

WORKING PAPER SERIES

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EFFECTIVE EXCHANGE RATES OF THE BULGARIAN LEV 1879-1939

Working Paper No.04/2009

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Abstract

The paper constructs the first series of *nominal* and *real* effective exchange rates of the Bulgarian Lev from its establishment in 1879 until 1939. The dynamics of both indicators during the Classical Gold Standard fits the general picture of exchange rate development of other European countries while their movements in the Interwar years reflects the exchange rate policy of the monetary authority and the price effects of the Great Depression. The study also provides econometric estimation of the impact of the real effective exchange rates and foreign demand on Bulgaria's real export performance allowing for some policy implications.

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* Acknowledgements: The authors are grateful to Peter Bernholz (University of Basle) for the useful cooperation and comments particularly with respect to reconstructing the earliest data of the exchange rates, as well as to Roumen Avramov (Centre for Liberal Strategies-Sofia), Nikolay Nenovsky (University of National and World Economy -Sofia) and Luca Fantacci (Bocconi University) for their useful comments. We would like to thank also Ivaylo Nikolov (Loughborough University) for providing us with Maddison data and Matthias Morys (Oxford University) for providing us with price data for Austria-Hungary. Some of the data has been collected by Martin Ivanov thanks to the Visiting research program of the Bulgarian National Bank in the second half of 2006.

1. Introduction

Recently effective exchange rates for many ‘core’ countries and some of the ‘periphery’ have been subjected to detailed scientific research. Solomou and his collaborators did the painstaking job of data collection and developing a cross-country as well as cross-time comparability of among the different regions of the Classical Gold Standard. In a seminal paper with Catao (2000) Solomou questioned the conventional wisdom of the ‘fixed exchange rate regime, reflecting the predominance of an Anglo-American perspective’. This research aims at the inclusion of yet another area of the ‘periphery’ that was generally omitted so far when the operation of the Gold Standard and the interwar gold-exchange regime is in review.

Our main purpose is to construct nominal and real effective exchange rates (EERs) of Bulgarian Lev. The hope is that compiling long-term historical series will encourage further studies on Bulgarian quantitative economic history. Applying today’s widely accepted economic methodology will enable us to test the potential of adjustment mechanisms in the Europe’s southeastern fringe. The current paper was inspired by the South-Eastern European Monetary History Network (SEEMHN) Data Collection Project¹. This would be a second such attempt in the SEE region after the work of Lazaretou (1995) on Greek nominal and real exchange rate development. It would however try to follow more closely the Solomou’s methodology and calculate the effective ERs of the Lev based on a basket of the currencies of the Bulgaria’s main trading partners.

The current paper is divided into three parts. The main body of the research would be presented in the second part additionally subdivided into three sections. In the first subsection we make a brief overview of the applied methodology. The second and the third subsections focus on two key from analytical point of view periods 1879-1913 and 1927-1939. In the last part of the article we use standard econometric techniques to study some determinants of export behaviour and particularly the impact of REER and external demand on export development. Such an analysis could provide us with interesting insights on whether and under what circumstances REER influenced export development. Moreover, the quantitative analysis would allow us to give some suggestions on the devaluation dilemma in the 1930’s. Detailed presentation of data sources is presented in the Appendix.

¹ The South-East Europe Monetary History Network was initiated in 2006 by the central banks of Albania, Austria, Bulgaria, Croatia, Greece, Romania, Serbia, Slovenia and Turkey.

2. Effective exchange rates of the Bulgarian Lev

2.1 Methodology

According to a BIS economic paper on measuring international cost and price competitiveness (Turner and Van't Dack 1993) three elements are important for ensuring proper construction and interpretation of nominal effective exchange rates: (1) the choice of currencies to be included, (2) the weighting structure to be assigned to the set of currencies and (3) the base period.

Unfortunately, bilateral exchange rates of Bulgarian Lev (BGL) against foreign currencies are not available from the dawn of the newly constituted Bulgarian principality in 1879. Therefore, it was not possible to collect data from a single official source, hence, for the first two decades in review we had to compensate for the lacking quotations of the Bulgarian National Bank with data drawn from either the daily press or from the research of other economists and historians² (Kioseva 2000, Avramov, 2007).

As a result of the Russian-Turkish War of Independence 1877-78 and the long traditions of currency plurality in the region it took roughly a decade for BGL to establish its dominance on the local money market. Almost six months after the establishment of the Bulgarian National Bank a special law was enacted declaring the Lev as a legal tender in Bulgaria. The Lev was to be exchanged against the French Franc in ratio of 1:1 thus unilaterally observing the Latin Monetary Union convention. The first monetary law in Bulgaria was, however, very liberal in the sense that it accepted all LMU currencies plus the Russian silver Rubles and the Ottoman Lira as legal tenders as well (Nedelchev, K. 1940, p.15). Furthermore, other currencies which were not established in compliance with the LMU like the Austrian Guilders, the Serbian Dinar and the Romanian Leu were also allowed to freely circulate in the country. Under these circumstances and as a result of the enforced high price of the silver Russian Ruble maintained long after its denomination in the neighbouring countries³, the local market was flooded by foreign silver coins. After several unsuccessful attempts to limit their circulation, they were ultimately demonetized by mid 1887⁴.

² We also employed data generously provided by Peter Bernholz (University of Basle). For a detailed description of data see the Appendix.

³ An artificial exchange rate of 1 Rubles against 4 Francs was set by the provisional Russian administration immediately after the war of 1877-78 in Bulgaria, Serbia and Romania. In 1880 Romania demonetized the Russian silver Rubles at the price of 3.5 Francs while Serbia decreased the exchange rate to 3.3. In 1882 Turkey demonetized all foreign silver coins withdrawing them from circulation (BNB, 1929).

⁴ According to Kioseva (2000, p. 72) foreign coins comprised nearly 50 percent of the total monetary base as late as 1887.

For almost 10 years various foreign currencies were more popular than the Lev as the silver currencies dominated the domestic transactions while gold ones were used for foreign trade payments. Unfortunately, information of the price at which Bulgarian Lev was exchanged against the main European currencies between 1879 and 1887 did not survive. For the purpose of calculating EERs of the Bulgarian Lev relevant to its foreign trade transactions, it was these developments that allow us to confidently construct the missing data by applying the legal parity of the BGL against the French Franc and calculating cross rates.

After mid 1887 BGL became the single currency used in all transactions within Bulgarian borders. Indeed, this increased the interest of printed media to its daily quotations. It was a painstaking but rewarding job to browse most of the newspapers published in 1880s and 1890s and to collect data on the exchange rates of the Lev against the main European currencies. It was in this way we manage to reconstruct the ERs developments between June 1887 and November 1893. It should be pointed out, however, that for the most of the period the data is sporadic and we were able to find quotations for only few months in a year. The situation drastically improves at the end of 1893 when a specialized economic newspaper *Bulgarsky targovski vestnik* came to life. It published 3 to 4 daily quotations a week of the rate at which the Imperial Ottoman Bank's office in Sofia exchanged the Lev against the French Franc, the British Pound, the German Mark, the Austrian Guilder, the Turkish Lira and the Russian Ruble. In February 1897 the State Gazette started publishing the official exchange rates of Bulgarian National Bank

Thus, for most of the period in review (i.e. 1897–1939) the exchange rate data was collected from the ER section in the State Gazette. Normally, BNB reported daily quotations of which we used one observation per week trying to draw it from or near the following dates – the 7th, the 14th, the 21st and the 28th of each month. As the next step we have calculated the monthly EX as a simple average of these four observations. For the period from Jan. 1887 – Feb. 1897 we apply the same methodology (same dates) given all available data. Although most of information in this second period was not complete for constructing annual averages (up to Jan 1892), we observed weak exchange rate volatility which allowed us to extend the series without losing consistency.

From the information reported in the newspapers we used the rate of exchange of banknotes for the period from 1887-1893 and the rate of bills of exchange for the longer time span from 1893-1939 as this was the way most of the trade was financed. Then, using a simple average between 'buy' and 'sell' rates, we calculated the ER of bills of exchange, drawn against all the main commercial partners.

The choice of currencies which are to be included in the basket is determined by our purpose to cover as most as possible of Bulgaria's foreign commodity exchange conditional on price data availability (details about data

description are provided in the Appendix). Although there is another internationally recognized weighting system⁵ (Turner and Van't Dack 1993, Edwards 1989, Lipschitz and McDonald 1991) taking into account domestic production of each trading partner (*double weights*), it is difficult to employ it for the period under study since output data for most countries including Bulgaria is either unavailable or unreliable. With respect to the method of aggregation, we apply geometric weighted average (instead of arithmetic average) in order to preserve the relationship between exchange rates quoted in national currencies per 1 unit of foreign currency and vice versa (Bozhkov, 2004). NEER is calculated according to the formula:

$$NEER = \prod_i \left[\frac{1}{ER_{BGL/X_i}} \right]^{w_i},$$

Where ER_{BGL/X_i} is the bilateral exchange rate of the BGL for one unit of foreign currency of country i , and w_i is the respective weight of i country in the foreign trade of Bulgaria.

Bulgarian nominal EER is calculated incorporating nine/eleven of its main trading partners (Austria-Hungary, divided into Austria, Hungary and Czechoslovakia after WW-I, Belgium, France, Germany, Italy, the Ottoman Empire/Turkey Switzerland, the UK and the USA), thus covering over 2/3 of Bulgaria's foreign trade – an average of 87.6 percent in the pre WW-I period and 81.6 percent for the interwar years. The share of all trading partners has been determined on yearly basis. Shorthand methods have recently been applied (Solomou and Catao, 2000, Shimazaki and Solomou, 2001. and Catao and Solomou, 2003) using several (either two or three) base years. In our understanding, however, the technique followed here is painstaking yet far more precise procedure for determining the foreign currencies that should be included in the basket. Moreover, this allows us to take simple averages for the respective countries' weights for the reference period which produces similar results to the Fisher ideal index applied by Shimazaki and Solomou (2001).

Real effective exchange rate is defined as nominal rate deflated by of foreign prices or costs relative to those at home. Applying the same geometric average procedure of aggregation, we calculate the REER in the following way:

$$REER = \prod_i \left[\frac{P^{BG}}{P^i * ER_{BGL/X_i}} \right]^{w_i},$$

⁵ Double weighting systems are applied by most international organizations like BIS, OECD, IMF, and European Commission.

Where P^{BG} is the price deflator in Bulgaria, P^i is the price deflator in the respective trading partner of Bulgaria and all other notations are the same like in the NEER formula.

Real EER was derived by using consumer price indicators where possible, as was the case for Austria, Belgium, France, Germany, Italy, Switzerland, the UK and the USA (Maddison 1991) and Bulgaria for the interwar period. Unfortunately, as the CPI was not available for Bulgaria prior WW-I and for Turkey for the whole period 1879-1939 we were forced to resort to other price indices (see Appendix). In the Bulgarian case, which is best known to us, the price index excluded the rent and clothing but included detailed information about food, drinks and heating (Statistical Yearbook of Bulgarian Kingdom, various years)⁶. For Turkey the price deflator is approximated by the cost-of living index for Istanbul only (Pamuk 2000). However, as Solomou and Catao (2000) point out, this should not cause any significant problems because of the 'high correlation between the GDP deflators and consumer price deflators'.

Finally, we should stress again that the aforementioned data problems make the REER calculated only indicative estimates of the general trends. The weights used are the same trade weights as were used in the nominal EER calculation.

2.2 Long-term perspective

Another methodological aspect of calculating effective exchange rates is to have a constant basket of currencies (Ellis 2001), i.e. it should include the same currencies (countries) over the whole period under review. For the sake of constructing a long-term historical time series of effective (nominal) exchange rates, we find ourselves constrained to form a basket of only 7 currencies identified by seven trading partners of Bulgaria – France, Germany, Italy, Switzerland, the UK, the USA and Turkey which together comprise up to 62% on average for the whole period (1879-1939). This methodological requirement restrained us to include Austria-Hungary and Belgium in the sample. After WW-I the former Hapsburg Empire was divided into several independent states (Austria, Hungary, Czechoslovakia, Poland and Yugoslavia) while for Belgium there is no exchange rate reported for the years 1915 to 1918 when it was under German occupation. The data for the two significant Bulgarian trading partners would later be reintegrated when focusing our research on the two key episodes (the Gold Standard and the postwar currency stabilization).

Provided the way EERs are constructed, upward movement should be interpreted as appreciation with respect to the base period which is 1913-1914 as the most commonly used one in the literature on the subject (Shimazaki and Solomou 2001) and downward movement as depreciation (figure 1).

⁶ For the period before 1887 we use market price index of food excluding meat.

Figure 1. Bulgaria's NEER (1879-1939, 1913/1914=100)



The long-term development of Bulgaria's nominal effective exchange rate starts with the establishing of the Bulgarian sovereignty when the Bulgarian Lev was fixed to the French Franc in a parity of 1 to 1. From its very beginning it is characterized by quite a stable behaviour experiencing slow depreciation towards the end of the Classical Gold Standard, which is also common for the other countries in the gold club 'core' and the 'periphery' after mid-1890s (Solomou and Catao 2003).

The decade of warfare (three consecutive wars: the First and Second Balkan Wars and the WW-I) triggered Bulgarian effective exchange rate depreciation in nominal terms. Hence, in 1921 it reached the trough at 46.1 percent of its original 1913 value. Within a single year (1923) the trend was completely reversed when Bulgaria's NEER appreciates by 197.3 percent. This in fact was due mainly to the devaluation of the Reichsmark and the significant German share of Bulgaria's visible trade (an average of 21 percent for the whole period). Although we do not pretend that NEER gives us the exact degree of appreciation and depreciation, one can find in Nenovsky and Dimitrova (2006, p. 10) that 'in June 1923 a sharp rise to 75 *stotinky*⁷ per US dollar was observed which recorded appreciation of the Bulgarian lev of 245 percent'.

⁷ 1 BGL is subdivided into 100 *stotinky*.

It was not before 1924 when Bulgaria, following some of the ‘core’ countries (like France) undertook measures for exchange rate stabilization. Unlike the UK Bulgaria fixed its national currency at a new devalued parity. The new parity of BGL established *de facto* in 1924 was 77 percent under its prewar level. Bulgaria’s poor gold reserves position⁸ and the heavy burden of its foreign debt service narrowed dramatically the room for maneuvers during the Great Depression leaving Bulgaria with virtually no choice but to defend its national currency (Ivanov 2004, Nenovsky and Dimitrova, 2007, Tooze and Ivanov, 2008).

This policy choice was translated in Bulgarian NEER as a monotonous appreciation after mid-1920s accompanied by Draconian measures for maintaining a stable exchange rate of the of the national currency. Following the German *Devisenbewirtschaftung* experience a combination of trade and foreign exchange restrictions were introduced in 1931. They helped the government to preserve, at least officially, the parity of BGL. It was not before 1933 when a system of exports subsidies was put in place, thus unofficially devaluating the Lev with approximately 25 percent (Nenovsky and Dimitrova, 2007). Officially, however, the peg against the gold was maintained until the end of the period in review.⁹

2.3 Short-term perspectives

The period in review (1879-1939) is characterized by turbulent episodes and severe disturbances of international trade and economic development, evidenced by the high volatility (standard deviation) of the shares (around the mean) designated to the respective trading partners of Bulgaria (Germany – 15.8, Turkey – 9.5, the UK – 7.6, Italy – 5.7). This implies different biases of the constructed long-term NEER for some years. As the effective exchange rates are very sensitive to changes in the trade structure and high inflationary currencies (Ellis 2001), we consider focusing the analysis in two sub-periods. Another

⁸ Apart from the external constraint on borrowing after WW-I, Bulgaria suffered from purely domestic constraints on capital accumulation like chasing the capital accumulation during WW-I upon the accusation of being “illegally acquired on the account of those who fought for Bulgaria” (article 4 from the Law of the national catastrophe), high tax burden on corporate profits and political instability (Boshulkov, 1927). For a recent review in the literature see Avramov (2007).

⁹ Actually, Bulgaria never devalued until the late 1940s. *De facto*, however, the Lev was subjected to an adjustment mechanism through the currency control, the export subsidies and the paper-exchange standard during the WW-II.

important motivation for our decision is the data break in 1913 or 1914¹⁰ in both Maddison and Statistical Yearbook of Bulgarian Kingdom price indices.

The huge structural changes in international trade and the periods of hyperinflation forced us to construct series for two unattached sub-periods. Their borders were defined in purely empirical manner influenced more by the data availability constraint, rather than following some theoretically justified criteria like Garofalo (2005).¹¹ For both periods we managed to construct economically consistent indicators of effective ERs, which in a broader framework characterize the two major exchange rate regimes, i.e. the Classical Gold Standard and the Gold-Exchange Standard between both world wars. Although we cannot directly compare values of effective exchange rates between the two periods, such analytical technique would allow us to study the sub-periods in more details as well as to allocate the general developments across them. Furthermore, dividing the long-term NEER trend into two short-term periods would enable us to include several important trade partners (Belgium and Austria-Hungary in the first sub-period as the latter one divides into Austria, Hungary and Czechoslovakia in the second sub-period) that were omitted so far due to data breaks.

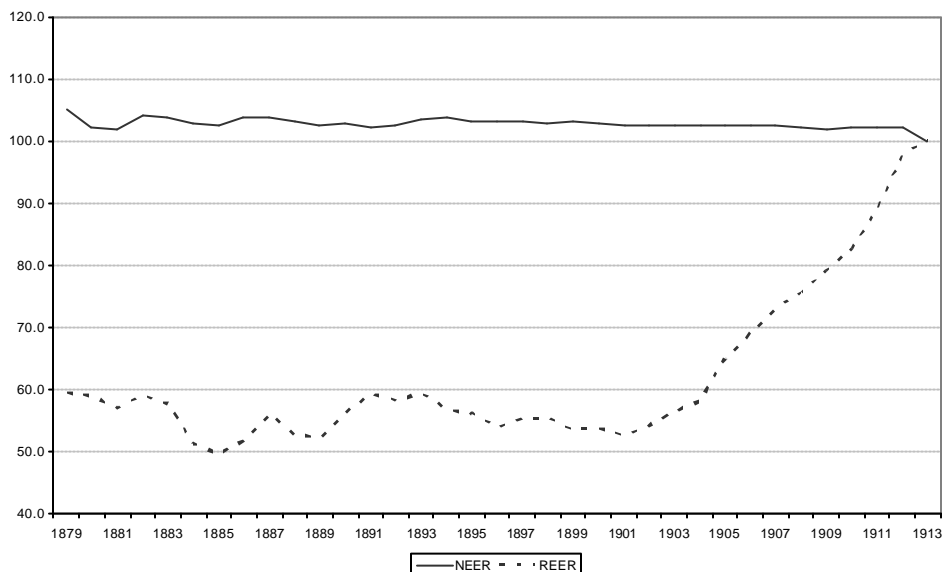
2.3.1 First sub-period (1879-1913)

The first period that stretches between 1879 and 1913 concurs with the period of the Classical Gold Standard with a base year in 1913. The effective exchange rate covers 9 countries with which Bulgaria conducted 88% of its foreign trade turnover. Among its main trading partners we managed to incorporate Turkey (20%), Austria-Hungary (18%), the UK (19%), Germany (11%) and Belgium (8%), France (7%), Italy (3%), Switzerland and the USA each with 1% of the total foreign trade turnover.

¹⁰ Maddison (1991) CPI data is divided into sub-periods with a break in 1913. The lack of overlapping observations for some countries prevented us from constructing a series for the whole period. Similarly, in the case of Bulgaria, we use one price indicator for the period prior 1913 and another for the period after.

¹¹ In Garofalo (2005) the author also employs an econometric approach for classifying exchange rate regimes which proves to cover the major episodes of exchange rate experience in Italy identified also according to the methodology for periodization applied in economic history.

Figure 2. Bulgaria's EERs (1879-1913, 1913=100)



Putting the EERs under the magnifying glass (figure 2) we can detect a close to 5 percent appreciation of the Lev in nominal terms in the late 19th century with respect to its 1913 level. The NEER exhibited larger volatility by 1897 when a ‘limping’ Gold Standard was functioning in Bulgaria (Avramov, 2006). From its very beginning a bimetallic system was introduced in the independent state which was different for the system implemented in LMU countries in two distinct features: (1) it allowed for other silver foreign coins to circulate within the country and (2) it did not set a limit on the silver coins in circulation (Nedelchev, 1940). In 1897 the monetary law was amended as a result of which the Bulgarian Lev, which obtained convertibility in 1891, was stabilized about 3 percent higher than its level in 1913. From 1897 the NEER gradually depreciated towards the end of the Classical Gold Standard.

Conversely, the REER was much depreciated since the introduction of the national currency starting from a very low price level of around 50 percent below its 1913 value. The REER of the Bulgarian Lev was quite volatile till the end of the 19th century reflecting the price dynamics of agrarian production. The drop of the Bulgaria’s REER in 1885 by around 8 percent and its reversal in the following year particularly was a result of price effects stemming from the close trade relations with Turkey (20 percent of Bulgaria’s foreign trade turnover). Since 1901, soon after the financial crisis throughout Europe, the REER of the Bulgarian Lev started to monotonously appreciate which was due to the

international environment rather than to a specific local factor (Eichengreen, 2002).

The degree of appreciation might be however slightly biased by our choice to use another (the only available) price indicator for Bulgaria, which can be described as something between CPI and retail price index from today's point of view¹². The index reported by the Bulgarian General Directorate of Statistics included 98 commodities mainly food, drinks and heating. According to the occasionally survived peasants' budgets from 1907 those items comprised nearly 2/3 of the rural consumption (about 80 percent of the population lived in villages). If clothing is also taken into consideration as far as the wool and goat-hair were widely used by the population in rural areas for self-making of garments, then the index coverage would reach 80 percent. Obviously, the rents were the only significant item excluded from the index. Unfortunately, official statistics does not report data on rents before 1911 preventing us from the calculation of CPI for Bulgaria during the years of the Classical Gold Standard.

2.3.2 Second sub-period (1927-1939)

The second time series is calculated for most of 1920s and 1930s with a base in 1929 (figure 3). In such a way we were able to exclude the WW-I and its devastating consequences and concentrate on the postwar stabilization of BGL. Interestingly, although the number of the currencies in the basket is larger (11 countries) due to the split of Austria-Hungary into several independent states, the Bulgaria's foreign trade coverage decreases to 81.6 percent on average¹³.

¹² Given the character of consumption and the degree of home production in the country at that time, we consider it representative for capturing consumer prices changes, and hence appropriate for a consistent international comparison.

¹³ This fact could be a result of the devastating consequences of the WWI as well as of the unstable economic situation in the interwar period, or it could also be interpreted in support of the role of single currency area for trade intensification.

Figure 3. Bulgaria's EERs (1927-1939, 1929=100)



As result of the devaluation of several key currencies in early 1930s Bulgarian NEER started to appreciate. When the sterling left the “gold club” in 1931 the Lev was overvalued by close to 26 percent with respect to its 1929 level. This was followed by another 2.4 percent appreciation in 1933 driven by the US departure of the gold. The intense trade relations with Germany in the interwar period, the specific bilateral trade agreements (clearing, exchange rate premiums and compensations¹⁴) as well as the collapse of Gold Block after Bank de France’s decision to go off gold in 1936 resulted in about 9 percent further appreciation of the Bulgarian currency.

The development of REER could be split into 3 sub-periods. Until 1929 when Bulgaria was on the upward curve of the economic cycle the REER continue to appreciate by another close to 5 percent from its level in 1927. This was mainly a result of the 7.5 percent 1927 Stabilisation Loan granted under the auspice of the League of Nations and the influx of foreign capitals that followed suit. The Great Depression put a sudden end to the short-lived gold inflows reversing the trend to a steep depreciation aggravated by the sharp slump in

¹⁴ For more details see Toshev (1943) and Svrakoff (1941).

agricultural prices. The trough was reached in 1935 when the REER of the Lev was 41 percent under its 1929 level. From mid-1930s onwards the national currency started gaining strength and by the 1939 it restored half of its value.

The post-1929 development of REER allows us to analyze the familiar devaluation/deflation dilemma that Bulgarian elite was facing during the Great Depression from an unfamiliar vantage point. Political considerations played an important role in determining its decision to stay on gold. It could be argued that co-operation with Bulgaria's former adversaries in the Entente was the cornerstone of the entire reconstruction effort in Bulgaria from as early as 1919 (Ivanov and Tooze, 2007). Certainly, there was no doubt in the mind of the People's Block governments that took control of Bulgaria from June 1931 that they should follow the line of international and domestic stabilization pursued since 1920s. Debt repudiation would have questioned this key policy dogma and should have certainly resulted into a deeper economic and political isolation. As the People's Bloc Prime Minister Nicola Mushanov (1931-1934) was to put it in 1933: "We are too weak to solve alone, with our own Dutch courage, the [economic] problems".¹⁵

As we shall see shortly (section III) this politically driven regime choice could also find an economic justification. With the autarkic drive at its extreme and the quantitative restrictions stifling the international trade in 1930s further REER depreciation would have hardly boosted Bulgarian export and improve its balance of payments.¹⁶

3. Relationships between REER and exports in Bulgaria

Further to the above discussion, here we propose an attempt to study export determinants and particularly the impact of REER and external demand on export development. Based on fundamental theoretical relationships real export should predominantly reflect REER movements and foreign demand (Krugman and Obstfeld, 2003)¹⁷. The relationship also known as the *volume effect* can be illustrated with the following formula:

$$X^* = f(REER, Y^*),$$

Where X^* as real export (volume of export) is a function of REER and Y^* is foreign demand. According to the method of REER calculations (upward movements indicate appreciation) real export is expected to be in reverse

¹⁵ Stenografski dnevnitsi na ? ? III ONS, 23 Nov. 1933, p. 231.

¹⁶ For more details on Bulgaria's choice on the devaluation-deflation dilemma in the interwar period see Nenovsky and Dimitrova (2007).

¹⁷ This is only the export-side effect of REER changes on the current account.

relationship with respect to REER development, i.e. to have a negative sign (referred below as negative impact), while real exports and external demand should exhibit developments in the same direction (Rivera-Batiz and Rivera-Batiz, 1985).

The indicator of the external demand (Y^*) is the real GDP growth of Bulgarian trading partners. As a proxy we take GDP aggregated for the core 12 European countries at 1990 international Geary-Khamis dollars (Maddison, 2003). Due to the lack of long-term historical series of export deflators of Bulgaria, M^* is approximated with total export deflated by the price of wheat on international markets¹⁸. Although the share of wheat in total Bulgaria's export is decreasing with the time starting from around 40 percent on average for the early period before 1914 and getting close to 10 percent in the interwar period, the choice of export deflator is justified by the fact that wheat is a major food commodity and traditional export product for underdeveloped countries like Bulgaria in the period under study.

Table 1. Bulgaria's exports, trading partners' income and REER

Period	Exports	Partners' income	REER
1879-1939	8.91	2.43	-0.73
1879-1913	8.09	2.34	1.66
1924-1939	10.75	2.63	-6.14

Note: Annual growth rates, percent.

Studying the annual growth rates of the indicators (tables 1) reveals that the period under the Classical Gold standard was characterized by real appreciation of the Bulgarian Lev (1.66 percent per annum on average), while it experienced depreciation (-6.14 percent) in real terms in the Interwar period. A brief look at the magnitude and sign of the averages suggest that the theoretical relation between real exports and external demand is likely to hold for all sub-period as well as throughout the whole period. Based on these summarized statistics we can expect that REER movements might influence real exports for the period under study as this effect might be bigger in the Interwar period. The average annual growth rates, however, provide us with point elasticities which cannot capture the process in dynamics.

¹⁸ Data is approximated by 'US Wholesale price of wheat, Chicago, Six Markets' from NBER Macrohistory Price Database: <http://www.nber.org/databases/macrohistory/contents/chapter04.html>

The impact of the REER and external demand on exports is further studied by econometric techniques. The estimation procedure includes preliminary unit root tests of the constructed time series and co-integration tests. These tests do not provide evidence of co-integration relationships among the variables¹⁹, so OLS regressions using stationary transformations of the variables have been applied on the basis of the following regression specification:

$$\ln(\text{Exports}_t) = \mathbf{b}_0 + \mathbf{b}_1 \cdot \ln(\text{REER}_t) + \mathbf{b}_2 \cdot \ln(\text{Foreign Income}_t) + \mathbf{u}_t,$$

where *Exports* is real exports, *Foreign Income* is the GDP of the core twelve European countries, *REER* stands respectively for the long-term and short-term real effective exchange rate in the presented Equations 1 and Equations 2, and *u* are the residuals. The main results from the estimation output have been presented in Table 1 below.

Table 1: Impact of REER and Foreign Income on Real Exports

Estimated impact of REER and foreign income on real exports				
Explained variable: real exports				
Equation 1			Equation 2	
Period/ Factors	REER (long term)	Foreign income	REER (short term)	Foreign income
1879 - 1939	-0.26	2.05	n.a.	n.a.
<i>t-statistic</i>	-4.00	8.20		
<i>Adj. R-squared</i>	0.6756			
1879-1913	n.a.	n.a.	-1.10	2.79
<i>t-statistic</i>			-2.87	7.07
<i>Adj. R-squared</i>			0.6796	
1923-1939	n.a.	n.a.	-0.02	2.79
<i>t-statistic</i>			-0.10	3.60
<i>Adj. R-squared</i>			0.5449	

For the whole period in review the long-term REER has a statistically significant negative impact on the volume of exports as initially expected: a per cent increase (appreciation) of the REER leads on average to 0.26 per cent decrease in the volume of exports²⁰. A significant positive impact of the foreign

¹⁹ For further information on time-series techniques, see Hamilton (1994), Hendry (1995), etc.

²⁰ The period from 1915 to 1922 is the period of the WW-I and the economic uncertainty until the stabilization efforts, and hence modeled as a dummy variable.

income is confirmed: a per cent increase in the external demand leads on average to 2.05 per cent increase in the volume of exports. (See Table 1, Equation 1)

The short-term REER and the volume of exports show statistically significant relation for the period 1879-1913, which relation suggests that during the Classical Gold Standard one percentage point appreciation in REER resulted in more than one percentage points increase in real export contraction. The estimation for the second short-term period of 1923-1939 shows that there is no significant relation between REER and the volume of exports.

In both sub-periods, however, there is a positive impact of the foreign income on the real exports: an increase of one percent in the foreign income leads on average to 2.79 per cent increase in the volume of exports. (See Table 1, Equation 2)²¹. Besides, it is also observed that for the two sub-periods the volume of exports fluctuates around some autonomous value, which could be interpreted as an autonomous real export or could be also biased by the applied export deflator.

4. Concluding remarks

Finally, we can summarise that the REER has an impact on the real exports for the whole period under study (1879-1939), and a particularly stronger effect for the first period from the establishment of the Bulgarian currency, the Lev, till 1913. Based on the results we may argue that under comparatively free international trade which characterized the Classical Gold Standard in Bulgaria (1879-1913), REER movements have statistically significant impact on exports in compliance with the theoretical postulates. The insignificance of the estimated effect of REER on export for the Interwar period could be explained by the collapse of the free international trade after WW-I and the quantitative restrictions introduced as a reaction to the Great Depression. In fact as a result of the hostile international trade environment, the observed REER depreciation did not contribute much to an increase in export. Moreover, in this line of reasoning, we could even argue that REER could have not been employed as an efficient instrument for export stimulation under conditions of trade restrictions.

This argument could be used with respect to the devaluation dilemma in the 1930's suggesting that no further REER depreciation would have boosted exports and thus improved the trade balance of Bulgaria. Furthermore, as shown in Nenovsky et al. (2007), even the allowed exchange premiums on limited

²¹ Although the estimated effect of the foreign demand on real exports seems to be equal in both sub-periods, the values start to differ from the third decimal point.

private foreign trade deals of Bulgarian exporters reaching 25% in nominal terms (which could be interpreted as the market determined exchange rate development of the Bulgarian Lev), translated into less than 6% in real terms; hence they could have a marginal effect on real exports if any.

According to our estimations the impact of the foreign income on exports is statistically significant for all sub-periods and for the whole period under study. The results state that one percentage point increase in external demand could bring more than 2 percentage points increase of exports in real terms. Besides, the impact of foreign income is twice as bigger as the effect of REER on real exports which implies higher sensitivity of exports developments in real terms with respect to the external demand. It is also altogether stable over the time which could be interpreted as its significance for real exports performance. Moreover, its high value of 2.79 in the Interwar period suggests that it is the foreign demand or free international trade which is the only factor driving exports at that time (Boshulkov, 1927).

To conclude, we found statistically significant and theoretically justifies impact of REER on the volume of exports provided that free international trade is the prevailing paradigm. During the late 19th century however, there was no debate on whether the country should reconsider its exchange rate policy sharing the virtues of the Classical Gold Standard and above all the stability of the exchange rate. Being a predominantly agrarian country, all exports performance was explained by the harvest.

Under imposed trade restrictions in the Interwar period, in the case of autarchy in its extreme, we were unable to establish a statistically significant relationship between the two variables. These findings provide us with economic arguments with respect to the devaluation dilemma in early 1930s supporting the political choice and all implemented policy instruments for officially maintaining the stable exchange rate (Tooze and Ivanov 2008; Nenovsky and Dimitrova, 2007).

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Appendix 1: Data Description

A. International trade weights.

Countries and their weights (simple average) for the respective period.

Period I. From 1882-1913: Austria-Hungary (18%), Belgium (8%), France (7%), Germany (11%), Italy (3%), Switzerland (1%), UK (19%), USA (1%) and Turkey (20%). Total coverage (88%).

Period II. From 1920-1935: Austria (9%), Hungary (2%), Czechoslovakia (6%), Belgium (4%), France (6%), Germany (25%), Italy (13%), Switzerland (3%), UK (7%), USA (2%) and Turkey (5%). Total coverage (82%).

Source: Bulgarian Statistical Yearbooks, various years.

B. Exchange rates

Period I.

From 1879-1887: Annual average exchange rates of the Bulgarian Lev are reconstructed using the official parity against the French Franc, bilateral exchange rates of the French Franc against various currencies and cross rates. Sources: www.eh.net.

From 1887-1893: Exchange rates were extracted from sporadic publications in daily and weekly press. It should be pointed out, that although the constructed series are not exactly annual averages, the stability of the exchange rates at that time allow us to use these proxies without losing consistency. Sources: Bulgarian daily and weekly newspapers, various publications and issues.

From 1893-1913: Annual average series is constructed averaging 12 monthly observations, as the latter are arithmetic averages of 4 weekly observations at a certain dates. Due to the lack of averages for some periods, we take the average of the buying and selling bilateral exchange rates (raw data). Source: State Gazette; daily and weekly press published in the period 1879-1897; Kioseva, 2000; Bulgarian Statistical Yearbooks; Izvestia na BNB.

BGL-USD exchange rate for the period from 1879-1914 is reconstructed by the means of cross rates between BGL-Pound Sterling exchange rate and USD-Pound Sterling exchange rate. The latter is taken from: <http://www.measuringworth.com/>

Period II: From 1914-1939: Annual average bilateral (selling) exchange rates. Just for the sake of consistency we compare overlapping values for 1914 and detected minor differences, which do not bias the general development of exchange rates. Due to the lack of bilateral exchange rates against the Hungarian national currencies before 1925, we reconstruct the series on the basis of correlation of 1 between the HUP and ATS (taken as first difference).

Source: Bulgarian Statistical Yearbooks, Izvestia na BNB.

C. Price data

All price data is CPI (1913/1914=100) from Maddison (1991) except those for Hungary, Czechoslovakia, Turkey and Bulgaria. The CPI value for 1920 for Belgium is reconstructed from Mitchell's cost-of-living indices (1992) as the time series overlap almost completely for the rest of the period.

Hungary: cost-of-living index 1929=100 (Mitchell, 1992).

Czechoslovakia: cost-of-living index 1929=100 (Mitchell, 1992)

Turkey: cost-of-living index for Istanbul 1914=100 (Pamuk 2000).

Bulgaria: For the period 1879-1886 – index of price change of vegetable products only (market prices); whenever data is not available (1879, 1880, 1883, 1884, 1885), it is approximated by the change of the price index of Turkey. Source: Statistical Yearbook of the Kingdom of Bulgaria, various issues.

For the period 1887-1913 - index number of the price change of 98 goods; studying this indicator it represents something between CPI and retail price index. Given the character of consumption and the degree of home production at that time, we consider it representative for capturing consumer prices changes, and hence appropriate for a consistent international comparison.

For the period 1924-1938 – cost-of-living index (food, electricity and heating for 12 major cities in the Kingdom of Bulgaria (1914=100). The same one is quoted in Mitchell (1992).