is taken by Broz (2005) who claims that two countries, one with high inflation and one with low inflation, can enter common currency area as long as they share inflation rate preferences and aim towards a shared

inflation goal. Matching fiscal and monetary policy conduct is thus of interest when assessing currency area optimality.

In addition to the policies pursued by governments, Jonung and Sjöholm (1999) and Mkenda (2001) argue that both public and political support are required to obtain the commitment necessary for a union to hold together. Political support is key. First, because a monetary union usually involves cross-border policies that can be fragile to political change. Second, it legitimises the choice of outsourcing one's monetary power to an overarching union (Mkenda 2001).

Empirical literature

The empirical literature on OCA theory mainly focuses on evaluating countries' and regions' optimality by looking at i) ex-ante economic characteristics of each respective economy and the potential union as a whole, ii) the historical symmetry of shocks affecting the economies and iii) studies of historical monetary unions.

The method of ex-ante evaluation used in the empirical literature can be exemplified with the paper on Sweden and Finland by Jonung and Sjöholm (1999). The authors study the two countries through the OCA theory framework with the purpose of evaluating Sweden's and Finland's suitability to join the EMU as well as assessing a potential Swedish-Finnish monetary union. The method compares chosen economic characteristics of Sweden and Finland and benchmarks them against potential EMU members and other non-aligned countries.

Mkenda (2001) uses many of the same variables as Jonung and Sjöholm when she evaluates whether Kenya, Uganda and Tanzania constitute an OCA. However, Mkenda also adds the General Purchasing Power Parity (G-PPP) method developed by Enders and Hurn (1994) to measure the symmetry of shocks striking the economies. Sideris (2009) also employs the G-PPP method to examine whether six Central and Eastern European countries constitute an OCA with the European Union. Beyond the G-PPP method and the traditional criteria, an approach used in the empirical OCA literature is to examine similarity of shocks by applying vector autoregressive models (Bergman 1999).

Historical experiences have also been considered in the development of OCA theory. Cohen (1993) concludes that political factors have been a key factor for the long-term survival of common currency areas, and that the traditional ex-ante variables of evaluating a monetary union therefore miss the point. Cohen argues that a successful monetary union either i) has a hegemon, like Belgium in the Belgium–Luxembourg Economic Union or ii) consists of closely tied countries sharing a high level of trust, as observed in the Scandinavian Monetary Union.

4 RESEARCH DESIGN

This paper aims at examining the economic feasibility of sharing a currency within the Eurasian Economic Union by answering the research question:

Do the economic conditions of the EEU's member states support the idea of them receiving economic benefit from a shared currency?

Scope

Although currency area optimality is defined as the maximisation of welfare, this paper does not have the ambition to quantitatively measure whether a Eurasian currency area would be the *most* beneficial solution to all involved parties. Instead, the analysis focuses on determining whether the possible costs of surrendering monetary policy sovereignty are likely to be outweighed by the potential benefits of a shared currency. The costs and benefits considered will be the economic effects of a shared currency. While there may be fiscal pecuniary benefits to be reaped from – e.g. – military support or energy subsidies, such benefits will not be considered in this paper. The reason is that gains made from military aid or energy subsidies in exchange for monetary policy integration originate from political negotiations rather than economic improvements that result from partaking in a currency area.

Analytical framework

If the EEU countries are to benefit economically from surrendering their monetary policy independence, any asymmetric shock affecting the currency area will have to be mitigated. This entails that the EEU's resistance to asymmetric shock has to be evaluated.

There are a number of ways of evaluating a currency area's optimality (i.e. its resistance to asymmetric shock), but there is no common agreement among scholars on whether any particular set of OCA criteria are more suitable than others. Tavlas (2008, p. 13) writes:

Empirical researchers dealing with common-currency area formation face the problem that there is no single, overriding criterion that can be used to judge the desirability and/or viability of a monetary union.

Given the ease of use of Jonung and Sjöholm's method, data availability and the model's applicability to the case of the EEU, this paper will be looking at the indicators employed by Jonung and Sjöholm (1999). Furthermore, Jonung and Sjöholm's emphasis on OCA ex-ante criteria have been found to have support in empirical literature (Mongelli 2002).

Table 4.1

Optimality criteria and data sources	
Country specific criteria	
Flexibility in wages and prices	Unemployment rates by country and year and gross average monthly wages by country and year in national currencies at current prices from UNECE Statistical Division Database. Data on average yearly inflation rates by country and year gathered from the World Economic Outlook (IMF 2016)
Degree of product diversification*	Data on EEU countries' sectoral value added from United Nations Statistic Division: National Accounts Official Country data: Value Added by Sector. Data on OECD countries from OECD Structural Analysis Database (2016)
Union specific criteria	
Similarity in industrial structure*	Data on EEU countries' sectoral value added from United Nations Statistic Division: National Accounts Official Country data: Value Added by Sector. Data on OECD countries from OECD Structural Analysis Database (2016)
Mobility of factors of production	Data on countries' total assets and total liabilities over GDP from the updated and extended version of dataset constructed by Lane and Milesi-Ferretti (2007). Foreign populations by citizenship from official estimates compiled by the International Labour Organization (2017) (data on Kyrgyzstan), national censuses (data on ARM 2011, BLR 2009, KAZ 2009 and RUS 2010). Migration flows to and from Russia from the International Migration Outlook (OECD 2016)
Co-variation in economic activity	Data on GDP growth by country and year gathered from the World Economic Outlook (IMF 2016)
Similarity in rates of inflation	Inflation rates by country and year gathered from the World Economic Outlook (IMF 2016)
Similarity in fiscal and monetary policy preferences	General government net lending/borrowing and gross debt data gathered from the World Economic Outlook (IMF 2016). Data on central bank policy rates from the International Financial Statistics database (IMF 2017)
Political factors	Qualitative analysis of public opinion based on data from the European Union Institute for Security Studies (2014), the Levada-Center (2016) and the Eurasian Development Bank (2016)

*Due to UNSD data on EEU countries' value added per sector not being available for all countries and all years using the same industrial classification, we had to construct our own classification system to overcome the differences between sources ISIC Rev. 3 and ISIC Rev. 4. The method is further explained in appendix 1

The variables included in the analysis consider the ex-ante feasibility of a particular group of countries creating a common currency. This entails that the analysis provides a theoretical indication of how likely a Eurasian currency union is to succeed (i.e. to withstand asymmetric shock). This paper's evaluation of a potential Eurasian monetary union should therefore be seen as a first step in studying the EEU's conditions for deeper

economic integration and not as the single method for determining the currency area's economic feasibility.

In their paper, Jonung and Sjöholm divide the criteria for assessing currency area optimality into two groups: criteria that refer to the characteristics of an individual country and criteria that apply to the currency union itself. Output results are compared both within the EEU and to third part countries unaffiliated with the Union. In this paper, the external benchmark states are eighteen members of the OECD (henceforth, referred to as the 'OECD') who were chosen on the basis of data availability. A list of these countries is presented in appendix table 4.1. The variables discussed along with their data sources are listed in table 4.1. The variables are further explained in section five (analysis).

Data reliability

While interpreting the data discussed in this paper, it is necessary to question the trustworthiness of the primary sources. Data on indicators such as unemployment levels, inflation rates and production growth can be skewed in order to benefit the appearance of a particular government or government body. Thus, the use of official government statistics entails the risk of having a bias. Such problems associated with reliability are particularly prevalent in cases where the transparency and accountability of the governments discussed are questionable.³ These issues cannot always be resolved by relying on data from international organisations and supra-national bodies, because information compiled by the United Nations and other international organisations is in many cases dependent on data originally supplied by official national sources. Due to this reason, there may be discrepancies between the de jure and de facto economies accounted for in this paper. It is thus difficult to know whether this paper's assessment of the economic conditions of the countries in question truly reflects the facts on the ground.

5 DATA ANALYSIS

Each section of the following analysis contains a description of the method used when applying the analytical framework discussed above.

³ From a global perspective, the EEU republics rank low in Transparency International's Corruption Perceptions Index. In 2016, Armenia ranked 113th, Belarus 79th, Kyrgyzstan 136th and Kazakhstan and Russia both ranked 131st (Transparency International 2016).

Country specific criteria: flexibility in wages

A flexible wage and price setting may help mitigate any asymmetric disturbances that affect a currency area. In a union submitting to the same monetary policy, internal devaluation becomes a substitute tool to the holistic policy measures that otherwise would have been adopted by independent central banks. The EEU countries' ability to devalue internally through wages can be measured by looking to the correlation between changes to real wages and unemployment. Wages that are not significantly affected by changes to unemployment levels indicate that there is a low degree of wage flexibility in the economy. In an economy with a high degree of wage flexibility, an increasing level of unemployment will correspond to decreasing real wage levels.

The results of regressions between real wages and unemployment levels are found in table 5.2. Real wages (of a particular base year) are set as the dependent variable, while unemployment rates are considered independent. The independent variable coefficients tabulated in 7.2 show a statistically significant negative correlation between real wage levels and unemployment in Armenia, Belarus, Kazakhstan and Russia. Any increases to unemployment levels will, in these four countries, reduce real wages. The results of 7.2 suggest that the EEU member states (with the exception of Kyrgyzstan) have a fairly effective wage setting, which may be able to counteract any asymmetric shocks affecting a Eurasian common currency area (see graphed data in appendix 2.1 through 2.5).⁴

Table 5.1

Real wage dependence on unemployment levels					
	ARM	BLR	KAZ	KGZ	RUS
Coef.	-2671	-60667	-3267	23	-383
P-value	0.00	0.00	0.00	0.85	0.00
R2	0.83	0.67	0.90	0.00	0.73

Source: regression using data from UENECE Statistical Division Database and World Economic Outlook (IMF 2016)

While data suggests that internal devaluation through wage flexibility is a tool for asymmetric shock mitigation that is available to most EEU countries, Kyrgyzstan seems to lack this capability. The regression coefficient describing the relationship between Kyrgyz unemployment levels and real wages is positive and lacks statistical significance. An apparently malfunctioning Kyrgyz market for wages reduces the chances of a mutually economically beneficial Kyrgyz accession into a Eurasian currency union. Kyrgyzstan would face the risk of not being able to achieve internal balance in a situation in which the

⁴ These conclusions remain unaltered as the same regression is performed using nominal wages as dependent variable, see appendix 3.

country shares a monetary policy with other countries. The results thus speak against the formation of a currency area that is including all five countries.

Country specific criteria: degree of product diversification

The degree of product diversification is measured by using a Herfindahl index:

$$Product\ diversification_i = 100 * \sum_{j=1}^n s_j^2$$

The index value of product diversification is of country ‘i’; the portion of value added, ‘s’, comes from sector ‘j’. The index value ranges between 0 and 100; a high value correspond to a low degree of product diversification in an economy. A low number is thus favourable.

The EEU countries product diversification in 2010–2015 is displayed in table 5.3. Values range between 10.61 (Armenia in 2015) and 15.79 (Belarus in 2012). While most countries show stable or slightly downwards sloping trends, Belarus stands out as the most volatile and least diversified economy. These findings can be attributed to the Belarusian economy’s large manufacturing sector combined with a relatively large reliance on agriculture, compared to Kazakhstan and Russia (see appendix table 4.2). Looking at 2010–2015 averages, Armenia and Kazakhstan stand out as most diverse economies and thus the theoretically most suitable countries to enter into a currency area.

Table 5.3

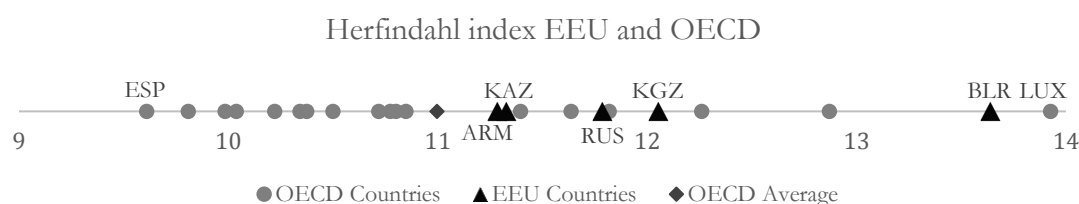
	Herfindahl index over time EEU						Average
	2010	2011	2012	2013	2014	2015	
ARM	11.81	11.69	11.90	10.86	10.85	10.61	11.29
BLR	13.34	13.56	15.79	14.04	12.90	12.24	13.64
KAZ	10.94	11.50	11.55	11.64	11.04	N/A	11.33
KGZ	12.53	12.24	11.64	12.01	11.94	11.97	12.06
RUS	11.70	11.77	11.80	11.88	N/A	N/A	11.79

Source: United Nations Statistic Division: National Accounts Official Country Data. Value added by industries at constant prices

In order to put the EEU’s product diversification into perspective, the EEU’s five year averages are plotted alongside the year 2015 values of eighteen OECD countries in graph 5.1.⁵ All EEU member states are found to be less diversified than the OECD average. Armenia and Kazakhstan lie close to what is the OECD average. Belarus’ lack of diversification is more extreme and lies close to that of Luxembourg, a small country dominated by its financial industry (see appendix table 4.3).

⁵ For underlying data, see appendix 4.1.

Graph 5.1



Source: United Nations Statistic Division and OECD Structural Analysis Database (2016)

Overall, the degree of product diversification vary within the EEU, but all countries are less diversified than the OECD average. The results speak against the EEU as an OCA viewed from a product diversification perspective, because the countries are vulnerable to suffer from asymmetric shocks. However, there are two major points of critique to this conclusion: i) four of the benchmark OECD countries, including Germany, have an above average index value even though they are part of the EMU (see appendix table 4.1) and ii) to measure a country's product diversification by using a Herfindahl index entails that the analysis merely is based on the sizes of an economy's components rather than on the similarities between countries' components. In order to develop the analysis, similarities in industrial structures are examined below.

Union specific criteria: similarity in industrial structure

The degree of similarity between the economies' production structures is measured by using a production similarity index:

$$Production\ similarity\ (country\ j) = 1 - \sum_{i=1}^n \left| \frac{VA_{i,Russia}}{\sum_{i=1}^n VA_{i,Russia}} - \frac{VA_{i,j}}{\sum_{i=1}^n VA_{i,j}} \right| * \frac{1}{2}$$

A comparison between base-country Russia and country 'j' is exemplified above. 'VA_i' represents value added of industry 'i'. The index ranges from 0 to 1 where 1 signifies that the countries' industrial structures are identical. A high number is thus favourable. The structural similarity of potential monetary union states are compared with the same OECD countries as in the section above on product diversification. A high similarity in industrial structure means that the currency area faces a lower risk of suffering from asymmetric shocks. This enables the use of an effective common monetary regime.

Table 5.4 shows production similarity index values of the EEU republics. The largest similarities between two countries are found when Russia is compared to Belarus and Kazakhstan. These three economies are largely composed of manufacturing and wholesale,

while having a smaller contribution to value added being made by agriculture than Armenia and Kyrgyzstan (see appendix table 4.2).

Table 5.4

Production similarity index EEU					
	ARM	BLR	KAZ	KGZ	RUS
Armenia	1				
Belarus	0.783	1			
Kazakhstan	0.702	0.724	1		
Kyrgyzstan	0.797	0.793	0.719	1	
Russia	0.711	0.801	0.822	0.766	1
All EEU country average:					0.762

Source: United Nations Statistic Division: National Accounts Official Country Data. Value added by industries at constant prices

In order to contrast the (dis)similarities in industrial structure within the EEU, table 5.5 summarises the production similarity index output for the EEU and eighteen OECD countries. Since a number of the OECD benchmark countries also are members of the currency union of the European Union – the EMU – the similarities in production structures between these EMU member states are included (for more data, see appendix table 5.1).

Table 5.5

Average production similarity		
EEU countries	OECD countries	EMU countries in OECD
0.76	0.84	0.85

Source: OECD Structural Analysis Database (2016) and United Nations Statistic Division

Assuming that a crucial criterion when forming a currency union is to have a high degree of industrial similarity and that the EMU is a well-functioning monetary union, a Eurasian currency area would require a degree of industrial similarity that is similar to that of the EMU states of the OECD (presented in table 5.5). Table 5.4 and table 5.5 show that the EEU fails to achieve this. The average similarity in industrial structure of the EEU falls well below the values of the OECD and the EMU states of the OECD. If one relaxes the assumption that the EMU is a well-functioning currency union (see for instance Krugman 2013) and additionally supposes that the EMU suffers from problems associated with industrial differences between EMU member states, the EEU is even further away from reaching a degree of industrial similarity necessary to profit from a beneficial monetary union.

Table 5.6

Average production similarity with Russia		
EEU countries	OECD countries	EMU countries in OECD
0.77	0.75	0.74

Source: OECD Structural Analysis Database (2016) and United Nations Statistic Division

Table 5.6 shows the average production similarity between Russia and other countries. The index output shows that the Russian economy's level of resemblance to the EEU states just about surpasses the country's similarity to the OECD. The EEU does not stand out as the evident candidate area to hold a joint currency.

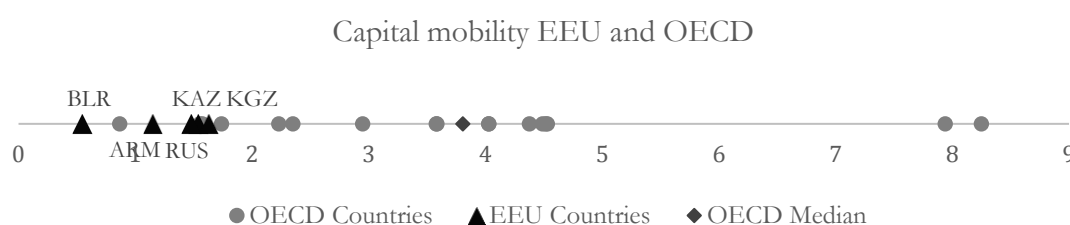
Union specific criteria: factor mobility

In their paper, Jonung and Sjöholm refer to the European Union's history of facilitating for capital mobility as they conclude that this criterion favours the EMU. In the case of the much younger Eurasian Economic Union, similar conclusions are more difficult to draw from historical experiences. By aggregating each economy's total assets and total liabilities and divide the sum by country GDP, the relationship between each country's investments abroad and foreign investments at home and the country's GDP is obtained.

$$\text{Capital mobility proxy} = \frac{\text{total assets} + \text{total liabilities}}{\text{GDP}}$$

The results can be seen as a proxy measurement for each economy's facilitation of capital mobility. A high value indicates high level of capital freedom of movement. Capital mobility of EEU countries is displayed in graph 5.2.

Graph 5.2



Data on years 2000–2011. Source: the updated and extended dataset constructed by Lane and Milesi-Ferretti (2007)

It is necessary to acknowledge that OCA theory requires mobility of capital within the currency area, rather than an overall capital mobility. However, data availability constraints make more precise conclusions on the degree of mobility between EEU countries difficult to draw. What is seen in graph 5.2 is a degree of capital mobility of EEU countries that is far below the median of the OECD. Based on the data, it is reasonable to assume that the overall lack of capital mobility of the EEU countries also is prevalent in the intra-regional exchange of capital of the EEU. Provided that capital mobility is far from perfect within the EEU, a potential currency area will not be able to mitigate potential asymmetric shocks through the mobility of capital. A common monetary arrangement would therefore not seem optimal from a capital mobility perspective.

The mobility of labour would seem like a more complex issue due to cultural and linguistic barriers between economies. The problem posed by such cultural divides has for instance been evident in the EU's attempts to realise a single market (Jonung and Sjöholm 1999). In this paper, the degree of labour mobility is assessed by comparing the sizes of groups of foreign citizens living in each respective EEU state and by looking at migration flows.

Table 5.7 shows the official populations by citizenship of each country. Data show that Russian citizens belong to the major minority groups in the four other EEU republics (see appendix tables 6.1 through 6.5). In Armenia, Belarus and Kazakhstan – Russians constitute the most numerous group of foreign citizens. In parallel, bearing in mind the relatively small size of both countries, Armenian and Kyrgyz nationals are two significant foreign groups in the Russian Federation.

Table 5.7

		Population by citizenship				
		Citizenship				
		Armenian	Belarusian	Kazakh	Kyrgyz	Russian
Country	ARM	-	N/A	N/A	N/A	13,351
	BLR	1,622	-	1,811	135	83,561
	KAZ	993	559	-	9,143	38,609
	KGZ	0 or N/A	0 or N/A	5,000	-	1,000
	RUS	59,800	N/A	8,300	117,700	-

Populations: ARM of 2011, BLR of 2009, KAZ of 2009, RUS of 2010, KGZ 2014 official estimates. Sources: national censuses and official estimates⁶

Russia's emphasised role in the EEU labour market is further exacerbated by data on the migration flows in table 5.8. The table shows a net influx to Russia from Armenia and Kazakhstan. There are also significant populations of Armenians and Kazakhs holding residency permits in Russia.

Table 5.8

Major migration flows to and from Russia ¹ 2015				
	Immigration	Emigration	Issued work permits ²	Residence permits holders
Ukraine	169000	48000	216000	306000
Uzbekistan	74000	95000	64000	138000
Kazakhstan³	66000	30000	53000	86000
Tajikistan	47000	36000	43000	100000
Armenia	46000	25000	8000	116000

¹Excluding movements to and from the illegally annexed Crimean peninsula, ²temporary and permanent, ³EEU member states in bold. Source: International Migration Outlook (OECD 2016)

⁶ National Statistical Service of the Republic of Armenia (2013), National Statistical Committee of the Republic of Belarus (2009), The agency on Statistics of the Republic of Kazakhstan (2011), Federal State Statistics Service (2016), International Labour Organization (2017).

Considering the size of each country relative to Russia and the historical and current political and economic regional hegemony of Russia, a migration flow bias towards Russia is no surprise. Strong cultural, historical and linguistic⁷ ties between each state and Russia can be a factor that facilitates mobility within the EEU to and from Russia.

Still, based on the data presented, the intra-state exchange of migrants not involving Russia does not appear to be particularly prevalent. Officially, only minor or negligible groups of Armenian, Belarusian, Kazakh and Kyrgyz citizens reside abroad in another EEU state than the Russian Federation.⁸ This historical lack of mobility between non-Russian EEU states can be explained by two factors: i) an absence of an adequate legal framework, which may have constituted a barrier to labour mobility between the five republics and ii) cultural divides. As stated before, cultural differences have previously been used to explain the failure to realise a fully mobile labour market within the European Union (OECD 2014). However, when taking the historical background of section two into account, the cultural ties between the EEU states seem greater than those between, e.g., the EMU states. Cultural similarities would thus seem to aid labour mobility, rather than hamper it. Yet, a presence of a relatively low cultural thresholds is not reflected in the available data. Perhaps this is due to the firstly mentioned potentially obstructing factor, the historical absence of a regulated single market for labour.

A lack of definitive population data and the ambiguity of available data makes a conclusive assessment of labour flexibility difficult to reach. In addition to a high degree of uncertainty in the quality of national censuses and other official statistics, there are high numbers of unrecorded migrants, particularly in Russia (Anichkova 2012). Estimates place more than 3.7 million illegal migrants in the Russian Federation alone (Malyuchenko 2015). These unrecorded residents are hidden from the analysis above and thus cause an underestimation of the de facto labour mobility within the EEU. Furthermore, the data's underlying population censuses were conducted prior to the conception of the single labour market of the EEU. Additionally, many previously illegal (unrecorded) migrants

⁷ In addition to the Russian federation, Russian is an official language of Belarus, Kazakhstan and Kyrgyzstan (Central Intelligence Agency 2017).

⁸ It is necessary to acknowledge that large ethnic groups from each respective state live all across the former Soviet Union. As these populations often crossed borders before the USSR's collapse, they are not regarded as migrants in this analysis. What is of interest to the analysis is the occurrence of mobility across the independent states' borders.

have become legalised since the Union's inception. Consequently, newer population censuses will most probably depict real labour mobility more accurately.

In sum, by looking at data and the ex-ante conditions of these countries forming a monetary union, conclusions on labour mobility are difficult to draw. The freedom of movement of labour within the EEU is difficult to assess due to ambiguous and deficient population data. While the populations of EEU citizens belong to the largest minority group of each state, little is known about migration trajectories, illegal migrants, the effect of the EEU regulation on labour mobility, etc. But considering the countries' now legally ratified labour mobility⁹ as well as the cultural and linguistic similarities between the EEU states, there is reason to believe that the EEU will be more successful than the EU in integrating labour markets. Therefore, while there are reasons to remain doubtful about the EEU's ability to de facto achieve labour mobility,¹⁰ there is a chance that the work force can act to balance any asymmetric shocks that may strike a future currency area. A decisive assessment of the ex-ante conditions are, however, not possible to make.

Union specific criteria: co-variation in economic activity

The relationship between economies' economic cycles is measured using the correlation between rates of GDP growth. A high correlation of economic activities indicates that the countries face a smaller risk of experiencing asymmetric shocks, because they move together.

Table 5.9

	EEU correlation to GDP growth									
	1993–2015					2005–2015				
	ARM	BLR	KAZ	KGZ	RUS	ARM	BLR	KAZ	KGZ	RUS
Armenia	1.00					1.00				
Belarus	0.44	1.00				0.61	1.00			
Kazakhstan	0.53	0.77	1.00			0.75	0.74	1.00		
Kyrgyzstan	0.28	0.72	0.70	1.00		0.04	0.00	-0.05	1.00	
Russia	0.63	0.75	0.88	0.63	1.00	0.90	0.84	0.85	0.05	1.00

Source: World Economic Outlook (IMF 2016)

Table 5.9 shows that the correlations between the EEU countries' GDP growth have been higher and varied less 2005–2015 than 1993–2015. The exception is Kyrgyzstan, a country which in the last decade has shown little to no correlation with the other EEU states. The

⁹ The regulation on labour mobility within the EEU has been described as satisfactory (Vinokurov 2017).

¹⁰ One such reason to remain doubtful would be the on-going intra-regional trade wars.

other EEU countries show their highest correlations to Russia 2005–2015. The high correlation between Russia–Belarus and Russia–Kazakhstan can be explained by the countries’ relatively high degree of industrial similarity (see table 5.4). The high correlations to Russian GDP growth reflects Russia’s role as hegemon and driver of the regional economy.

In order to put GDP growth correlations between EEU states and Russia in perspective, a comparison between Russia and the OECD is made. The average OECD correlation to Russia is found in table 5.10 (see underlying data in appendix table 7.1). In 1993–2015, the average correlation to Russia is higher within the EEU than between Russia and the OECD. This implies some relative degree of co-variation in economic activities between each EEU state and Russia. In the ten year period starting in 2005, the correlations between the EEU and Russia and the OECD and Russia are more alike. However, when excluding Kyrgyzstan, EEU GDP growth correlation to Russia is high.

Table 5.10

EEU and OECD correlation to Russian GDP growth		
	1993–2015	2005–2015
EEU average	0.72	0.66
EEU average adj. for KGZ	0.75	0.86
OECD average	0.27	0.69

Source: World Economic Outlook (IMF 2016)

In conclusion, the data suggests that the EEU as a whole does not exhibit a marked co-variation in economic activity. However, when excluding outlying Kyrgyzstan, data indicate that a limited group of the countries faces a lower risk of experiencing asymmetric shocks (due to their comparatively high degree of correlation to GDP growth). This speaks in favour of common monetary policy arrangement between a different constellation of countries, but not in favour of a currency area covering the EEU as a whole. The entirety of the EEU does not exhibit the proper characteristics to hold a common currency.

Union specific criteria: similarity in rates of inflation

In order to assess whether a monetary union between the EEU countries is suitable, the rates of inflation of each state are compared.¹¹ Jonung and Sjöholm (1999) conclude that a transition into a currency union will be smoothened by historical similarities between each economy’s inflation rates. Such similarities should optimally exist between all

¹¹ In the analysis of Jonung and Sjöholm, the inflation rates of Sweden and Finland are compared to those of the supposed anchor economy of the European Monetary Union (EMU). In this paper, Russia acts as the Eurasian counterpart of Germany.

potential currency area members. In table 5.11, inflation rates covering three recent years are supplied along with a fifteen year average.

Table 5.11

	Inflation rates of EEU states				
	ARM	BLR	KAZ	KGZ	RUS
2013	5.79	18.30	5.83	6.61	6.76
2014	2.98	18.11	6.72	7.53	7.82
2015	3.73	13.52	6.45	6.50	15.53
Average 2000–2015	4.12	33.90	8.24	8.38	11.89

Inflation data on 1993–2015 and future estimates in appendix table 8.1. Source: World Economic Outlook (IMF 2016)

While the fifteen year averages of Kazakhstan and Kyrgyzstan are relatively similar, there are vast differences in inflation rates between most EEU states. Even though there are similarities in industrial structures between Russia–Belarus and Russia–Kazakhstan, inflation rates still differ significantly between these countries both in the historical short and mid-term.

As it is not clear what sort of monetary policy will be governing a potential EEU currency area, one can suppose that the Russian economy will act as an anchor country with greater influence over policy measures taken. The cost of convergence would thus be smaller for Russia. If Russia is seen as the regional anchor, it is fair to compare inflation rates of Armenia, Belarus, Kazakhstan and Kyrgyzstan with those of Russia. Historical correlations between inflation rates can be seen in table 5.12. As seen in the table, correlations are generally low, and in the case of Armenia, inflation rates have moved in the opposite direction to those of Russia. Since the year 2000, the development of the EEU countries' rates of inflation has had little in common with the Russian price changes.

Table 5.12

	Correlation between EEU member states with RUS as base			
	ARM	BLR	KAZ	KGZ
Correlation 2000–2015	-0.41	0.53	0.38	0.22

Correlation made from inflation data in appendix table 8.1. Source: World Economic Outlook (IMF 2016)

Kunroo (2015) discusses how the formation of a currency area can have a stabilising effect on countries with a history of volatile rates of inflation. A country (like Belarus) can end up on a more stable price trajectory if it anchors its currency to a more stable economy (through a peg or through the creation of a common currency). In turn, more stable price levels potentially lead to economic stability and greater welfare in the pegged country. When looking at the EEU, the question is whether the Russian hegemon economy constitutes such a potentially benefitting, stable anchor to the remaining members of the EEU. Data displayed in table 5.11 show that Russia has experienced an average double

digit inflation rate since the year 2000. The volatility of the economy's price levels is further exemplified by the doubling of annual inflation rates that occurred between 2014 and 2015. While historical rates of inflation are lower in Russia than in Belarus, the remaining three republics display considerably lower inflation rate levels. Russia would therefore not seem like the most suitable candidate to anchor price levels to. A currency union involving the Russian Federation may damage the relative stability of other EEU states.

In sum, data indicate that significant differences to inflation rates will make it difficult to achieve convergence prior to the formation of a currency area. The findings further suggest that any common monetary arrangement would come at great costs of adjustment to many of the EEU states. Russia's lack of price level stability may also threaten the stability of currency union member states, were they to anchor their economies to Russia. This speaks against the proposed currency area being economically feasible to all five countries.

Union specific criteria: similarity in fiscal and monetary policy preferences

When examining similarities to the political economy, monetary policy preferences and fiscal policy preferences are considered. When comparing monetary policies of countries, one indicator is the similarity between rates of inflation (as seen above). Another factor is the central bank policy rates of the proposed monetary union's member states.

As seen above, the countries' historical rates of inflation exhibit remarkable differences. Broz (2005) claims, however, that inflation rate *preferences* are of superior importance when assessing a currency area's feasibility. Historical inflation rates are to an extent manifestations of policy preferences – but then of preferences that have dominated in the past. A better indicator of what will govern future policy measures is inflation rate targeting. By sharing such common goals, historical differences in inflation rates between economies may be overcome, according to Broz.

By looking at the current inflation rate targets displayed in table 5.13, it is clear that differences to monetary policy preferences also remain prevalent within the EEU. In addition to the individual inflation targets displayed in table 5.13, the EEU requires its members to achieve yearly inflation rates that do not exceed the Union's members' lowest inflation rate by more than five percentage points. This has only been achieved once since 1993 (see appendix table 8.1 for data on historical annual inflation rates).

Table 5.13

EEU inflation rate targets					
	ARM	BLR*	KAZ*	KGZ**	RUS
Inflation rate target	4%	5%	3-4 %	5-7 %	4%

*Medium term (2020), **Medium term (year not specified). Source: national central banks, see table 2.2

The EEU countries monetary policy preferences are also reflected in each respective country's central bank policy rates in table 5.14. Congruent with the findings above, the nominal interest rates suggest that Belarus and Kazakhstan have pursued more restrictive monetary policies, while Armenia and Kyrgyzstan have been more expansionary.

Table 5.14

Central bank policy rate by country					
	ARM	BLR	KAZ	KGZ	RUS
2014	7.44	21.25	5.50	7.38	9.88
2015	10.00	25.00	9.75	10.13	11.88
2016	7.19	20.75	14.25	6.25	10.38
Average	8.21	22.33	9.83	7.92	10.71

Source: IMF International Financial Statistics (2017)

In sum, looking at present day economic ex-ante conditions, the discrepancies in monetary policy preferences make an optimal currency union (with a common monetary policy regime) difficult to realise. Countries pulling in different directions may obstruct centralised decision making and any attempts to converge may come at a high cost.

When studying fiscal policy preferences, government net lending and gross debt levels are regarded. EEU's degree of fiscal convergence can be evaluated by considering each respective government's inclination to run expansionary or restrictive credit policies. Deficits are indicative of expansionary fiscal policy, while surpluses point towards more restrictive policy preferences.

Data in table 5.14 show that in recent years, all five states have run government deficits (see appendix tables 9.3 and 9.4). In the longer term, Kazakhstan and Russia have an average general government surplus while the other countries have average deficits. Also, there are clear difference to the levels of gross government debt within the Union. In 2015 – while government debt levels in the EEU remain comparatively low from a global perspective (World Bank 2017) – there is a significant intra-regional variance to debt levels (see table 5.15). The results indicate that the governments have different preferences regarding the financing of fiscal policies, something which may cause the area to grow at different speeds and lead to imbalances in a future currency union.

Table 5.14

General government net lending/borrowing					
	ARM	BLR	KAZ	KGZ	RUS
2013	-1.94	-1.75	1.74	1.87	-1.09
2014	-4.85	-3.49	-6.85	-1.17	-3.48
2015	-4.50	-5.33	-5.65	-4.51	n/a
Average 1994–2015	-3.05	-2.43	2.17	-5.64	0.79

Data on years 1994–2015 in appendix 9.3. Source: World Economic Outlook (IMF 2016)

Following the reasoning of Broz (2005), fiscal policy targets can be thought to reflect policy preferences. As stated in the second section of this paper, there are certain macro-economic prerequisites included in the EEU's founding documents. Fiscal policies are guided by an annual budget deficit target set at 3% of GDP and a public sector debt ceiling at 50% of GDP. While historical data are interesting to take into account, Broz means that the shared targets themselves are what is important to achieve convergence, rather than past conduct. However, if one does look at historical figures (while remembering that the EEU is still in its infancy) it is found that the EEU shows some promise in regard to matching these convergence criteria. Deficits have been too large during 2014 and 2015, but the longer term average is (with the exception of Kyrgyzstan) closer to target. In addition, government debt level averages (once again, with the exception of Kyrgyzstan) are well below the 50% threshold.

Table 5.15

General government gross debt (% of GDP)					
	ARM	BLR	KAZ	KGZ	RUS
2013	38.0	34.5	12.2	46.1	13.1
2014	41.4	37.3	14.1	52.3	15.9
2015	46.9	53.7	21.9	66.0	16.4
Average 1996–2015	33.9	26.4	11.6	73.8	24.0

Data on years 1994–2015 in appendix table 9.4. Source: World Economic Outlook (IMF 2016)

In summary, the findings in this evaluation of monetary and fiscal policy similarities do not provide support for instigating a Eurasian currency at present time. Starting with monetary policy it is concluded that as of today, it would provide difficult for these countries to converge and reach joint policy decisions. Then, by examining fiscal policies, significant dissimilarities between the countries' gross debt and deficit levels are found. A currency union containing countries that are running different fiscal policies may cause cyclical imbalances within the currency area and a subsequent inability of the mutual central bank to apply the adequate monetary policy measures. The results of such differences to fiscal and monetary policy preferences may thus be an unstable currency union that may hurt its member states.

Union specific criteria: political factors

The population's feelings towards a monetary union are important if the Union is to muster support and succeed (Jonung and Sjöholm 1999). Public affinity towards further integration is affected by cultural, social and historical connections between countries and peoples. Table 5.16 shows the proportions of the EEU states' populations that are definitely or rather positive to the EEU.

Table 5.16

Proportion of observed population definitely or rather positive to the EEU					
	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia
2015	56%	60%	80%	86%	78%
2016	46%	63%	74%	81%	69%

Source: Eurasian Development Bank (2016)

The public support for the EEU is high in all five countries, but it has seen a recent downturn in Armenia. Vinokurov (2017) claims that the loss of support in the Armenia might be due to the escalation of the Nagorno-Karabach conflict.

Popescu (2014, p. 13) discusses public sentiment towards the EEU in Russia. He states that 'the Eurasian [Economic] Union enjoys quite a wide base of political and societal support in Russia'. He points out that both conservative and liberal Russians have reason to support the EEU. On the one hand, Popescu writes, there are conservatives who consider the EEU a mean for Russia to resurge as a great power and to ensure the survival of the pro-Russian status quo in Minsk and Astana. On the other hand there are liberals considering the EEU an opportunity for a better business environment through increased competition with less corrupt and better organised countries such as Belarus and Kazakhstan. Furthermore, liberals hope the EEU will prove to be less bureaucratic and more rational than current Russian institutions (Popescu 2014).

The public support for the EEU in Kyrgyzstan has been high (see table 5.16). According to Popescu (2014), this is due to the fact that access to the Russian labour market enables many Kyrgyz workers to increase their living standards and achieve greater socio-economic stability. While increased mobility of labour constitutes an advantage in the smaller post-Soviet republics, migrants are often met with scepticism on the other side of the border. Popescu (2014, p. 17) points out that 'the tension between widespread anti-immigration sentiment among the Russian population and Russia's foreign policy of consolidating and expanding the Eurasian [Economic] Union is already evident'. The Levada-Center's data

is also indicative of tensions between Russians and non-Russians. The Center's 2016 report finds that 68% of Russians think that the government should try to restrict the influx of migrants. The findings indicate a widespread Russian xenophobia, the presence of which is further supported by the observed fact that many Russians even are sceptical of country-men from different regions. According to the Levada-Center, 54% of Russians favour limiting non-local Russians' access to the local market for housing and work (Levada-Center 2016). Regarding Belarus and Kazakhstan, these countries' economic integration with Russia has gone further. Most Russians do not even consider Belarus a separate country (Levada-Center 2016). Acceptance in Russia towards Belarusians and Kazakhs is subsequently generally higher than towards Central Asian nationals (Popescu 2014).

To conclude, opinion polls show that there is support for the in general EEU. Yet, any definitive answer to the question whether the population favours a common currency in particular cannot be given. Provided that a Russian public support is important for a Eurasian currency union to succeed, the fact that both liberal and conservative forces support the EEU is promising. But, anti-immigration sentiments can prove equally important and potentially detrimental to the formation of a currency area within the EEU. Xenophobia may for instance act as a barrier to efficient mobility of labour, which would hamper a potential currency union's ability to mitigate asymmetric shock.

6 CONCLUSION

With the aim of studying the economic feasibility of introducing a shared currency within the Eurasian Economic Union, the question was asked:

Do the economic conditions of the EEU's member states support the idea of them receiving economic benefit from a shared currency?

The main conclusions drawn from each studied criteria are summarised in table 6.1. In order to reach an answer to the research question, the studied criteria must be weighed against one another. To quantify benefits and costs of entering a union is, however, challenging. Therefore, the weighing is done in a qualitative sense (Krugman 2013). Determining optimality (or currency area suitability) boils down to looking at the area's chances of preventing asymmetric shocks from occurring at all. If this fails and shocks do occur, the currency area must allow for the right internal adjustments to take place.

Table 6.1

Conclusions drawn from studied criteria	
Country specific criteria	
Flexibility in wages and prices	Wage setting is somewhat effective in all EEU countries except for in Kyrgyzstan. Results imply that the Kyrgyz wage setting could not counteract an asymmetric shock affecting the EEU, which means that a currency area containing all five countries may not be reciprocally beneficial.
Degree of product diversification	The EEU nations show a varying degree of product diversification, with all countries showing a diversification below the OECD average. This points to the EEU being unsuitable as a currency area, because the countries' lack of product diversification makes them more likely to suffer from asymmetric shock.
Union specific criteria	
Similarity in industrial structure	While some EEU republics show relatively similar industrial structures, none of the countries show a high degree of similarity from an international perspective. The results suggest that the Union's vulnerability to asymmetric shock is above average. Subsequently, the EEU would not benefit from sharing a currency.
Mobility of factors of production	Data inconclusiveness makes decisive assessments of ex-ante labour mobility difficult to make. But, a de jure freedom of movement, along with cultural and linguistic similarities between countries, may help realise a single labour market. Moreover, the findings imply that capital mobility is low within the EEU, which suggests that a currency union would be unable to balance shocks. When looking at factor mobility as a whole, ex-ante conditions are not favouring a Eurasian currency.
Co-variation in economic activity	While some of the EEU countries experience similar cyclical variations to economic growth, not all member states are highly correlated. The results thus indicate that the EEU in its entirety is not suitable to enter a currency union.
Similarity in rates of inflation	Data shows vast differences in inflation among most EEU states. This suggests that a common currency area would come at large adjustment costs. Data speak against currency area formation.
Similarity in fiscal and monetary policy preferences	The EEU states seldom follow the same expansionary or restrictive monetary and fiscal policies. The findings suggest that the EEU of today is not ready to form a currency area.
Political factors	Public opinion supports the EEU in general, but no data on whether a shared currency in particular is demanded is found. Russian sentiments against immigration may, however, pose a threat to implementation of a single labour market, which is necessary to uphold a shared currency. Whether public opinion will hinder the sustainable implementation of a common currency is thus difficult to assess.

First, looking at the EEU's likeliness to suffer from shocks, the analysis finds that the EEU as a whole lacks the economic conditions to form a currency union. Low product diversification and minor similarity in industrial structures suggests that there is a risk of asymmetric shocks occurring. While the fact that a majority of the EEU states exhibit high correlation of GDP growth to the Russian economy favours a currency union, Kyrgyzstan's growth correlation with the potential Russian hegemon differs completely. As a whole, the EEU seems to be more likely to suffer from asymmetric shocks than the OECD countries of comparison. Because a mutual central bank is not be able to mitigate economic booms and recessions occurring within the area simultaneously, this elevated risk of suffering from asymmetric shocks entails high expected costs of forming a currency union. If the currency union is to be considered economically beneficial to all parties, these

expected costs will have to be outweighed by the possible benefits of a shared currency (such as trade facilitation and reductions to transaction costs), which seems unlikely.

Second, looking at the regions ability to handle shocks, the analysis shows that the EEU as a whole may have difficulties in balancing out asymmetric blows to the Union's common economy. Problems are caused by all EEU member states not having a flexible wage setting, an inefficient movement of capital, a labour mobility that is difficult to assess and Russian anti-immigration sentiments that may hamper attempts to integrate the economies' labour markets. The analysis thus suggests that there are several factors that speak against the EEU as a whole being able to balance shock. Balancing tools are necessary in a currency area that by definition contains regions (or countries) that are unable to use adjustments to exchange rates to smooth economic disturbances. If the currency area lacks these tools, the expected costs of sharing legal tender are high and difficult to compensate for through the reduction of transaction costs and facilitation of trade that potentially follow the formation of a currency union. It would be difficult for all EEU countries to increase welfare through a joint currency.

Third, when looking at adjustment costs it is found that an accession into the proposed currency area may be costly. Discrepancies in inflation rates and in policy preferences indicate that a currency union would entail high convergence costs for many of the EEU countries. An endeavour to further integrate the EEU states through a currency union is therefore required to generate enough economic gains to outweigh such convergence costs. A reciprocal economic benefit is thus difficult to obtain through a currency union.

In sum, the analysis finds that the Eurasian Economic Union is both vulnerable to suffer from, and unable to cope with, asymmetric shocks. Surrendering monetary policy independence will result in high expected costs that are unlikely to be outweighed by the potential economic benefits of forming a currency union. Hence, the economic conditions of the EEU states do not support the idea of them receiving mutual economic benefit from the formation of a currency area.

7 FURTHER DISCUSSION

The conclusion above is based on an assumption that the currency union will consist of all five members of the EEU. As shown in the analysis, there are however instances when

a smaller group of Eurasian states exhibit economic conditions that are more in line with the requirements of a currency union. For instance, all countries except Kyrgyzstan seem to have a flexible wage market. Potentially, a different constellation of countries has greater chances of successfully – and to their mutual benefit – sharing a currency. Whether there are other possible currency areas within the EEU (or including third part countries) is not covered in this paper and is a possible topic for further research.

Moreover, OCA theory is concerned with common currencies as a means of maximising economic benefit for the participating regions. The distribution of that benefit – and the consequences of that distribution – is, however, seldom addressed. Even if one or several countries could be worse off from sharing a currency, the theoretical net benefit of a currency union as a whole may be positive. In terms of economic efficiency, the currency area could be beneficial in the sense that it leads to an overall increase to welfare. But what about the country that is left worse off? There may be political incentives for that country to remain or enter in the union. In the case of the EEU, Armenia is believed to gain militarily from being more closely tied to Russia. If political ties to Russia are strengthened as Armenia deepens its economic integration with Russia, an economic loss of Armenia may be outweighed by political and strategic gains. A possible topic for further discussion is hence whether a currency area still can be considered to be beneficial if one participating country receives an economic net loss. Further research should study how nations react to the distribution of benefit within a currency union and the political reimbursement mechanisms at play when a country with poor prospects enters one. An economic examination of how each individual EEU country would benefit or lose from a common currency policy could shed light on the political factors and economic incentives behind a Eurasian common currency.

Furthermore, as this paper mainly investigates the ex-ante conditions of the EEU to form a monetary union, its conclusion is subject to the criticism of Frankel and Rose (1997, p. 2): ‘countries which join EMU, no matter what their motivation may be, may satisfy OCA properties ex-post even if they do not ex-ante’. Frankel and Rose argue that the formation of a currency union itself can cause the currency area to become optimal. Thanks to increased trade and a deepening of economic integration, a currency area may with time become of net economic benefit to all participating regions. However, an exhaustive analysis of the EEU’s ex-post situation would require assumptions and in-depth

knowledge of the development of the member states' economies that lie beyond the ambition of this paper. Further research may weigh in this OCA theory perspective on the EEU.

Lastly, the discrepancy between the conclusion of this paper and the conclusion of Cohen (1993) is worthy of mentioning. One of Cohen's conclusions is that common currency areas historically have been successful if they are dominated by a hegemon. This would suggest that the EEU, dominated by the Russian economy, is likely to be successful. Cohen disregards the importance of traditional analysis of OCA criteria and focuses on intra-relational factors when reaching his conclusion. Additionally, he defines currency area success as *longevity* rather than economic efficiency. This paper has focused on whether or not an EEU common currency is economically defensible, which given Cohen's results does not necessarily guarantee longevity. It is possible that an EEU common currency could be long lived even if the conclusion of this paper holds; economic inefficiency and longevity are not mutually exclusive. In order to properly predict not only the economic feasibility of a currency area but also its longevity, a deepened study of what is binding the countries together is necessary to conduct.

8 SUMMARY

In sum, this paper has examined the Eurasian Economic Union's chances of successfully introducing a common currency. Success is defined as a reciprocal economic benefit that may result from the use of a mutual legal tender. A smoothening of cross-border trade, lowered barriers to trade and a reduced exposure to exchange rate risk are named as possible gains that may come with a shared currency. Meanwhile, the drawback of a mutual monetary regime is the loss of monetary policy independence that is unavoidable when abiding by the same monetary policy regime. The analysis of the EEU's suitability as a currency area is conducted by using Optimal Currency Area theory. The theoretical framework evaluates the proposed union's chances of avoiding and/or mitigating asymmetric shock. The occurrence of asymmetric shock has a detrimental effect on the regions of the currency area as long as these lack the ability to mitigate them through the economies' adjustments. By employing a given set of variables, the paper evaluates the EEU's risk exposure. The paper studies: i) each country's degree of wage flexibility, ii) each country's level of production diversification, iii) production structure similarities between all countries, iv) the mobility of factors of production within the currency area, v) the

countries' co-variation in economic activity, vi) fiscal and monetary policy similarities between all countries and vii) other political factors affecting a common currency's chances of success.

The analysis finds that it is likely that a Eurasian currency area will suffer from asymmetric shock. The risk originates from the countries' lack of industrial diversification, the Union's lack of industrial similarity and a low degree of covariation in economic activity. The results also imply that the economic conditions of the EEU countries do not allow them to balance out any shocks, were they to happen. While there is flexibility in wages in most of the countries, one economy (Kyrgyzstan) lacks this tool for internal adjustment. The degree of factor mobility within the EEU is also not adequate to facilitate for idiosyncratic disturbances. Additionally, varying degrees of inflation will inflict large convergence costs to a monetary union and xenophobia in Russia may hamper the attempts to realise de facto labour mobility. The paper therefore concludes that a currency union between the current members of the EEU is not economically defensible, as it would not provide the participating countries with a reciprocal economic benefit. The conclusion implies that the EEU states should retain the ability to mitigate shock through the exchange rate.

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10 APPENDIX

Appendix 1 Industry classification

Appendix table 1.1

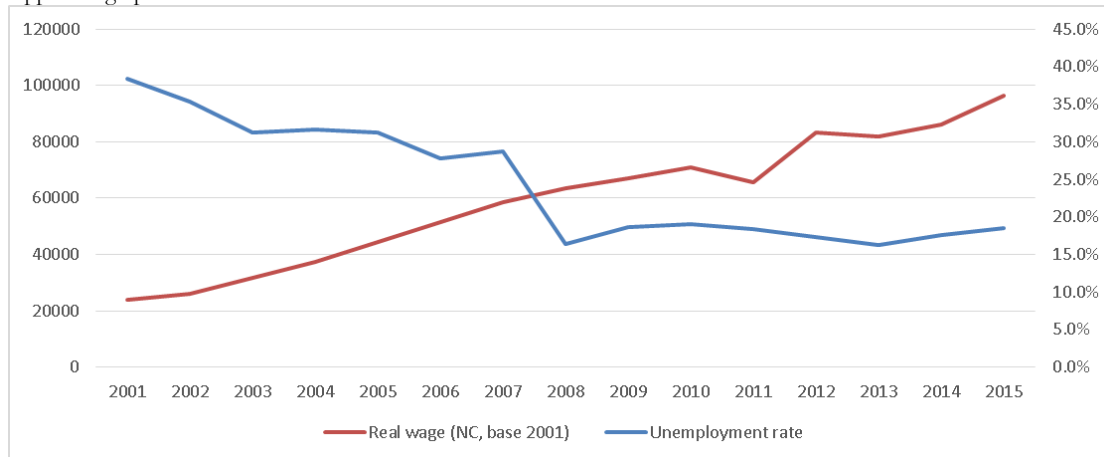
Industry classification to overcome the differences between ISIC Rev. 3 and ISIC Rev. 4

Ind. nr	ISIC Rev. 3		ISIC Rev. 4	
	Item code	Item	Item code	Item
i	Agriculture, hunting, forestry	A	Agriculture, forestry and fishing	A
	Fishing	B		
ii	Mining and quarrying	C	Mining and quarrying	B
iii	Manufacturing	D	Manufacturing	C
iv	Electricity, gas and water supply	E	Electricity, gas, steam and air conditioning supply	D
			Water supply sewerage, waste management and remediation act.	E
v	Construction	F	Construction	F
vi	Wholesale, retail trade, repair of motor vehicles, and personal and household goods	G	Wholesale and retail trade repair of motor vehicles and motorcycles	G
vii	Hotels and restaurants	H	Accommodation and food service activities	I
viii	Transport, storage and communications	I	Transportation and storage	H
			Information and communication	J
ix	Financial intermediation	J	Financial and insurance activities	K
ix	Real estate, renting and business act.	K	Real estate activities	L
			Administrative and support service activities	N
x	Public administration and defence, compulsory social security	L	Public administration and defence compulsory social security	O
xi	Education	M	Professional, scientific and technical activities	M
			Education	P
xii	Health and social work	N	Human health and social work activities	Q
xiii	Other community, social and personal services	O	Arts, entertainment and recreation	R
			Other service activities	S
xiv	Private households with employed persons	P	Private households with employed persons	T

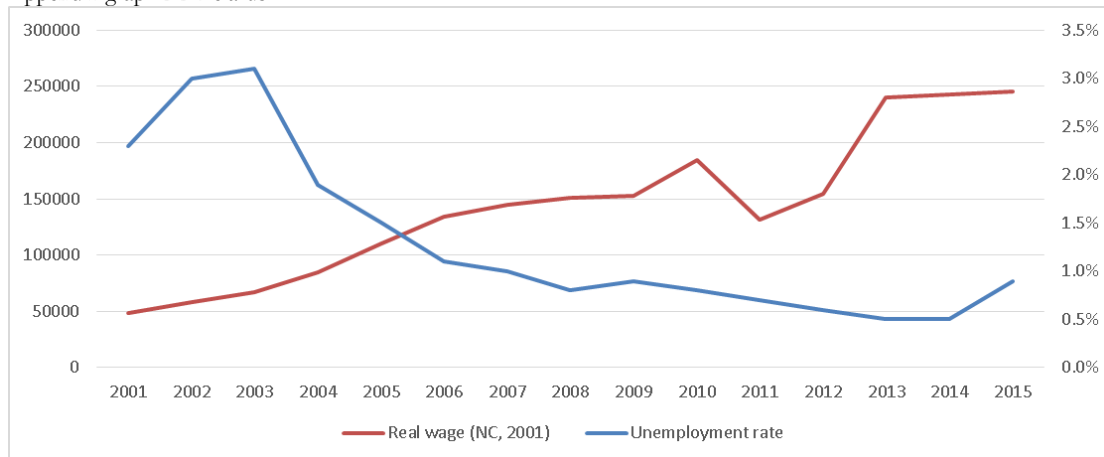
Appendix table 1.1 shows how we have classified the different industries provided in dataset ISIC Rev 3 and ISIC Rev 4 into fourteen comparable industries, named i through xiv. Source: ISIC Rev 4 Structure and explanatory notes: <https://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27>. ISIC Rev 3 Structure and explanatory notes: <https://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=2>

Appendix 2 Graphed real wages and unemployment levels

Appendix graph 2.1 Armenia



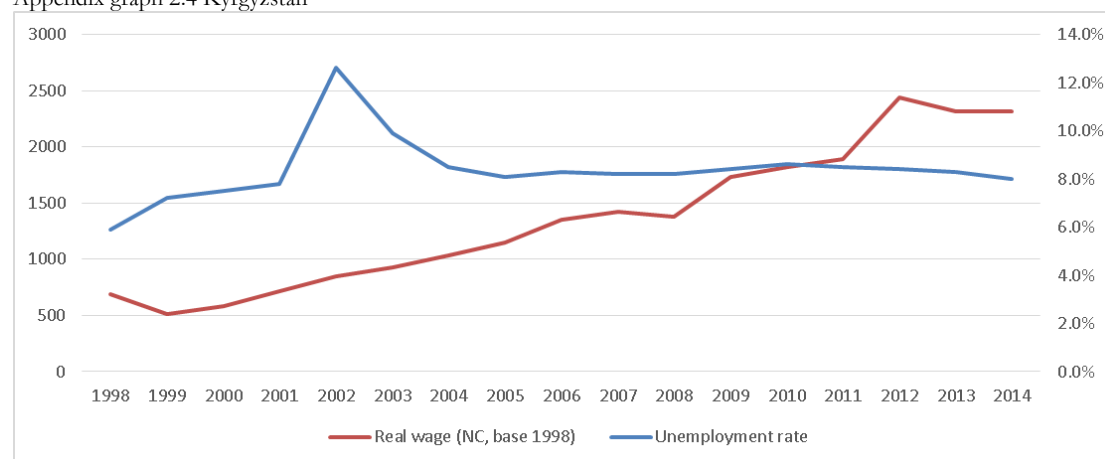
Appendix graph 2.2 Belarus



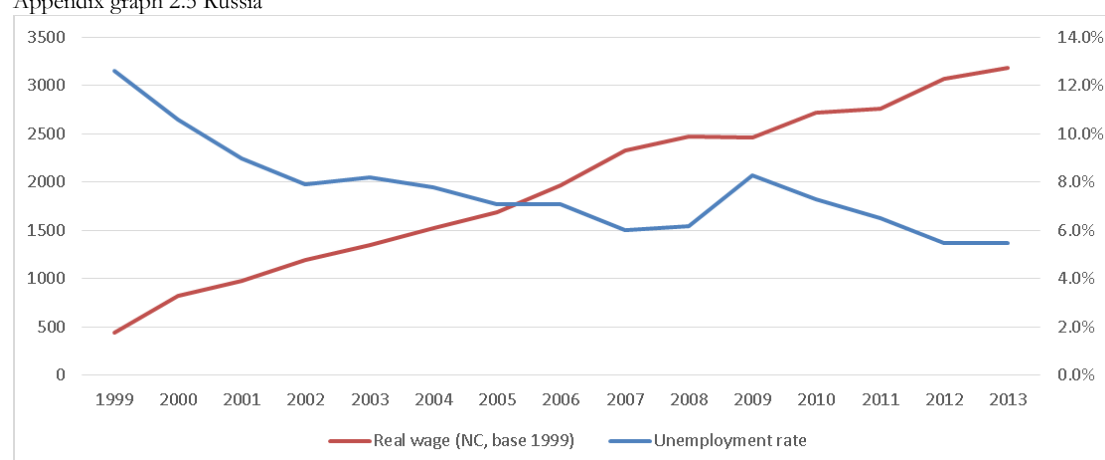
Appendix graph 2.3 Kazakhstan



Appendix graph 2.4 Kyrgyzstan



Appendix graph 2.5 Russia



Appendix 3 Robustness check

To check the robustness of the found relationships between unemployment levels and real wages, appendix table 3.1 shows the results of a regression with nominal wages as the dependent variable. The nominal results are congruent with the findings in table 5.2. The coefficient remains negative and the coefficients of Armenia, Belarus, Kazakhstan and Russia remain significant at a five percent level. Note that while the p-value of Belarus' coefficient is higher than in the case of real wages, it is only two percent.

Appendix table 3.1

Nominal wage dependence on unemployment levels					
	ARM	BLR	KAZ	KGZ	RUS
Coef.	-5654	-1526616	-14544	2	-3667
P-value coef.	0.00	0.02	0.00	1.00	0.00
R2	0.75	0.34	0.80	0.00	0.56

Source: regression using data from UENECE Statistical Division Database and World Economic Outlook (IMF 2016)

Appendix 4 Production diversification

Appendix table 4.1

OECD Herfindahl index	
Country	Herfindahl index
Spain	9.61
Norway	9.81
Netherlands	9.98
Portugal	10.04
Greece	10.22
Italy	10.34
Denmark	10.37
France	10.50
Sweden	10.72
Finland	10.77
Austria	10.80
Belgium	10.85
Slovak Republic	11.39
Mexico	11.64
Slovenia	11.82
Germany	12.26
Czech Republic	12.87
Luxembourg	13.93
Average	11.00

Source: OECD Statistical Analysis Database (2016)

Appendix table 4.2

Value added by country and industry					
Industry (as defined in appendix 1.)	ARM	BLR	KAZ	KGZ	RUS
	2015	2015	2014	2015	2013
i Agriculture, forestry and fishing	21.74%	8.40%	4.78%	16.95%	4.28%
ii Mining and quarrying	3.56%	0.82%	16.05%	1.16%	9.29%
iii Manufacturing	9.86%	23.88%	11.23%	13.67%	17.45%
iv Electricity, gas and water supply	4.85%	3.25%	2.01%	2.26%	2.73%
v Construction	9.57%	10.95%	6.54%	9.18%	5.80%
vi Wholesale, retail trade, repair of motor vehicles, and personal and household goods	11.52%	14.68%	17.32%	20.54%	20.47%
vii Accommodation and food service activities	1.28%	0.99%	0.95%	2.14%	1.00%
viii Information and communication	6.40%	8.64%	11.57%	8.98%	9.64%
ix Financial intermediation and insurance activities	4.22%	4.66%	3.00%	4.26%	5.82%
x Real estate activities, Administrative and support service activities	9.81%	9.11%	11.18%	3.17%	12.12%
xi Public administration and defence, compulsory social security	4.87%	3.97%	2.08%	5.69%	4.91%
xii Education, Professional, scientific and technical activities	4.12%	4.56%	7.75%	7.28%	2.48%
xiii Human health and social work activities	4.00%	3.79%	1.72%	3.10%	3.35%
xiv Other community, social and personal services	4.13%	2.30%	3.79%	1.64%	1.38%
xv Private households with employed persons	0.06%	0.00%	0.02%	0.00%	0.00%

Source: OECD Statistical Analysis Database 2016

Appendix table 4.3

Value added by industry for a selection of OECD countries

Industry	Germany	Luxembourg	Spain	Sweden
i Agriculture, forestry and fishing	0.64%	0.24%	2.56%	1.32%
ii Mining and quarrying	0.15%	0.07%	0.22%	0.41%
iii Manufacturing	22.81%	5.33%	14.24%	17.00%
iv Electricity, gas and water supply	2.96%	1.62%	3.59%	2.98%
v Construction	4.57%	5.06%	5.59%	5.88%
vi Wholesale, retail trade, repair of motor vehicles, and personal and household goods	9.79%	11.92%	11.99%	10.93%
vii Accommodation and food service activities	1.56%	1.87%	6.48%	1.76%
viii Information and communication	9.23%	9.90%	8.90%	11.13%
ix Financial intermediation and insurance activities	4.06%	27.47%	3.92%	4.63%
x Real estate activities, Administrative and support service activities	16.03%	11.33%	14.73%	12.04%
xi Public administration and defence, compulsory social security	6.04%	5.81%	6.55%	4.75%
xii Education, Professional, scientific and technical activities	10.44%	11.86%	10.76%	13.07%
xiii Human health and social work activities	7.71%	5.70%	6.41%	11.05%
xiv Other community, social and personal services	3.74%	1.54%	3.11%	2.99%
xv Private households with employed persons	0.28%	0.27%	0.95%	0.04%

Appendix 5 Similarity in industrial structures

Appendix table 5.1

OECD production similarity index 2015

	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRC	ITA	LUX	MEX	NLD	NOR	PRT	SVK	SVN	ESP	SWE
Austria	1																	
Belgium	0.88	1																
Czech Rep.	0.86	0.82	1															
Denmark	0.89	0.92	0.81	1														
Finland	0.90	0.86	0.85	0.89	1													
France	0.87	0.89	0.79	0.88	0.90	1												
Germany	0.91	0.86	0.88	0.87	0.92	0.87	1											
Greece	0.82	0.79	0.78	0.79	0.82	0.87	0.80	1										
Italy	0.92	0.89	0.84	0.89	0.90	0.90	0.90	0.86	1									
Luxembourg	0.74	0.78	0.70	0.77	0.71	0.75	0.72	0.70	0.75	1								
Mexico	0.86	0.78	0.81	0.81	0.81	0.76	0.81	0.74	0.83	0.66	1							
Netherlands	0.84	0.92	0.80	0.93	0.85	0.90	0.83	0.80	0.87	0.79	0.78	1						
Norway	0.75	0.76	0.74	0.80	0.79	0.79	0.74	0.72	0.75	0.69	0.70	0.80	1					
Portugal	0.89	0.87	0.82	0.87	0.86	0.87	0.85	0.87	0.93	0.73	0.83	0.87	0.73	1				
Slovak Rep.	0.86	0.80	0.92	0.81	0.84	0.77	0.86	0.78	0.82	0.69	0.83	0.79	0.72	0.81	1			
Slovenia	0.90	0.86	0.94	0.86	0.87	0.84	0.90	0.78	0.87	0.75	0.82	0.84	0.75	0.84	0.92	1		
Spain	0.93	0.88	0.84	0.88	0.90	0.89	0.88	0.87	0.94	0.74	0.82	0.85	0.75	0.93	0.83	0.87	1	
Sweden	0.90	0.90	0.86	0.93	0.93	0.89	0.88	0.79	0.87	0.75	0.80	0.89	0.80	0.83	0.85	0.89	0.87	1

Source: OECD Structural Analysis Database (2016)

Appendix table 5.2

Production similarity index OECD

Maximum	0.94
Third quartile	0.88
Mean	0.84
First Quartile	0.79
Minimum	0.66

Source: OECD Structural Analysis Database (2016)

Appendix table 5.3

Production similarity index EMU within OECD													
	AUT	BEL	FIN	FRA	DEU	GRC	ITA	LUX	NLD	PRT	SVK	SVN	ESP
Austria	1												
Belgium	0.88	1											
Finland	0.90	0.86	1										
France	0.87	0.89	0.90	1									
Germany	0.91	0.86	0.92	0.87	1								
Greece	0.82	0.79	0.82	0.87	0.80	1							
Italy	0.92	0.89	0.90	0.90	0.90	0.86	1						
Luxembourg	0.74	0.78	0.71	0.75	0.72	0.70	0.75	1					
Netherlands	0.84	0.92	0.85	0.90	0.83	0.80	0.87	0.79	1				
Portugal	0.89	0.87	0.86	0.87	0.85	0.87	0.93	0.73	0.87	1			
Slovak Rep.	0.86	0.80	0.84	0.77	0.86	0.78	0.82	0.69	0.79	0.81	1		
Slovenia	0.90	0.86	0.87	0.84	0.90	0.78	0.87	0.75	0.84	0.84	0.92	1	
Spain	0.93	0.88	0.90	0.89	0.88	0.87	0.94	0.74	0.85	0.93	0.83	0.87	1
Average of all available EMU countries belonging to the OECD:													0.85
Source: OECD Structural Analysis Database (2016)													

Appendix table 5.4

Production similarity index Russia and OECD										
Russia	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRC	ITA	LUX
	0.78	0.75	0.77	0.78	0.75	0.70	0.73	0.69	0.77	0.64
	MEX	NLD	NOR	PRT	SVK	SVN	ESP	SWE	Average	
	0.87	0.76	0.72	0.76	0.78	0.77	0.75	0.77	0.75	
Source: OECD Structural Analysis Database (2016)										

Appendix 6 Populations of foreign citizens

Appendix table 6.1

Population in ARM by citizenship, population census 2011		
1.	Russia	13,351
2.	Georgia	3,336
3.	Iran	1,527
4.	Ukraine	764
5.	USA	546

Source: National Statistical Service of the Republic of Armenia (2013)

Appendix table 6.2

Population in BLR by citizenship, population census 2009		
1.	Russia	83,561
2.	Ukraine	16,874
3.	Lithuania	2,995
4.	Turkmenistan	2,828
5.	Kazakhstan	1,811

Source: National Statistical Committee of the Republic of Belarus (2009)

Appendix table 6.3

Population in KAZ by citizenship, population census 2009		
1.	Russia	38,609
2.	Uzbekistan	26,886
3.	Kyrgyzstan	9,143
4.	China	5,519
5.	Turkey	3,666

Source: The agency on Statistics of the Republic of Kazakhstan (2011)

Appendix table 6.4

Population in KGZ by citizenship, official estimate 2014		
1.	Kazakhstan	5,000
2.	India	2,000
3.	Tajikistan	2,000
4.	Pakistan	1,000
5.	Russia	1,000

Source: International Labour Organization (2017)

Appendix table 6.5

Population in RUS involved in labour activities by citizenship, population census 2010		
1.	Uzbek	511,500
2.	Tajik	268,600
3.	China	186,500
4.	Ukraine	167,300
5.	Kyrgyzstan	117,700

Source: Federal State Statistics Service (2016)

Appendix 7 Co-variation in economic activities

Appendix table 7.1

OECD correlation with Russian GDP growth

	1993–2015	2005–2015
Austria	0.39	0.9
Belgium	0.39	0.79
Czech Rep.	0.6	0.7
Denmark	0.1	0.73
Finland	0.34	0.88
France	0.38	0.78
Germany	0.38	0.77
Greece	0.21	0.34
Italy	0.27	0.69
Luxembourg	0.32	0.57
Mexico	0.23	0.76
Netherlands	0.18	0.75
Norway	-0.16	0.67
Portugal	0.09	0.44
Slovak Rep.	0.2	0.87
Slovenia	0.28	0.76
Spain	0.34	0.54
Sweden	0.35	0.57
Average	0.27	0.69

Source: IMF World Economic Outlook Database October 2016

Appendix 8 Similarities in rates of inflation

Appendix table 8.1

	Inflation rates by year and country (percentage)					Average inflation
	ARM	BLR	KAZ	KGZ	RUS	
1993	3,731.80	1,190.32	1,662.28	1,086.19	874.62	1,709.04
1994	5,273.45	2,220.90	1,401.99	1,80.68	307.63	1,876.93
1995	176.74	709.30	176.28	43.45	197.47	260.65
1996	18.65	52.69	39.13	31.97	47.74	38.04
1997	14.05	63.82	17.44	23.44	14.77	26.70
1998	8.67	73.02	7.29	10.45	27.68	25.42
1999	0.65	293.73	8.41	35.91	85.74	84.89
2000	-0.79	168.60	13.33	18.71	20.78	44.13
2001	3.15	61.13	8.38	6.91	21.46	20.21
2002	1.79	42.57	5.85	2.06	15.78	13.61
2003	4.54	28.40	6.45	3.08	13.67	11.23
2004	5.93	18.09	6.89	4.11	10.89	9.18
2005	0.72	10.34	7.54	4.34	12.68	7.12
2006	3.43	6.99	8.58	5.55	9.68	6.85
2007	4.55	8.43	10.78	10.20	9.01	8.60
2008	9.02	14.83	17.15	24.53	14.11	15.93
2009	3.54	12.95	7.30	6.85	11.65	8.46
2010	7.27	7.74	7.13	7.76	6.85	7.35
2011	7.65	53.23	8.33	16.59	8.44	18.85
2012	2.54	59.22	5.12	2.77	5.07	14.94
2013	5.79	18.30	5.83	6.61	6.76	8.66
2014	2.98	18.11	6.72	7.53	7.82	8.63
2015	3.73	13.52	6.45	6.50	15.53	9.15
2016	-0.52	12.72	13.09	1.08	7.24	6.72
2017	2.46	12.00	9.25	7.37	5.05	7.23
2018	4.00	9.73	9.00	5.25	4.45	6.49
Average 2000–2015	4.12	33.90	8.24	8.38	11.89	

Nota bene: estimates start after 2015. Source: World Economic Outlook (IMF 2016)

Appendix 9 Similarity in fiscal and monetary policy preferences

Appendix table 9.1

Central bank policy rate by country					
	ARM	BLR	KAZ	KGZ	RUS
2014Q1	7.50	23.50	5.50	6.00	7.00
2014Q2	7.00	21.50	5.50	6.00	7.50
2014Q3	6.75	20.00	5.50	7.00	8.00
2014Q4	8.50	20.00	5.50	10.50	17.00
2015Q1	10.50	25.00	5.50	11.00	14.00
2015Q2	10.50	25.00	5.50	9.50	11.50
2015Q3	10.25	25.00	12.00	10.00	11.00
2015Q4	8.75	25.00	16.00	10.00	11.00
2016Q1	8.25	25.00	17.00	8.00	11.00
2016Q2	7.50	22.00	15.00	6.00	10.50
2016Q3	6.75	18.00	13.00	6.00	10.00
2016Q4	6.25	18.00	12.00	5.00	10.00
Average	8.21	22.33	9.83	7.92	10.71

Source: IMF International Financial Statistics

Appendix table 9.2

Central bank policy rate correlation with RUS				
	ARM	BLR	KAZ	KGZ
Correlation	0.54	0.11	-0.02	0.74

Correlations for 2014–2016. Source: IMF International Financial Statistics

Appendix table 9.3

General government net lending/borrowing					
	ARM	BLR	KAZ	KGZ	RUS
1994	n/a	n/a	n/a	-13.52	n/a
1995	n/a	n/a	n/a	-9.10	n/a
1996	n/a	n/a	n/a	-9.31	n/a
1997	n/a	n/a	n/a	-11.97	-7.40
1998	n/a	n/a	n/a	-13.53	-3.58
1999	n/a	n/a	n/a	-10.70	3.10
2000	n/a	-2.89	n/a	-6.75	2.98
2001	n/a	-2.98	1.92	-5.90	0.67
2002	n/a	-0.74	4.00	-5.17	1.35
2003	-1.67	-0.21	2.58	-4.89	4.56
2004	-1.98	0.01	5.95	-4.33	7.58
2005	-1.95	0.96	7.65	-3.07	7.78
2006	-2.33	-0.68	5.14	-0.96	5.57
2007	-1.76	-9.76	1.23	0.50	4.54
2008	-7.69	-9.28	-1.33	-1.45	-5.87
2009	-4.98	-2.33	1.47	-5.94	-3.19
2010	-2.88	2.56	5.59	-4.71	1.44
2011	-1.49	-0.13	4.27	-5.86	0.39
2012	-1.59	-2.86	4.80	-3.70	-1.19
2013	-1.94	-1.75	1.74	1.87	-1.09
2014	-4.85	-3.49	-6.85	-1.17	-3.48
2015	-4.50	-5.33	-5.65	-4.51	n/a
Average	-3.05	-2.43	2.17	-5.64	0.79

Source: World Economic Outlook (IMF 2016)

Appendix table 9.4

General government gross debt (% of GDP)					
	ARM	BLR	KAZ	KGZ	RUS
1996	40.8	n/a	n/a	n/a	n/a
1997	46.5	n/a	n/a	n/a	n/a
1998	45.2	n/a	n/a	n/a	n/a
1999	39.2	n/a	n/a	n/a	92.1
2000	39.4	n/a	n/a	122.3	55.7
2001	37.8	n/a	n/a	107.3	44.3
2002	38.1	n/a	17.6	106.9	37.5
2003	32.9	n/a	15.0	106.9	28.3
2004	26.4	9.5	11.4	92.9	20.8
2005	20.5	8.4	8.1	85.9	14.8
2006	16.2	11.1	6.7	72.5	9.8
2007	14.2	18.3	5.9	56.8	8.0
2008	14.6	20.8	6.8	48.5	7.4
2009	34.1	26.0	10.2	58.1	9.9
2010	33.7	30.6	10.7	59.7	10.6
2011	35.7	34.9	9.8	49.4	10.9
2012	36.5	32.0	11.7	49.0	11.8
2013	38.0	34.5	12.2	46.1	13.1
2014	41.4	37.3	14.1	52.3	15.9
2015	46.9	53.7	21.9	66.0	16.4
Average	33.9	26.4	11.6	73.8	24.0

Source: World Economic Outlook (IMF 2016)