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Effective Exchange Rates in Bulgaria 1897–1939[1]

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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 Catão (2000, p. 372) 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 so far omitted when the operation of the Gold Standard and the interwar gold-exchange standard were in review.

Our main purpose is to construct nominal and real effective exchange rates of the 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-East Europe Monetary History Network (SEEMHN)

[1] Acknowledgements to: Ivaylo Nikolov (Loughborough University, UK) for providing us with Maddison data on CPI, Svetla Vladimitova (BNB librarian), who helped us with the data collection, and Matthias Morys (Oxford University) for providing us with price data for Austria-Hungary. We are also grateful for comments received by Roumen Avramov (Centre for Liberal strategies-Sofia).

Data Collection Project[2]. 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 to the best of our knowledge.

The current paper is divided into 3 parts. The main body of research is presented in the second part, which 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 between 1897 and 1913 and 1927 and 1939. In the last part of the article we use standard econometric techniques to study some export's determinants and particularly the impact of the Real Effective Exchange Rate (REER) and external demand on exports' 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 and sources is presented in the Appendix.

2. Effective Exchange Rates for Bulgaria

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.

Bilateral exchange rates of the Bulgarian lev against foreign currencies are available from Feb. 1897,[3] which determined the beginning of the period in review of the paper. The exchange rate data was collected from the Exchange Rate Section in the State Gazette. Normally, the BNB reported the rate 3 to 4 times a week of which we used one observation 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 exchange rate as a simple average of these four observations. From the information reported in the newspaper we used only the rate of bills of exchange, as this was the way most of the trade was financed, thus leaving the ER for banknotes and coins aside. Then, using a simple average

[2] The South-Eastern European Monetary History Network was initiated in 2006 by the central banks of Albania, Austria, Bulgaria, Croatia, Greece, Romania, Serbia, Slovenia and Turkey.

[3] Bulgarian National Bank (BNB) was established in 1879. In 1885 it was granted monopoly on banknote issue. Few years later in 1891 Bulgarian gold and silver backed banknotes gained convertibility.

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 system[4] (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 the 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 vise 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 LEV 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.

The Bulgarian nominal EER is calculated incorporating eight/ten of its main trading partners (Austria-Hungary, divided into Austria and Hungary after the First World War, Belgium, France, Germany, Italy, the Ottoman Empire/Turkey Switzerland, the UK and the USA), thus covering over 2/3 of Bulgaria's commercial exchange – an average of 87.5% in the pre First Word War-period and 77% for the interwar years. The share of all trading partners has been determined on a yearly basis. Shorthand methods have recently been applied (Solomou and Catão 2000; Shimazaki and Solomou, 2001 and Catão 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.

Real effective exchange rate is defined as the 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:

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

[4] 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.

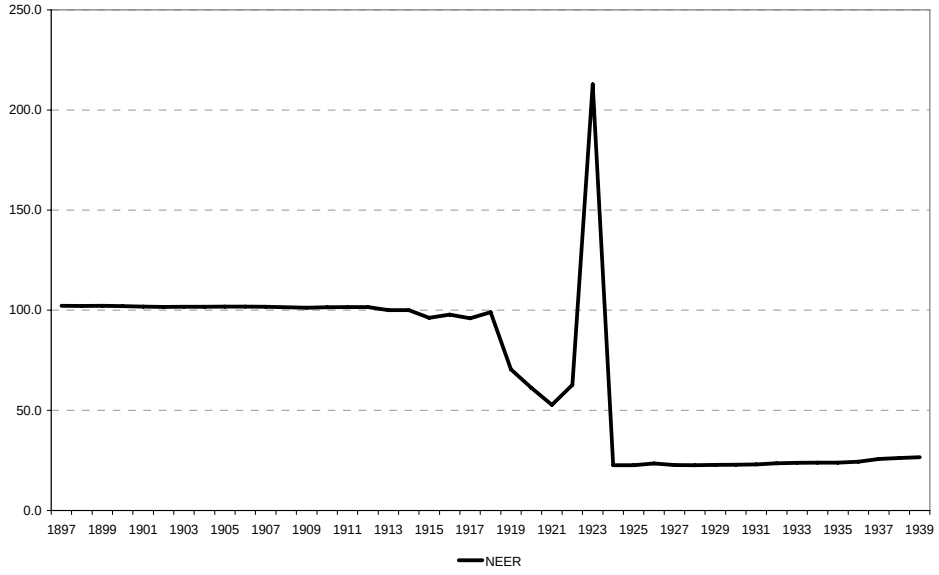
Real EER was derived by using consumer price indicators where possible, as was the case for Austria, Belgium, France, Germany, Italy, Switzerland and the UK (Maddison 1991) and Bulgaria for the interwar period. Unfortunately, as the (Consumer Price Index) CPI was not available for Bulgaria prior to the First World War and for Turkey for the whole period 1897–1939 we were forced to resort to the wholesale price index (Pamuk 2000, Statistical Yearbook of Bulgarian Kingdom, various years). However, as Solomou and Catão 2000 point out, this should not cause any significant problems because of the *high correlation between the GDP deflators and consumer price deflators*. In the Bulgarian case, which is best known to us, this consumer price index excluded the rent and clothing but included detailed information about food, drinks and heating. However, 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 6 currencies identified by six trading partners of Bulgaria – France, Germany, Italy, Switzerland, the United Kingdom and Turkey which together comprise up to 60% on average for the whole period (1897–1939). This methodological requirement restrained us to include Austria-Hungary and Belgium in the sample. After the First World War 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 as the most commonly used one in the literature on the subject (Shimazaki and Solomou 2001) and the historical data bases (Maddison 1991, Mitchell 1992) and downward movement as depreciation (chart 1).

Chart 1: Bulgaria's NEER (1897–1938, 1913/1914=100)



Source: Authors' calculations.

The long-term development of Bulgaria's nominal effective exchange rate seems to experience slow depreciation towards the end of the Classical Gold Standard, which is common for the other countries in the gold club *core* and the *periphery* after mid-1890s (Solomou and Catão, 2003). The decade of warfare (three consecutive wars: the First and Second Balkan and the First Word War) triggered Bulgarian effective exchange rate depreciation. In 1919, it reached the trough at 47.37% of its original 1913 value . Within a single year (1923) the trend was completely reversed when Bulgaria's Nominal Effective Exchange Rate (NEER) appreciates by a factor of 24. 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 24% 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*[5] per US dollar was observed which recorded appreciation of 245 percent".

It was not before 1924 when Bulgaria, following some of the *core* countries (like France) undertook measures for exchange rate stabilization. Unlike the U.K. Bulgaria fixed its national currency at a new devalued parity. The new parity of the

[5] According to the law from 1885 1 lev was subdivided into 100 *stotinky*.

lev established *de facto* in 1924 was 77 percent under its prewar level. Bulgaria's poor gold reserves position[6] and the heavy burden of its foreign debt service narrowed dramatically the room for maneuvers during the Great Depression leaving Sofia with virtually no choice but to defend its national currency (Ivanov 2004, Nenosky et al, 2007).

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 *Devisenbewirschaftung* 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 the lev. It was not before 1933 when a system of export subsidies was put in place, thus unofficially devaluating the lev with approximately 25 percent. Officially, however, the peg against the gold was maintained until the end of the period in review.[7]

2.3 Short-term Perspectives

The period in review (1897–1939) is characterized by turbulent episodes and severe disturbances in the 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 – 15.4, Turkey – 8.2, the UK – 6.1, Italy – 5.9) and of the coverage of the basket itself (7.5). 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 important motivation for such our decision is the data break in 1913 or 1914[8] in both Maddison and the Statistical Yearbook of Bulgarian Kingdom price indices. Last but not least, in that way we would be able to make a comparison in-between the two time spans without losing consistency.

[6] 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 for Putting on Trial the Culrpits for the National Catastrophy), high tax burden on corporate profits and political instability (Boshulkov, 1927). For a recent review in the literature cf. Avramov, 2007.

[7] 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 Second World War.

[8] Maddison (1991) CPI data is divided into sub-periods with a break in 1913. The luck 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.

The huge structural changes in international trade and 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).[9] For both periods we managed to construct economically consistent indicators of effective ERs, which more or less 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 allow us to include several important trade partners (the USA, Belgium, Austria and Hungary) that were omitted so far due to data breaks.

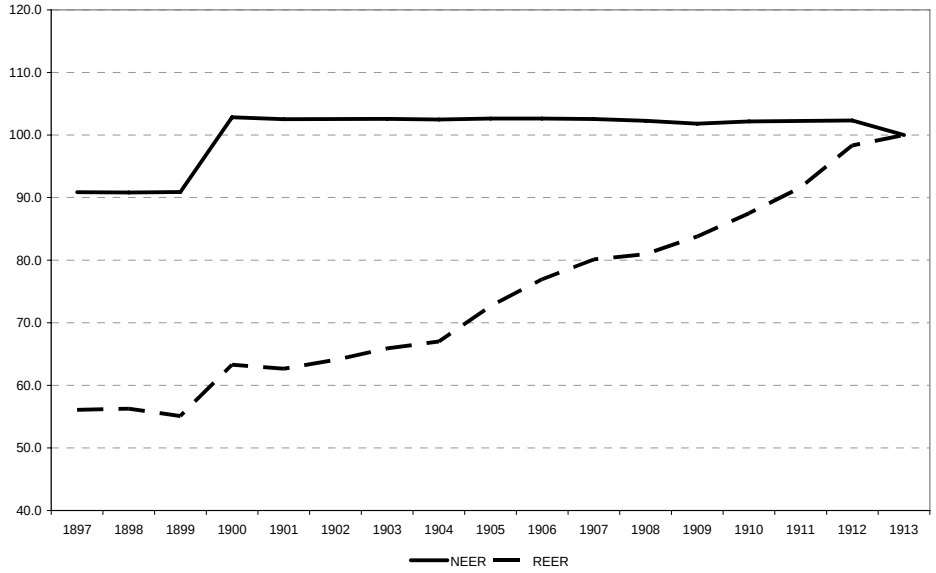
2.3.1 First Sub-Period (1897–1913)

The first period stretches between 1897 (the first year for which we were able to get detailed exchange rate data) and 1913, as the latter serves as a base year. In international context it covers the final stage of the Classical Gold Standard. The effective exchange rate covers eight countries with which Bulgaria conducted 88% of its foreign trade turnover[10]. Among its main trading partners we managed to incorporate Turkey (18%), Austria-Hungary (18%), the UK (16%), Germany (14%) and Belgium (10%).

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

[10] In contrast to ERRs calculated as ideal Fischer ideal index (Solomous and Catão, 2000), the trade shares in our calculations are average values of the respective periods.

Chart 2: Bulgaria's EERs (1897–1913, 1913=100)



Source: Authors' calculations.

Putting the EERs under the magnifying glass (chart 2) we can detect in the late 19th century a close to 10 percent depreciation of the lev in nominal terms with respect to its 1913 level. In 1900, however, the NEER exhibited a sharp appreciation of 13.2 percent, triggered by the weakened Austria-Hungarian Crown (Eichengreen, 2002). Investigating bilateral exchange rates of the lev it turned out that the crisis affected most Austria-Hungary from all of the Bulgarian trading partners in EER basket. From the 1900 peak NEER marginally depreciated by 2.5 percent on average till end of the Classical Gold Standard. Conversely, the REER was appreciating throughout the whole period starting from a very competitive (low) price level.

The degree of appreciation might be however slightly biased by our choice to use another (the only available) price indicator for Bulgaria, which might be described as something between CPI and retail price index from today's point of view[11]. The index reported by 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

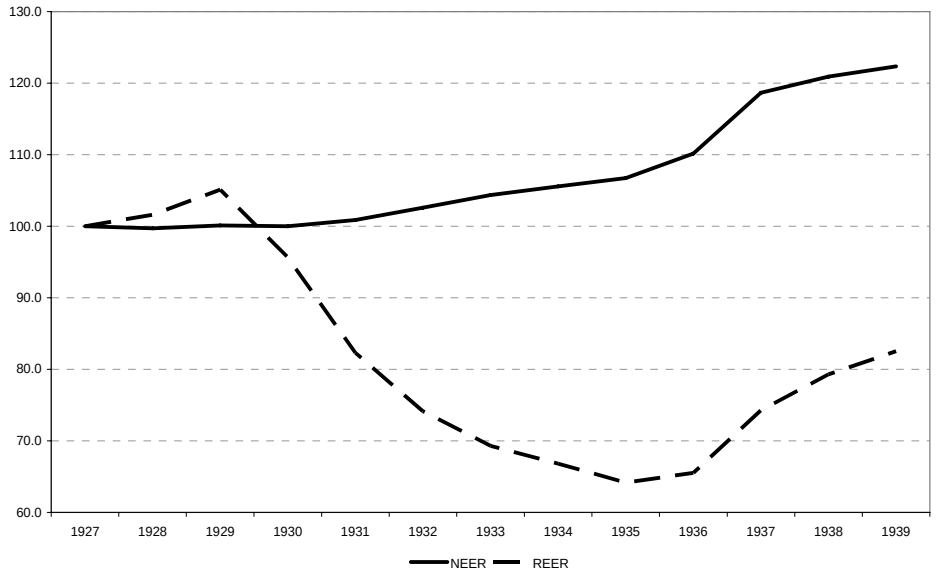
[11] Given the character of consumption and the degree of home production in the country at that time, we consider it representative for capturing consumer prices changes, and hence appropriate for a consistent international comparison.

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-preparation 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 1927 (chart 3). In such a way we were able to exclude the First World War and its devastating consequences and concentrate on the postwar stabilization of the lev. Interestingly, although the number of the currencies in the basket is bigger (10 countries), Bulgaria's foreign trade coverage decreases (by an average of 75 percent). The number of main foreign trade partners increased after WW-I due to the split of Austria-Hungary into several independent states and the inclusion of the USA.

Chart 3: Bulgaria's EERs (1927–1939, 1927=100)



Source: Authors' calculations.

As a 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 2 percent with respect to its 1927 level. This was followed by another 2.5 percent appreciation in 1933 driven by the U.S. departure of the gold. The intense trade relations with Germany, the specific bilateral trade agreements (clearing, exchange rate premiums and compensations[12]) as well as the collapse of the Gold block after the Banque de France's decision to go off gold in 1936 resulted in 7 percent further appreciation of the Bulgarian currency.

The REER development 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 agricultural prices. The trough was reached in 1935 when the REER of the lev was 35 percent under its 1927 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. (Tooze and Ivanov, 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."*[13]

As we shall see shortly (section 3) this politically driven regime choice surprisingly did not come at a high economic price. With the autarkic drive at its extreme and the quantitive restrictions stifling the international trade in 1930s further REER depreciation would have hardly boosted Bulgarian export and stabilized its balance of payments.

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

[12] For more details see Toshev (1941–42) and Svrakov, (1941).
[13] Stenografski dnevnitsi na XXIII ONS, 23 Nov. 1933, p. 231.

development. Based on fundamental textbook theoretical relationships real export should predominantly reflect REER movements and foreign demand (Rivera-Batiz and Rivera-Batiz, 1985). The relationship can be illustrated with the following formula:

$$M^* = M^*(REER, Y^*),$$

Where M^* as real export (volume of export) is determined by 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 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.

An indicator of the external demand (Y^*) is the real GDP growth of Bulgarian trading partners. As a proxy we take GDP per capita 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 by the physical volume of export (thousands of tones). Anticipating that this might have some biases on the estimates, we also investigate the impact of both factors on nominal export, i.e. total amount of export incorporating price changes.

The impact of the long-term REER on the exports is studied for the whole period – from 1896 to 1939, while the impact of the short-term REER is analyzed for the two sub-periods 1896-1913 and 1923-1939. The estimation procedure includes preliminary unit root tests of the constructed time series and cointegration tests. These tests do not provide evidence of co-integration relationships among the variables we consider, so less advanced techniques than VAR or VEC, like OLS regressions using stationary transformations of the variables have been applied. An attempt to differentiate the impact of the REER on the nominal and real exports is made through the use of respectively the volume of exports as a proxy variable for the real exports (table 1) and exports in current leva (table 2).

For the whole period in review the long-term REER has a statistically significant, although of small size (0.08) negative impact on the volume of exports (as initially expected). The analysis for the period shows a significant negative impact on the volume of exports of the period 1915–1920 (modeled as a dummy variable), which can be explained by the war and post-WWI economic slow-down.

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

Models	Equation 1 (log of exports)		Equation 2 (log of exports)		Equation 3 (1st diff of log)	
Period/ Factors	REER (log)	Foreign income (1st diff of log)	REER_ST (1st diff of log)	Foreign income (1st diff of log)	REER_ST (1st diff of log)	Foreign income (1st diff of log)
1896 - 1939	**-0.088824**	1.318458	-	-	-	-
t-statistic	-2.321326	0.414798	-	-	-	-
R-squared		0.734064	-	-	-	-
1896-1913	-	-	**-2.058866**	2.127893	-	-
t-statistic	-	-	-4.22638	0.986926	-	-
R-squared	-	-		0.54875	-	-
1923-1939	-	-	-	-	0.127352	-0.816524
t-statistic	-	-	-	-	0.484371	-0.641216
R-squared	-	-	-	-		0.582457

Source: Authors' estimations.

It should also be noted that short-term REER and the volume of exports show significant relation for the period 1896–1913 which suggest that during the Classical Gold Standard one percentage point REER appreciation resulted in more than 2 percentage points in real export contraction. The estimation for the second short-term period of 1923–1939 leads to a conclusion that neither the REER nor the foreign income has a significant influence. The volume of exports however, fluctuates around some autonomous value, which could be interpreted as an autonomous real export or could be also biased by the characteristics of the indicator (physical volume in tones). Moreover, it shows significant deviations in the years of 1930/31 and 1936 as a result of some idiosyncratic factors. The extraordinary increase in the of real export in 1930/31 is motivated by the good harvest given that the Bulgarian export is dominated by agricultural products, while the comparatively high increase in 1936 could be explained by the intensifies trade with Germany as a result of the overwhelming clearing agreement and the strong war orientated demand of this country. The foreign income has no statistically significant impact of the volume of export both in the analysis of the whole period and in the analysis of the two sub-periods.

Table 2:Impact of REER and Foreign Income on Exports in Current Leva

Models	Equation 1 (log of exports)		Equation 2 (1st diff of log)		Equation 3 (1st diff of log)	
Period/ Factors	REER (log)	Foreign income (1st diff of log)	REER_ST (1st diff of log)	Foreign income (1st diff of log)	REER_ST (1st diff of log)	Foreign income (1st diff of log)
1896 - 1939	-0.001379	0.791589	-	-	-	-
t-statistic	-0.083405	0.916792	-	-	-	-
R-squared		0.303735	-	-	-	-
1896-1913	-	-	**-3.406283**	-	-	-
t-statistic	-	-	**3.02794**	-	-	-
R-squared	-	-		0.825413	-	-
1923-1939	-	-	-	-	-0.013754	**3.634461**
t-statistic	-	-	-	-	-0.764486	**2.757762**
R-squared	-	-	-	-		0.474177

Source: Authors' estimations.

As we mentioned above, given the characteristics of real export, we would like further to investigate the relationship between export and REER daring to break the economic dichotomy between the nominal and real terms. From all regressions, total export is explained to a certain extent by the REER only for the short-term based variable for the period 1896–1913. Given the exhibited REER appreciation for the whole period, one percentage point of REER appreciation is associated with 3.4 percentage point decrease in nominal export. In the other two cases (the long-term REER for the whole period and the short-term REER for the period 1923–1939) the impact of the REER is statistically insignificant. However, in the second sub-period a significant positive influence of the foreign income is observed.

4. Concluding Remarks

Finally, we can summarize that the REER has a negative impact on the real exports, and a negative impact on the nominal exports of the period 1896–1913. Based on the results we may argue that under comparatively free international trade which characterized the Classical Gold Standard (1896–1913), REER movements have statistically significant impact on export in compliance with the theoretical postulates. The insignificancy and even the opposite theoretical impact of REER on export for the interwar period could be explained by the collapse of the free international trade after the First World War and the quantitive 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 to an increase in export. Moreover, in this line of reasoning, we could even argue that REER could not be 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 1930s suggesting that no further REER depreciation would have improved the trade balance of Bulgaria on the export side. Furthermore, as shown in (Nenovsky, Pavanelli and Dimitrova, 2007), even the allowed exchange premiums on limited 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 which could have a marginal effect on real exports if any.

According to our estimations the impact of the foreign income on exports is not statistically significant except in the case of nominal exports for the period 1923–1939 when one percentage point in foreign income could bring 3.6 percentage points in export. This further suggests that it is the foreign demand or free international trade which dominated the REER effect on export in the interwar period.

To conclude, we found statistically significant and theoretically justified impact of REER on the volume of export provided that free international trade is the prevailing paradigm. Under imposed trade restrictions, in the case of autarchy in its extreme, we were unable to establish a statistically significant relationship between REER and exports. These findings provide us with economic arguments with respect to the devaluation dilemma in the interwar period supporting the political choice and all implemented policy instruments for officially maintaining the stable exchange rate.

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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 1897–1913: Austria-Hungary (18%), Belgium (10%), France (7%), Germany (14%), Italy (4%), Switzerland (1%), UK (16%) and Turkey (18%). Total coverage (88%), standard deviation: 4.1.
Period II. From 1922–1936: Austria (9%), Hungary (2%), Belgium (4%), France (6%), Germany (28%), Italy (11%), Switzerland (3%), UK (6%), USA(2%) and Turkey (3%). Total coverage (75%), standard deviation: 4.4.
Source: Bulgarian Statistical Yearbooks, various years.

B. Exchange rates
Period I. From 1897–1913: 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; Bulgarian Statistical Yearbooks; Izvestia na BNB.

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 the one for Austria-Hungary, Hungary, 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.

Austria-Hungary: wholesale price index 1914=100 (generously provided by Dr. Matthias Morys).

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

Turkey: cost-of-living index for Istanbul 1914=100 (Pamuk 2000).
Bulgaria: for the period 1987–1913 – 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).

Appendix 2: EERs Data Series

Year	NEER Index (1913/1914=100)	REER index (1913/1914=100)	NEER Index (1913=100 and 1927=100)	REER Index (1913=100 and 1927=100)
1897	102.2	67.8	90.9	56.1
1898	102.1	68.0	90.8	56.3
1899	102.2	66.5	90.9	55.1
1900	102.0	66.6	102.9	63.3
1901	101.8	65.6	102.5	62.6
1902	101.6	66.9	102.6	64.1
1903	101.7	69.0	102.6	65.9
1904	101.7	70.6	102.5	67.0
1905	101.8	75.5	102.6	72.6
1906	101.8	79.2	102.7	76.9
1907	101.7	81.6	102.6	80.1
1908	101.5	82.8	102.3	81.0
1909	101.3	85.8	101.8	83.8
1910	101.5	89.1	102.2	87.5
1911	101.5	92.3	102.3	91.6
1912	101.5	98.2	102.3	98.3
1913	**100.0**	**100.0**	**100.0**	**100.0**
1914	**100.0**	**100.0**		
1915	96.2	119.9		
1916	97.8	198.1		
1917	95.9	363.8		
1918	99.0	724.6		
1919	70.5	712.9		
1920	61.2	1032.4		
1921	52.7	937.1		
1922	62.7	2336.3		
1923	212.8	1123113.9		
1924	22.6	289.5	288.3	258.3
1925	22.6	272.4	175.5	146.1
1926	23.5	309.1	185.3	174.3
1927	22.7	307.6	**100.0**	**100.0**
1928	22.6	311.0	99.7	101.6
1929	22.8	321.1	100.1	105.1
1930	22.8	296.4	100.0	95.6
1931	23.0	264.5	100.9	82.3
1932	23.6	245.8	102.6	74.1
1933	23.8	231.2	104.4	69.3
1934	23.9	223.4	105.6	66.8
1935	23.9	213.3	106.7	64.2
1936	24.4	215.5	110.2	65.5
1937	25.7	236.5	118.7	74.3
1938	26.2	250.5	120.9	79.3
1939	26.6	261.0	122.3	82.5