Business Cycles in South-East Europe from Independence to the end of the Cold War

By

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May, 2011

Abstract

Based on a freshly built data set and relying on a Bayesian Dynamic Factor Model, this paper constructs business cycle indices for five South-East European (SEE) countries (Austria(-Hungary), Bulgaria, Greece, Romania, Serbia/Yugoslavia) to address two questions: to what extent has there been a common SEE business cycle, and has there been synchronisation of business cycles with England, France and Germany? We find limited but increasing business cycle integration before World War I, both within SEE and vis-à-vis the core economies. The trend towards increasing levels of business cycle synchronisation accelerates in the interwar period and is not even interrupted by the arrival of the Great Depression. The onset of the Cold War almost completely extinguishes regional business cycle integration, but the reorientation of some communist countries towards the West (early on by Yugoslavia, from the mid-1970s also by Romania) also sees the re-emergence of a common business cycle vis-à-vis Austria and Germany.

Keywords: South-East European business cycle, national historical accounts, common dynamic factor analysis

JEL classification: N13, N14, C43, E32

Earlier versions of this paper were presented at the EHS and IEHA meetings and to the 5th Conference of the South-East European Monetary History Network. We are grateful to the participants for their spirited discussion and helpful suggestions. We owe a special thanks to the following people in helping us collect the data and/or sharing their data with us: Olga Christodoulaki, Georgios Kostelenos, Georgios Mitrofanis, Max-Stephan Schulze Jeff Williamson, all members of the data collection task force of the South-East European Monetary History Network (SEEMHN), and in particular Alina Blejan, Ljiljana Durdevic, Dragana Gnjatovic, Sofia Lazaretou and Thomas Scheiber. We are grateful to Martin Uebele for discussion on the econometrics of this paper. The usual disclaimer applies. Financial support from the British Academy is acknowledged.
1. Introduction

Despite recent contributions for Austria-Hungary (Schulze 2000, Schulze 2008) and Bulgaria (Ivanov&Tooze 2007), our knowledge of pre-WW II GDP for the SEE countries remains poor (cf. the frank assessment in Good&Ma 1999 and Maddison 2003). The situation does not improve substantially for the post-WW II data as a result of the institutional incentive of the Soviet bloc economies – in our case Bulgaria, Romania and Yugoslavia – to over-report. Conceptual differences between the System of National Accounts (SNA) as developed by the United Nations and the Material Product Accounting (MPA), its East bloc counterpart, further complicate the situation.

But even if we had “perfect” GDP data available, reconstructing the business cycle should never be confined to analysing GDP data alone. State-of-the-art studies on current business cycles (by Stock&Watson, for instance) will rely on some 50 to 100 time series to establish the actual business cycle. The basic idea of this so-called Common Dynamic Factor Analysis (CDFA) is that a cross-section of economic variables, ranging from sectoral output over fiscal and financial variables to trade data share, a common factor. Extracting the common factor for the entire period, in turn, delivers a business cycle index. CDFA can be thought of as a time-series extension of Principal Component Analysis and has been shown to be potentially superior to a business cycle reconstruction based exclusively on GDP (Ritschl&Sarferaz&Uebele 2008).

In this paper, we will follow the CDFA approach. We reconstruct the business cycles of five SEE countries which combined have consistently accounted for more than 85 percent of SEE GDP from the 1870s to the present: Austria(-Hungary), Bulgaria, Greece, Romania and Serbia/Yugoslavia. We will then address two questions: to what extent has there been a common SEE business cycle, and has there been synchronisation of business cycles with England, France and Germany? We find limited but increasing business cycle integration before World War I, both within SEE and vis-à-vis the core economies. The trend towards increasing levels of business cycle synchronisation accelerates in the interwar period and is not even interrupted by the arrival of the Great Depression. The onset of the Cold War almost completely extinguishes regional business cycle integration, but the reorientation of some
communist countries towards the West (early on by Yugoslavia, from the mid-1970s also by Romania) also sees the re-emergence of a common business cycle vis-à-vis Austria and Germany.

We will proceed as follows: In the second section, we will explain why a business cycle reconstruction based on national historical accounts is not necessarily superior to the proposed CDFA and why it might even be worse. Our concerns partly stem from the idiosyncrasies of SEE GDP data, partly from general considerations as to why national historical accounts are unlikely to reflect the true but unknown GDP series. In the third section, we will explain the CDFA methodology, outline the time series we are using for constructing business cycle indices and show how well the chosen methodology works in our case. In the fourth section we will then address the two main question of this paper, i.e. to what extent has there been a common SEE business cycle, and has there been synchronisation of business cycles with England, France and Germany? The fifth section summarises and concludes.

2. Pitfalls of a business cycle reconstruction based on historical national accounts

In a perfect world, we would study SEE business cycles by analysing GDP data on annual frequency (or even higher frequency). In this section, we will explain why historical national accounts are not as helpful for this purpose as they initially appear. Our concerns partly stem from the idiosyncrasies of SEE GDP data, partly from general considerations as to why historical national accounts are unlikely to reflect the true but unknown GDP series.

The most obvious limitation of SEE GDP data refers to the period 1870 – 1918. GDP estimates on an annual basis are available only for Austria-Hungary (Schulze), Bulgaria (Ivanov) and Greece (Kostelenos), of which only the data for the dual monarchy has made it into the Maddison (2003) data set. By contrast, the Kostelenos data have not been universally accepted and the annual estimates of Ivanov have not yet been published (Tooze&Ivanov 2007 and Ivanov 2006 is confined to the benchmark years of 1892, 1899, 1905, 1911, 1921 and 1924). The pre-WW I SEE GDP data reported by Maddison (2003) are on a decadal basis only (except for Austria-Hungary); moreover, the data do not constitute genuine GDP data but the results of proxy estimates by Good&Ma (1999), who draw on (a) the share of non-
agricultural employment in the labour force, (b) the crude birth rate, and (c) letters posted per capita to approximate overall economic activity.¹

For the interwar period, Maddison (2003) reports GDP data for all five countries under consideration. If the detailed critique of the Maddison data for Bulgaria by Tooze & Ivanov (2007) has implications for other countries (as is likely), then we have good reason to be equally sceptical towards the interwar data reported for Greece, Romania and Yugoslavia.

The post-WW I data are beset with yet another problem: the institutional incentive of the East bloc economies – in our case Bulgaria, Romania and Yugoslavia – to over-report. Conceptual differences between the System of National Accounts (SNA) developed by the United Nations and its East bloc counterpart, the Material Product Accounting (MPA)², further complicate the situation.

But even if we leave the idiosyncrasies of SEE GDP data aside for the moment, an argument can be made for relying on CDFA rather than historical national accounts. As a matter of fact, these considerations have led to the use of CDFA even for countries such as the US (Ritschl et al. 2008) and Germany (Sarferaz & Uebele 2007) for which much more reliable GDP are available. First, national historical accounts are normally constructed with an eye towards the level rather than the volatility; this preference determines interpolation techniques which can lead to serious differences in volatility between the reconstruction and the true but unknown GDP series. Second, disaggregate series are often abundant for historical periods, but in many cases do not match national accounting categories very well; CDFA allows us to exploit the business cycle characteristics of these series. Third, CDFA deals better with structural breaks in sub-series than GDP, as CDFA is more flexible in excluding disaggregate time series with serious faults.³

¹ The Greek case is somewhat different; for details cf. Morys (2006).
² It is not easy to compare SNA and MPA in any straightforward sense, but MPA can be thought of as GDP excluding the service sector.
³ For a comparison of both techniques cf. Ritschl et al. (2008) and Aiolfi et al. (2006).
3. Explaining and applying common dynamic factor analysis

3.1 The methodology
This section has three main purposes. First, we want to describe the key idea of the common dynamic factor analysis (CDFA). Second, we want to introduce the reader to the 25 time series to be employed for the CDFA. Third, we want to demonstrate that the common dynamic factor analysis is a viable alternative to the reconstruction of business cycles based on historical national accounts.

CDFA is best understood as an application of principal component analysis (PCA). PCA involves a statistical procedure that transforms a number of possibly correlated variables into a smaller number of uncorrelated variables called “principal components”. The first principal component accounts for as much of the variability in the data as possible, and each succeeding component accounts for as much of the remaining variability as possible. While we generally require as many components as variables to reproduce the original variance structure, we are usually able to account for most of the original variability using a relatively small number of components.

The principal components (also referred to as principal component scores) are obtained as follows⁴: Let \( p \) be the number of variables (a maximum of 25 in our case) and let \( n \) be the number of observations (the number of years under consideration in our case); the \( n \times p \) matrix \( X \) is hence our data matrix. Let \( \Sigma \) further be the ordinary (Pearson) correlation matrix (of dimension \( p \times p \)) pertaining to the data matrix \( X \).

\[ \Sigma \text{ will then have } p \text{ eigenvalues} \]

\[ \lambda_1 \geq \lambda_2 \geq \ldots \geq \lambda_p \geq 0 \]

and, correspondingly, \( p \) eigenvectors \( u_1, u_2, \ldots, u_p \).

The \( k \)-th principal component – \( p_{ck} \) of dimension \( n \times 1 \) – is then obtained as

⁴ Cf. Johnson&Wichern (2002), chapter 8. The calculation as performed by EViews 6 is marginally different as explained in the EViews Users Guide.
\[ p_{c_k} = ( (u_k)^T X_j)^T \]

In extension, all principal component scores – a matrix \( p_c \) of dimension \( n \times p \) – can be obtained as:

\[ p_c = (p_{c_1} p_{c_2} \ldots p_{c_p}) = ( (u_1 u_2 \ldots u_p)^T X_j)^T \]

The basic idea of CDFA is to take only the first principal component and to interpret this component in an economically meaningful way. In our case, this means that we need to come up with a certain number of variables which promise to exhibit some form of correlation with GDP. CDFA then implies that a cross-section of such economic variables shares a common factor; extracting the common factor for the entire period, in turn, will deliver a business cycle index. We suggest the inclusion of the following list of economic variables which range from sectoral output over fiscal and financial variables to trade data (table 1). Some of the variables needed to be calculated based on the collected raw data (CPI, terms of trade, real effective exchange-rate).

3.2 Data sources
South-Eastern Europe is often seen as \textit{terra incognita} by cliometricians but our data collection efforts show that a “new economic history” of SEE could easily be written. Based largely on Statistical Yearbooks (publication of which started shortly after independence of the SEE countries in the 19th century), we have been able to construct a minimum of at least 16 annual time series for each country for the period 1870 – 2000 (with the exception of war years; due to independence occurring later, data for Bulgaria, Romania and Serbia/Yugoslavia start in 1887, 1881, and 1886, respectively). Additional sources were used in particular for the post-WW II period, where local sources for Bulgaria, Romania and Yugoslavia were double-checked with Western sources on Soviet bloc countries (mainly by the Vienna Institute for International Economic Studies, one of the few Western institutes with reliable data).

[Insert Table 1 about here]
on Eastern Europe for the Cold War period). Table 2 summarises the estimation periods and the number of underlying time series for each country.

3.3 General comments on estimation

Raw data series were transformed into logarithms (except for domestic interest rate, terms of trade and real effective exchange rate where levels were used) and subjected to the Hodrick-Prescott filter (with a smoothing parameter of 6.25). The resulting 22 cyclical series (for each country) were then standardised by adjusting the mean to naught and the standard deviation to unity; this step is crucial in ensuring that each series is given equal weight in establishing the business cycle.

Calculations were carried out with Matlab relying on a code developed by Gary Koop (University of Strathclyde, UK). The order of the autoregressive component of the idiosyncratic component was set at one, but choosing higher orders seemed to influence results only marginally. In line with the path-breaking Burns&Mitchell (1946) study and later research, we assume a typical average length of eight years for a business cycle; different assumptions were tried out but our findings hardly changed.

We interpret the first factor extracted as the business cycle for the specific country under investigation (“first factors” in CDFA is the equivalent to the first principal component in principal component analysis). Correlation coefficients are helpful in comparing the business cycle index with the 22 individual time series that went into it. This procedure allows us to establish which of the individual time series really drives the national business cycle. While there are obviously differences between the 15 business cycle reconstructions we carry out (5 countries with 3 distinct estimation periods each, i.e. pre-WW I, interwar, and post-WW II), some general observations can be made: manufacturing, construction and transportation normally exhibit the highest correlation with the business cycle (often 70% and above), followed by monetary aggregates (M0, M3), exports and government revenue. In our view (cf. also Backus&Kehoe 1992 and Uebele 2010), the high level of correlation can either result from the time series being genuinely important for the business cycle – i.e., a good proxy from an economic point of view, such as manufacturing and construction – or because the time series represents very accurately reported historical data (M0
and government revenue would fall in this category). As both conditions are rarely fulfilled in applied work, there is usually a trade-off between proximity to the business cycle from a theoretical perspective and data quality. This trade-off is particularly pronounced in cases where several key time series are not accurately reported; in these situations (Greece pre-WW I, for instance), the business cycle is largely the result of a limited number of time series which were reported with great precision (M0, for instance, in the case of pre-WW I Greece). This finding vindicates the somewhat eclectic approach of CDFA which relies on a large number of time series.


Pre-WWI: 1870s - 1913
Table 3 shows the correlations of the national business cycles – i.e. our measure of business cycle integration – among the SEE countries as well as between the SEE countries and the three core countries of Western Europe, i.e. England, France and Germany. For each country pair we provide correlations for three different periods: 1883-1913, 1893-1913 and 1903-1913. While shortening the period makes it more difficult to ascertain statistical significance, it should become clear in the following why reducing the full period\(^5\) is warranted.

[Insert Table 3 about here]

As we are not in a position to provide correlation for Serbia and Bulgaria for the full period 1883 – 1913, we shall begin our observations with Austria-Hungary, Romania and Greece. Looking at the full period, the average correlation (of 0.24, -0.07 and 0.32) stands at 0.16. This is certainly not a particularly high value, but it is worth pointing out that Bordo&Helbling (2010) find an average bilateral output correlation (in their case based on first differences of log output) of only 0.03 for the 120 countries in their sample (for the period 1880-1913).

\(^5\) For Austria-Hungary, Greece and Romania we could add eight, eight and two years, respectively (cf. table 2), which would only increase the country-pair of Austria-Hungary and Greece by a meaningful amount of years. For reasons of comparability we have also confined the data of these three countries to the period 1883-1913.
Crucially, for each of the three country pairs, the correlations rise the closer we come to WW I. For the country pair of Austria-Hungary and Romania – two neighbouring countries which were incidentally also the two largest SEE economies of the time – the correlation rises from 0.24 (1883-1913) over 0.31 (1893-1913) to 0.63 (1903-1913). In other words, the data suggests a trend of increasing business cycle integration before WW I.

Such a trend is easily detected in figures 1 and 2. Eyeballing the data for the full period (figure 1) does not suggest a high degree of business cycle integration for the early period. If we then confine the sample to the decade before WW I (figure 2), a pattern of co-movement is apparent. Moreover, for the latter period we recognise upswings and downswings which are well-documented for other countries: (a) the long upswing in the early 1900s, a period of global boom which ended in the bust of the American banking crisis of 1907; (b) the impact of the American banking crisis on the rest of the world; (c) another upswing starting in 1909/10 which lasted until WW I.

[Insert Figure 1 about here]

[Insert Figure 2 about here]

It is worth highlighting several issues: first, turning points are well-synchronized: they either coincide (1912) or are no more apart than one year (1907 for Austria-Hungary and Greece versus 1906 for Romania; 1909 for Romania and Greece versus 1910 for Austria-Hungary); second, the impact of the American banking crisis (failure of the Knickerbocker trust in October 1907) was both instantaneous and prolonged. While we do know about the impact of the American banking crisis on some peripheral countries, Italy for instance, we are providing the first quantitative evidence that the same was true for the SEE countries. Third, while the upswing of the 1910s lasted for most countries until WW I, it was cut short in SEE in 1912 due to the Balkan Wars (1912-13); as figure 2 shows, 1912 is the turning point for all three countries.

We also find steadily increasing business cycle integration when looking at the correlation of Austria-Hungary, Romania and Greece vis-à-vis England, France and Germany: the average bilateral correlation (of the 9 country pairs) increases from 0.17
(1883-1913) over 0.20 (1893-1913) to 0.39 (1903-1913). This average number masks important differences: Austria-Hungary’s business cycle integration with Western Europe does not change much over time and remains higher than the integration levels of either Romania or Greece. Put differently, if SEE steadily increased business cycle integration with Western Europe before WW I, then this is the result of countries such as Romania and Greece being increasingly synchronized with the dual monarchy which, in turn, had been (moderately) well-integrated with England, France and Germany for some time.

Our quantitative findings are then supportive of an interpretation of the dual monarchy often found in the literature: i.e., the dual monarchy as a huge empire (with approx. 40 million inhabitants it was the largest peripheral country in Europe) with a Western half many parts of which took part in the process of 19th century continental European industrialisation, and an Eastern half which remained predominantly agrarian and whose economic structure had more in common with neighbouring countries further to the East than the Western part of the dual monarchy.

Somewhat unsatisfactory are our results as far as Serbia and Bulgaria are concerned. On the one hand, we obtain positive correlation between both countries and some of their direct neighbours (Serbia vis-à-vis Austria-Hungary, Bulgaria vis-à-vis Romania), but most other correlations are negative. There are two potential explanations: Either both Serbia and Bulgaria enjoyed only low synchronisation levels with other SEE countries except for their direct neighbours. While possible, this would be in some contradiction to our findings for the country-pair Austria-Hungary and Greece – the two geographically most distant countries in our sample – which exhibited steadily increasing levels of business cycle integration.

Alternatively, the result could be driven by data series of insufficient length. The time series for Serbia and Bulgaria start only in 1886 and 1887, respectively, compared to 1875 for Austria-Hungary and Greece and 1881 for Romania (table 2). Moreover, the Serbian data is not only shorter but it also processes fewer time series than any of the other four countries (16 series as opposed to 17 series – for Greece and Romania – and 19 series – for Austria-Hungary and Bulgaria). As a consequence, the confidence intervals for Serbia and Bulgaria are much wider than for Austria-Hungary, Greece and Romania.
If the issue were to be one of time length – as opposed to the quality of the reported data -, then the only solution would be to extend our data series beyond 1886 (Serbia) and 1887 (Bulgaria). The current limit is set by the publication of the first *Statistical Yearbook* (our main source for both countries), but we might be able to extend at least some of the time series (such as exports, imports and revenue) further back in time based on other sources.

We mentioned earlier the very low levels of business cycle synchronisation reported in Bordo&Helbling (2010) for a sample of 120 countries for the period 1880-1913, but it is worth pointing out that results were obtained based on historical national accounts. How then do our findings compare to other studies relying on the same methodology? The closest equivalent is Uebele (2010) who studies business cycle integration between England, France and Germany for the period 1862-1913. He finds the following correlations (table 2): England-France: 0.54; England-Germany: 0.59; France-Germany 0.69.

For the core countries of England, France, and Germany, then, Uebele finds synchronization levels (for the entire period of 1862-1913) which we, for the SEE countries, can only establish for the decade preceding WW I. The same is true for synchronization levels of SEE countries with the West European core countries. The only exception is Austria-Hungary which (for the entire period of 1883-1913) exhibits synchronization levels vis-à-vis England, France and Germany not much below what Uebele finds among these three countries (average bilateral values of 0.47 versus 0.61).

**The Interwar Period: 1919-1939**

Table 4 shows the bilateral correlations for the interwar period (1919-1939). Compared to the period before WW I, we see a “quantum leap” in business cycle synchronization. For all five countries, the average correlation stands at 0.49, compared to 0.16 for the period 1883-1913. Our finding of increasing business cycle synchronization from the pre-WW I period to the interwar period is in line with Bordo&Helbling (2010), even though the increase in their findings – from 0.03 to 0.17 – takes place at a lower level given their reliance on historical national accounts.
A full picture of business cycle integration emerges only when we look more closely at different country pairs. Greece’s business cycle was least closely integrated with the other four SEE countries, with an average value of 0.12. If we exclude Greece, the average correlation between the remaining four SEE countries increases from 0.49 to 0.73. Within this group of countries, Bulgaria, Romania and Yugoslavia were particularly well integrated, with an average correlation of 0.77. Figure 3 shows just how similar the business cycles of those three countries were: Peaks are either identical (1929 and 1937) or occur in subsequent years (1920 for Romania versus 1921 for Bulgaria and Yugoslavia); the same is true for troughs (1926 for Bulgaria and Romania versus 1927 for Yugoslavia; 1933 for Romania and Yugoslavia versus 1934 for Bulgaria).

Figure 3 also suggests that business cycle integration did not decline after the onset of the Great Depression in 1929. Table 5, which contains bilateral correlations for the period 1929-1939, shows that the average correlations actually increased after 1929: the average correlation between all five countries increased from 0.49 for the full period to 0.53 for the period 1929-1939. If we exclude Greece for its outlier status (cf. above), the average correlation increases from 0.73 to 0.77. Thus, while “conventional wisdom” holds that the world economy disintegrated after the onset of the Great Depression, we find the exact opposite for the SEE countries as far as business cycle integration is concerned.

Our empirical findings suggest two questions: first, why does Greece stand out from our sample as less closely integrated? Second, what explains that business cycle synchronization increased after the onset of the Great Depression? In the following, we will argue that both questions are intertwined. We shall address the Greek conundrum first.
Figure 4 replicates figure 3 but adds the Greek business cycle. Two of the five turning points are identical to the other three countries: the trough of 1926 (identical to Bulgaria and Romania, with Yugoslavia one year later) and the peak of 1929 (common to all). Different by at least two years are, however, the other three turning points: the 1923 peak for Greece (as opposed to 1920/1921 for the other three countries), the 1931 trough of the Great Depression (1933 for Romania and Yugoslavia and 1934 for Bulgaria) and the 1934 peak (1937 for the other three countries). The late first peak in 1923 is probably best explained on political grounds: while all five SEE countries were involved in WW I, hostilities effectively continued in the case of Greece due to the Greco-Turkish war (1919-1922). More interesting from an economic point of view is the different timing after the onset of the Great Depression: Greece reaches the trough only two years after the onset of the Great Depression (in 1931), while Romania, Yugoslavia (in 1933) and Bulgaria (1934) need four and five years, respectively. How can we account for this difference?

While a definite answer to this question cannot be given at this stage of our research, it is tempting to see a connection to the different stance the SEE countries took with respect to the gold standard. In the 1920s the SEE countries had reestablished the gold link of their currencies but they followed different paths in the 1930s. Greece was the first country (not only in SEE but globally) to follow the UK in leaving the gold standard, a decision which was followed by a government default in early 1932. By contrast, Bulgaria, Romania and Yugoslavia wanted to maintain the gold standard, even if that implied a prolonged period of deflation and, as it turned out, could not be achieved without imposing capital controls. Seen from the perspective of our business cycle reconstruction, Greece seems to have opted for the better solution: the recovery came two to three years quicker, as devaluation helped improve the current account (and, in turn, GDP) more quickly than the policy alternative of deflation would have done. Moreover, the debt default helped improve the budgetary situation of the Greek government. Our econometric findings are certainly supportive of Ivanov&Tooze (2011) who contrast the Greek and the Bulgarian experience in the 1930s and try to explain, from a political economy perspective, why the two neighbouring countries opted for different approaches. More broadly speaking, our findings are also in line with Eichengreen&Sachs (1985) who
showed that an early exit from the gold standard led *ceteris paribus* to a quicker recovery.

The arguments advanced to explain the Greek case might also provide an answer to the second question we referred to above; i.e., why do we witness increased business cycle integration after the onset of the Great Depression? The disintegration of the world economy after 1929 is normally explained as follows: not only was the severity of the crisis different in different countries, but the crisis generated policy responses likely to undermine business cycle integration. The rise of protectionism and the widespread introduction of capital controls are seen as the main culprits in this context.

On closer inspection, developments in the 1930s were more complex: protectionism was accompanied by the rise of preferential trading agreements, and the quasi-universal gold standard of the late 1920s was abandoned in favour of “currency blocs” such as the sterling area and the gold bloc. Similarly, capital controls were applied selectively. The logic of this process was that members belonging to the same “trading area” or “currency bloc” might well experience increased economic integration (at the expense of the rest), thereby leading to enhanced business cycle synchronization.

These forces seem to have operated in the case of SEE with equal force. If we look at the entire period (table 4), Germany stands out as more integrated with SEE, with an average correlation of 0.53 compared to 0.13 for England and 0.31 for France. This value then even increased to 0.60 after the onset of the Great Depression. Our findings on business cycle synchronization are then in line with a large body of research describing the increasing importance of Germany to the East and SEE countries in the 1930s (Feinstein&Temin&Toniolo 2008).

**Post World War II: 1950-1989**

At first glance, it might not make sense at all to extend our study into the post-WW II period; as a result of the political decisions taken at Yalta, Austria and Greece fell into the Western and Bulgaria, Romania and Yugoslavia into the Eastern camp, leaving little space for a common regional business cycle before the end of the Cold War in 1989.
We reject such reasoning on three grounds. First, even if there were no common business cycle at all, it would still be of greatest interest to see whether there was, at least, some form of business cycle synchronization among Bulgaria, Romania and Yugoslavia. We are not aware of any study into business cycle synchronization of the Soviet bloc countries but the question itself merits investigation, not least because economic integration was one of the explicit goals of Comecon, the Soviet Union-led “Committee for economic integration” which comprised of six Eastern European economies: a high degree of business cycle integration would suggest that one of Comecon’s goal was, at least partly, achieved.

Second, a common business cycle could be the result of common external shocks which affected both West and East. The two most likely candidates would be the oil price shocks of 1973 and 1979. The impact of both shocks is well-documented for Western countries but also thought to have been pronounced for the Soviet bloc countries.

Third, analyzing the SEE members of the East bloc seems of particular interest for the following reason: With Yugoslavia and Romania, SEE contained the two “unruly children” of the Soviet bloc. In turning away from the East bloc, Yugoslavia and Romania increasingly opened up towards Western Europe. Following the break with Stalin in 1949, Yugoslavia started to open economically towards the West by increasing trade and importing capital. Even the free movement of labour with the West – the prevention of which was the whole purpose of the Iron Curtain – resumed in the 1960s, as the Gastarbeiter experience of many Yugoslav workers in West Germany demonstrates (Lampe 2000). A similar process involved Romania, even though it started later and never proceeded as far as in the Yugoslav case. Following the oil price shock of 1973 (which, according to our calculations, hit the Soviet bloc countries on average two years later than Western countries but the impact was no less severe), Romania was forced to increase trade and obtain loans from Western countries, which, among others, led to Romania becoming a member country of the IMF in the early 1980s.

Table 6 shows business cycle integration for the period 1950 – 1972, i.e. before the first oil price shock (1973). Yugoslavia is negatively correlated with Bulgaria and

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6 The Comecon consisted of the Soviet Union, Poland, Czechoslovakia, Hungary, Romania, Bulgaria and East Germany.
Romania but exhibits positive correlation vis-à-vis the Western economies. This effect is particularly pronounced with West Germany (correlation of 0.48). Vice versa, Bulgaria and Romania themselves exhibit a positive correlation (0.56) but both are negatively correlated to Austria, Greece and West Germany. Our findings are again supported by eyeballing the data (figures 5 and 6). Bulgaria and Romania share peaks and troughs, as do Yugoslavia and Germany. The implication of this is that Yugoslavia was, as far as business cycle integration is concerned, more aligned with Western countries, notably West Germany, than with its Eastern peers.

[Insert Table 6 about here]

[Insert Table 7 about here]

[Insert Figure 5 about here]

[Insert Figure 6 about here]

Turning to the 1970s and 1980s (table 7), the correlation between West Germany and Yugoslavia remains high at 0.42. Interestingly, Romania appears to be “switching sides”: while, in the 1950s and 1960s, Romania only exhibited positive values vis-à-vis Bulgaria, correlation with Bulgaria then turned negative but positive vis-à-vis Yugoslavia (0.57) and West Germany (0.34). In other words, Romania’s political and economic efforts to open up towards Western Europe were accompanied by a process of business cycle synchronization with the West and business cycle dis-synchronization with the East. This then left Bulgaria as the only genuine “East bloc” country in our sample with negative correlation values throughout.
5. Conclusion

This paper represents the first attempt ever to construct business cycle indices for the South-East European (SEE) countries from late 19th century independence to the present day. Constructing these indices allowed us to address two key questions: to what extent was there a common business cycle among the SEE countries, and to what extent was the business cycle of individual SEE countries and/or SEE as a whole synchronized with the business cycles of the major European economies, i.e. England, France, and Germany.

In a perfect world, we would study business cycles by analyzing GDP data. We first explained why historical national accounts are not necessarily as suited for this task as they might appear initially. Our concerns partly stemmed from the idiosyncrasies of SEE GDP data, partly from general considerations as to why national historical accounts are unlikely to reflect the true but unknown GDP series. We then suggested Common Dynamic Factor Analysis (CDFA) as a promising alternative to construct business cycle indices.

The remainder of the paper was devoted to addressing two key questions: to what extent was there a common business cycle among the SEE countries, and to what extent was the business cycle of individual SEE countries and/or SEE as a whole synchronized with the business cycles of England, France, and Germany. We found limited but increasing business cycle integration before World War I, both within SEE and vis-à-vis the core economies. The trend towards increasing levels of business cycle synchronisation accelerated in the interwar period and was not even interrupted by the arrival of the Great Depression. The onset of the Cold War almost completely extinguished regional business cycle integration, but the reorientation of some communist countries towards the West (early on by Yugoslavia, from the mid-1970s also by Romania) also saw the re-emergence of a common business cycle vis-à-vis Austria and Germany.
Table 1
Annual data series for common dynamic factor analysis

**Sectoral output indicators**
- #1 agricultural production
- #2 communication
- #3 industrial output
- #4 mining
- #5 construction
- #6 transportation
- #7 fixed investment

**Fiscal indicators**
- #8 government expenditure
- #9 government revenue

**Financial indicators**
- #10 narrow money
- #11 broad money
- #12 consumer price index
- #13 short term interest rate
- #14 mortgage credit

**Trade indicators**
- #15 terms of trade
- #16 real effective exchange rate
- #17 exports
- #18 imports
- #19 trade balance

**Other indicators**
- #20 external spread
- #21 foreign capital inflows
- #22 foreign short term interest rate
- #23 foreign output
- #24 real wage
- #25 population
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### Table 3
Bilateral correlations of cyclical component 1883-1913, 1893-1913, 1903-1913

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Sources: Cf. text.

### Table 4
Bilateral correlations of cyclical component 1919-1939

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Sources: Cf. text.

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Bilateral correlations of cyclical component 1929-1939

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Table 6
Bilateral correlations of cyclical component 1950-1972

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Sources: Cf. text.

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Bilateral correlations of cyclical component 1972-1988

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Sources: Cf. text.
Figure 1: Business cycles of Austria, Greece and Romania, 1881 - 1913.

Source: Own calculations based on data as described in the main text.

Figure 2: Business cycles of Austria, Greece and Romania, 1903 - 1913.

Source: Own calculations based on data as described in the main text.
Figure 3: Business cycles of Bulgaria, Romania and Yugoslavia, 1919 - 1939.

Source: Own calculations based on data as described in the main text.

Figure 4: Business cycles of Bulgaria, Greece, Romania and Yugoslavia, 1919 - 1939.

Source: Own calculations based on data as described in the main text.
Figure 5: Business cycles of Bulgaria and Romania, 1955-1977.

Source: Own calculations based on data as described in the main text.

Figure 6: Business cycles of Yugoslavia and Germany, 1954-1972.

Source: Own calculations based on data as described in the main text.
Bibliography


