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Income Shocks to Trade Balance under the Gold Standard

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Abstract: *»Einkommensschock für die Handelsbilanz unter Goldstandard«*. This paper investigates the major sources of changes in the trade balance of seven European countries – Denmark, France, Great Britain, Germany, Italy, Norway, and Sweden – before the World War I using the structural vector autoregression analysis. The results suggest that the transitory shocks to income are the main source of variation in the trade balance, whereas the permanent shocks to income determine the changes in the income.

Keywords: Trade balance, transitory and permanent shocks, gold standard.

1. Introduction

The intertemporal trade is measured by the current account of the balance of payments. Current account represents national savings or borrowings vis-à-vis the rest of the world and as such it is an outcome of intertemporal choices of households, firms and governments. There are two competing hypotheses in the intertemporal theory of the trade balance.

Using a model incorporating permanent income theory of consumption, Sachs (1981) shows that transitory and permanent shocks to income have different effects on the trade balance, under the assumption that the consumers' rate time of preference and the world interest rate are equal. Within this model, an increase in permanent income does not affect the trade balance because income and consumption increase by the same proportion. On the other hand, a transitory increase in income leads to an improvement in the trade balance if the increase is induced by the aggregate demand and to a deterioration of the trade balance if the increase is induced by an aggregate supply. The negative correlation between the trade balance and real income over the business cycle is taken as an evidence for the dominance of demand shocks.

Real business cycle models challenge Sachs and argue that real supply shocks can explain both long-term growth in income and cyclical variations in income and the trade balance (see Mendoza 1991; Razin 1993; Glick and Rogoff 1995). Here, the countercyclical behavior of the trade balance can be compatible with permanent productivity shocks, and not necessarily with the

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demand disturbances. The model is extended by the claim that demand shocks, such as changes in fiscal or monetary policy, are unable to explain the countercyclicality of the trade balance (Cardia 1991).

Using long-run historical data, which span from the last third of the nineteenth century to 1992, Kim (1998) examines the response of trade balance to demand and supply shocks in the United States, United Kingdom, Australia, Canada and Sweden. He concludes that the trade balance is explained mostly by shocks that cause transitory changes in income. The countercyclical behavior of the trade balance seems to be a robust feature in the U.K. and Canada but not in the smaller economies of Australia and Sweden. The evidence of the empirical studies for the post-World-War II period is mixed. The prevalence of the trade balance response to the transitory disturbances to income was documented for four industrialized countries by Kim (1996), for five European economies by Miljkovic *et al.* (2000) and for Visegrad Four and Baltic countries by Veselkova and Horvath (2008). Hoffman (2001) and Kano (2003) document that the current account fluctuations are explained predominantly by the country-specific transitory shocks. Lee and Chinn (2006) suggest that with the exceptions of the United States, temporary shocks play a larger role in explaining the variation in the current account of the G-7 countries. On the contrary, Hossain (1999) concludes that permanent component of income has statistically insignificant long-run effects on U.S. current account balance, whereas these effects are statistically significant in Japan.

The main aim of this paper is to implement the intertemporal considerations on the pre-World War I data of seven European countries: Denmark, France, Great Britain, Germany, Italy, Norway and Sweden. The emphasis is on the income effects and thus only permanent and transitory income shocks to the trade balance are considered. The results suggest that the transitory income shocks are responsible for most of the variation in the trade balance. On the other hand, permanent shocks are the main driving force of income but have little significant effects on the trade balance.

The rest of the paper is organized as follows. Section 2 discusses the potential demand and supply shocks and the adjustment mechanism under the gold standard. The methodology and the results are presented in section 3. The final section concludes.

2. Demand and Supply Shocks under Gold Standard

The classic gold standard as an internationally recognized monetary regime emerged in 1870 and lasted until the outbreak of the Word War I. Great Britain was on a full legal gold standard from 1860 and on a *de facto* gold standard since 1717, when Isaac Newton, as master of the mint, did not sufficiently lower the price of overvalued gold, which drove the undervalued silver coins out of circulation – an illustration of Gresham's law. Germany adopted the gold

standard in 1871, following the unification. Italy and France adopted the gold standard in 1873, following the creation of the Latin Monetary Union together with Belgium and Switzerland. Finally, Denmark and Sweden went on gold in 1873 upon the establishment of Scandinavian monetary union. Norway joined in 1875.

Different monetary regimes impose different restrictions on the ability of monetary authorities to influence the real economic variables as a result of the inevitable choice of two out of three desired goals of international monetary system. These are known as a "trilemma" or "impossible trinity" and imply tradeoff among exchange rate stability, independent monetary policy and free capital mobility (see Mundell 1961a, 1961b, 1962). During the gold standard countries enjoyed the stability of (mostly) fixed exchange rates and the benefits of free capital flows at the cost of independent monetary policy.

There are two competing explanations of the macroeconomic adjustment after the shock occurs in capital, money or commodity markets (for an overview of the literature, see Bordo 1984 or Eichengreen 1989). According to the conventional model of gold standard, the macroeconomic adjustment occurs through the working of the price-specie-flow model of David Hume. Assume two countries with the circulation of gold only. If a country runs the trade deficit, it means that it imports more goods than it exports. The gold flows to the other country as a payment for the imported goods. As a result, less gold circulates in the country, which drives the prices down, and lowers the demand for the foreign products. The country with the trade surplus experiences the opposite. Thus, balance of payments disequilibria are self-equilibrating through the change in the relative prices. The adjustment predicted by the price-specie-flow mechanism is sluggish due to lags between gold flows, changes in monetary base and the resulting changes in price.

A competing modern approach to the gold standard assumes internationally integrated goods and capital markets (see Niehans 1978; Barro 1979; McCallum 1989; McCloskey and Zecher, 1976; Calomiris and Hubbard 1987; Dick and Floyd 1992). Here, the price level is determined by the interactions between the money market and the commodity market: demand and supply conditions in the commodity market determine the real price of gold and, given the fixed nominal price of gold, the price level is determined by the demand and supply for the monetary stocks (Bordo 1999, 29). As the prices and interest rates maintain levels consistent with foreign interest rates and prices in the short run, the modern approach predicts a relatively fast adjustment to shocks.

The empirical evidence on adjustment-related outcomes under the gold standard points out to inconsistencies with the price-specie-flow mechanism. First, the simple price-specie-flow-mechanism predicts an inverse correlation in the price levels of two countries on the gold standard. However, McCloskey and Zecher (1976) found positive correlations, i.e. arbitrage, equally high between regions as between nations for internationally traded commodities and a

significant correlation of wholesale price indices between the United States and the United Kingdom. Second, the actual flows of gold in the late nineteenth century appear to be too small to play the large role assigned to them (ibid, 187). This does not have to be counterevidence to the price-specie flow mechanism. If central banks adjusted domestic credit in the same direction as changes in their foreign reserves (in other words, if they played by the rules of the game), the need for actual gold movements would be minimized. Small movements of gold would serve as a mere signal for central banks to expand or contract their economies. In case of a deficit, the central bank would increase an interest rate and deflate the economy, this way speeding up the adjustment. However, many scholars argue against the image of central bankers as automatons which followed rules oriented around external adjustment (Bloomfield 1959; Whale 1953; Pippenger 1984; Dutton 1984; Ford 1962; Jonung 1984; McGouldrick 1984). Quite the contrary, the central banks often tried to negate the impact of inflows or outflows of gold and foreign exchange on the domestic money supply.

The different assumptions of the competing approaches to the gold standard have to be taken into account in the discussion of the aggregate demand-aggregate supply framework, which is the methodological point of departure of this paper. Within the AD/AS framework, the aggregate demand is downward sloping in price-output space, reflecting that lower prices raise real money balances and therefore demand. The short-run aggregate supply is upward sloping, reflecting the short-run variations in capacity utilization in response to changes in aggregate demand. The long-run aggregate supply is vertical because capacity utilization returns to its normal level, preventing demand shocks from permanently affecting the production level. Solely temporary effects of demand shocks on output are used as the main identifying restriction in the model below. An open economy is thus exposed to two types of macroeconomic disturbances: demand shocks and supply shocks. Examples of demand shocks include monetary shocks or fiscal policy changes. Examples of supply shocks include a favorable technology shock that permanently raises potential output or a reduction in the supply of output due to natural disasters.

The main difference between two approaches to gold standard is related to the monetary shocks. The differences in assumptions have implications on the ability of the monetary authorities to influence the real money supply (see Calomiris and Hubbard, 1987). In order for the monetary authority to be able to influence the aggregate money supply and interest rates, it is necessary to assume inelastic gold supply and sticky commodity prices. This view is consistent with the price-specie-flow mechanism. On the other hand, the modern approach predicts a very limited ability of the central bank to influence the aggregate money supply or the rates of return on internationally traded securities. Under the assumption of a highly elastic gold supply and internationally

integrated capital and commodity markets, these are given by the international economy.

Shocks to the supply of or demand for monetary gold derive from two sources: gold production and shifts between monetary and non-monetary holdings (see Bordo 1999, 29-31). Most of the supply shocks to world's gold (but also silver) markets originated in the United States, e.g. gold discovery in Coloma, California in 1848. However, there were significant gold discoveries also in other continents, e.g. in Australia near Bathurst in 1851, in South Africa in 1884 or in Klondike, Canada in 1897. The gold discoveries in California in 1848 and Australia in 1851 brought about a tenfold increase in world gold production (Eichengreen 1996, 13). A similar effect was gained by the invention of the cyanide process in the 1880s, which permitted the extraction of gold from lower-quality ores.

The adjustment of the shocks is self-equilibrating. In case of an increase in the supply of gold, additional gold results in an increased price level. Given the fixed nominal price of gold, the real price falls and this way reduces profits and production in the gold mining sector and encourages a shift from monetary to non-monetary gold (Bordo 1999, 30). The reversal in the amount of monetary gold restores the equilibrium.

The adjustment of the shocks to demand for gold works in a similar way. The deflationary effects of an increase in productivity in the nongold sector of the economy or an increase in the number of countries on gold are offset by gold production and shifts from non-monetary to monetary gold holdings in response to the rise in the real price of gold.

Fiscal shocks are another textbook example of demand shocks. When the government increases its expenditures, individuals borrow abroad to spread the burden of higher taxes today and shift part of it to the future. As a result, the country runs a current account deficit today and the current account surplus in the future (Obstfeld and Rogoff 1996, chapter 1). Larger effects of temporary – especially war-time – government spending changes on the trade deficit than permanent ones was documented for Great Britain (Ahmed 1986, 1987). Similarly, Barro (1987) argues that bulk of budget deficits for Great Britain from the early 1700s through WWI was associated with temporary changes in military spending. He found only two major non-war deficits – one associated with compensation payments to slaveowners in 1835-36 and the other with a dispute over the income tax in 1909-10. Thus, a typical example of the fiscal shock is an increase in the British government purchases during the Boer War from 1899 to 1902 (Kaminsky and Klein 1994, 8).

The significance of wartime periods for the temporary components of shocks to government purchases is associated with the very nature of war. War is expected to be temporary. It creates a scarcity of goods for private, nonwar consumption today relative to the amounts in the postwar future. As individuals try to smooth their consumption over time, they lower their savings at every

interest rate. The current account deteriorates. Opposite is true for the peace country. This was observed during the World War I. Europe, led by Great Britain, liquidated major part of its assets abroad and borrowed heavily. On the other hand, the war accelerated the transition of the United States from a net debtor to a major creditor nation.

A textbook example of the supply shock is a favorable technology shock. A technological improvement increases the level of total factor productivity (TFP). This stimulates investment, which depends positively on the marginal product of capital, and leads to a rising path for output. Thus, the new technology works as a positive supply shock, which shifts the long-run supply curve to the right, equilibrating in the point of higher output and lower prices.

The period under study coincided with the industrial revolution, a supply-side phenomenon. A traditional view asserts that the industrial revolution brought a radical transformation of the economy and the society (Ashton 1971 and Landes 1969). This broad view of the industrial revolution is challenged by Crafts and Harley, who estimate modest rates of output growth during the industrial revolution and argue that the industrial revolution was a narrower phenomenon, as the result of a technological change in few industries – textiles, iron and transportation (Crafts 1985, Crafts and Harley 1992, 2000). Below, I briefly discuss the technological change in iron and transportation.

An example of the positive supply side shock is the Bessemer process, the first inexpensive industrial process for the mass-production of steel from molten pig iron. It began to be taken up by steel manufacturers on a large scale ten to fifteen years after its invention in 1865 (Flinn 1955, 85). The cheap steel enabled the fast development of the steel-utilizing industries, such as railroads, shipbuilding, and in the twentieth century automobiles.

Railway transportation replaced the canals in shifting bulk staples of low density at low costs and the long-distance coaches in rapid communication for people and specialized freights, such as mail, samples of goods and gold by 1850s (Mathias 2001, 252). Despite these advantages, there is a debate on the contribution of railways to the economic growth. Whereas Schumpeter (1949) and Rostow (1960, Chapter 4) argue that railroads were build ahead of the demand and were the leading sector of economic growth, the works of Fishlow (1965, Chapter IV) and Fogel (1964) counter their arguments through estimates of the social savings of the railroad, demonstrating that had there been no railways, the economic growth would have been postponed only for two years. However, the social savings measure is static and ignores the spillover effects to other industries. Venables and Gasiorek (1998) suggest that the welfare implications of the transport improvements are as much as 50 percent greater than the traditional transport benefits. Using a different approach alternative to the social savings, Crafts, Mills and Mulatu (2007) argue that there was a slowdown in TFP growth Britain's railways between 1850 and 1870s, after which it stabilized at about 1.1%.

Supply shocks may have also transitory effects on output. A classic example of a temporary negative supply shock is a failed agricultural harvest. As households attempt to smooth the effects of a poor harvest on current consumption, the demand for short-term loanable funds will increase and cause the short-term interest rates to rise (see Denslow and Rush 1989 for the study of the nineteenth century French data).

The above discussion focused on the potential demand and supply shocks during the gold standard. The basic concepts used in the analysis were introduced in a non-technical manner. The next section presents the methodology. As already discussed in the introduction, there are two competing intertemporal models of trade balance, which predict a different response of the trade balance to permanent and transitory shocks. The permanent and transitory components are isolated by Blanchard and Quah (1989) procedure, where shocks with a permanent impact on output are interpreted as supply disturbances and shocks with only a temporary impact on output as demand disturbances.

3. Data, Methodology and Results

This study examines how transitory and permanent components in income (Y) affect the trade balance (TB) of the seven European countries before the World War I. Income is measured as a natural log of real GDP or GNP. Trade balance is measured as a ratio of net exports to GDP in order to control for scale effects and to allow. Using the trade balance as a ratio to GDP reflects the saving and investment propensities of the economy and empirical results can be interpreted in line with intertemporal models. The data is obtained from Mitchell (1976). The end period of the yearly data is 1913. The beginning period varies according to the data availability as follows: 1850 for France and Great Britain, 1861 for Italy and Sweden, 1865 for Norway, 1870 for Denmark and 1880 for Germany. The periods roughly correspond with the periods, during which the countries were on the gold standard.

I rely on the model proposed by Kim (1996), where permanent and transitory shocks to income and their effect on the trade balance are characterized by equation (1).

$$X_t = \mu + \sum_{k=0}^{\infty} G_k U_{t-k} \qquad (1)$$

$X_t = (\Delta y_t, \Delta b_t)'$ and $U_t = (u^p_t, u^t_t)'$

where y_t is the real income and b_t is the trade balance expressed as a ratio to income. Δ denotes the first difference operator, μ is a vector of deterministic components and G_k's are matrices of coefficients. u^p_t denotes the structural

shock generating permanent changes in income and u^t_t denotes the structural shock generating transitory changes in income.

The transitory and permanent components in income are isolated using the Blanchard and Quah (1989) methodology, where the long-run identifying restriction is defined as a zero effect of a transitory shock on real income. Blanchard and Quah (1989) interpret these disturbances in terms of the textbook aggregate supply/aggregate demand (AS/AD) model where a vertical long-run aggregate supply curve implies that permanent shocks to output are caused by supply disturbances and aggregate demand shocks have temporary effects on output. Examples of demand disturbances would thus include changes in monetary or fiscal policy or autonomous changes in consumption. Examples of supply disturbances might include technological improvements or oil price shocks.

The Blanchard-Quah methodology requires stationarity (Enders 1995, 332). Augmented Dickey-Fuller test for unit roots was employed to determine whether the measures of income and trade balance have unit roots (available upon request). I was unable to reject the presence of a unit root for the income and trade balance data for all the series. Two exceptions were the trade balance series of Denmark and France. In the former, the presence of the unit root was not rejected only in the case of no trend and intercept, in the latter it was not rejected only in the case of trend and intercept. Based on these results, all GDP and trade balance series are considered to be integrated of order one. In order to determine the lag order, I consider various lag order selection criteria, such as the lag exclusion Wald tests, Lagrange multiplier test for serial correlation in residuals and residual normality test. Lag length 1 was indicated for all the countries except of Germany. In case of Germany, standard lag length criteria indicated the lag length 0. However, lag 0 would not allow to proceed with the analysis. Therefore, lag length 1 was chosen – similar preference of lag length 1 to 0 can be found in Keating and Nye (1998) and their analysis of permanent and transitory shocks in real output in the nineteenth century. Therefore, I use 1 lag in estimation for all the countries.

The results of the variance decomposition are reported in Table 1. Column *Y-P* shows the proportion of the variance in real income explained by permanent shocks to income. Column *TB-T* shows the proportion of the variance in trade balance explained by transitory shocks to income. I provide for each variable only the percentage of variance explained by one of the shocks because the two sum to 100%. Years ahead denote the number of steps in years. These results show that major portion of the variance in real income is explained by permanent shocks. Within 2-year horizon, permanent changes in income account for approximately 95% of variation in the real income of these countries. The exceptions are France, where permanent changes account for more than 85% of variation in the real income, and Italy, where they account for less than 60% of the variation.

Table 1: Variance Decomposition

Country	Years ahead	Y-P	TB-T
Denmark	1	98.17 (0.0290)	98.51 (0.0397)
	2	95.54 (0.0299)	98.62 (0.0434)
	4	95.16 (0.0300)	98.68 (0.0445)
	10	95.14 (0.0300)	98.68 (0.0445)
France	1	94.94 (0.0466)	99.37 (0.0142)
	2	86.31 (0.0517)	96.17 (0.0146)
	4	84.64 (0.0523)	95.05 (0.0147)
	10	84.64 (0.0523)	95.05 (0.0147)
Great Britain	1	99.96 (0.0289)	99.46 (0.0118)
	2	99.91 (0.0290)	96.56 (0.0120)
	4	99.91 (0.0290)	96.52 (0.0120)
	10	99.91 (0.0290)	96.52 (0.0120)
Germany	1	98.30 (0.0287)	94.81 (0.0096)
	2	95.65 (0.0292)	94.48 (0.0098)
	4	95.43 (0.0292)	94.45 (0.0098)
	10	95.43 (0.0292)	94.45 (0.0098)
Italy	1	84.36 (0.0291)	49.93 (0.0106)
	2	58.03 (0.0351)	49.99 (0.0108)
	4	49.92 (0.0381)	50.00 (0.0108)
	10	49.33 (0.0383)	50.00 (0.0108)
Norway	1	99.74 (0.0183)	99.21 (0.0164)
	2	99.54 (0.0191)	88.24 (0.0181)
	4	99.54 (0.0192)	88.22 (0.0182)
	10	99.54 (0.0192)	88.22 (0.0182)
Sweden	1	97.75 (0.0452)	99.73 (0.0150)
	2	94.17 (0.0492)	91.39 (0.0157)
	4	93.62 (0.0496)	89.96 (0.0158)
	10	93.62 (0.0496)	89.96 (0.0159)

Notes: Column Y-P shows the proportion of the variance in real income explained by permanent shocks to income. Column T-B shows the proportion of the variance in trade balance explained by transitory shocks to income. Numbers in parentheses refer to one standard error.

The column TB-T shows important finding of the paper: the major portion of the variance in trade balance is explained by transitory shocks to income. Within 2-year horizon, transitory changes account for 98.62 % movements in the Danish trade balance, 96.17 % in the French, 96.56 % in the British, 94.48

% in the German, 88.24 % in the Norwegian, and 91.39 % in the Swedish trade balance. The single exception is Italy, where the transitory changes to income explain approximately 50% of the variation in its trade balance.

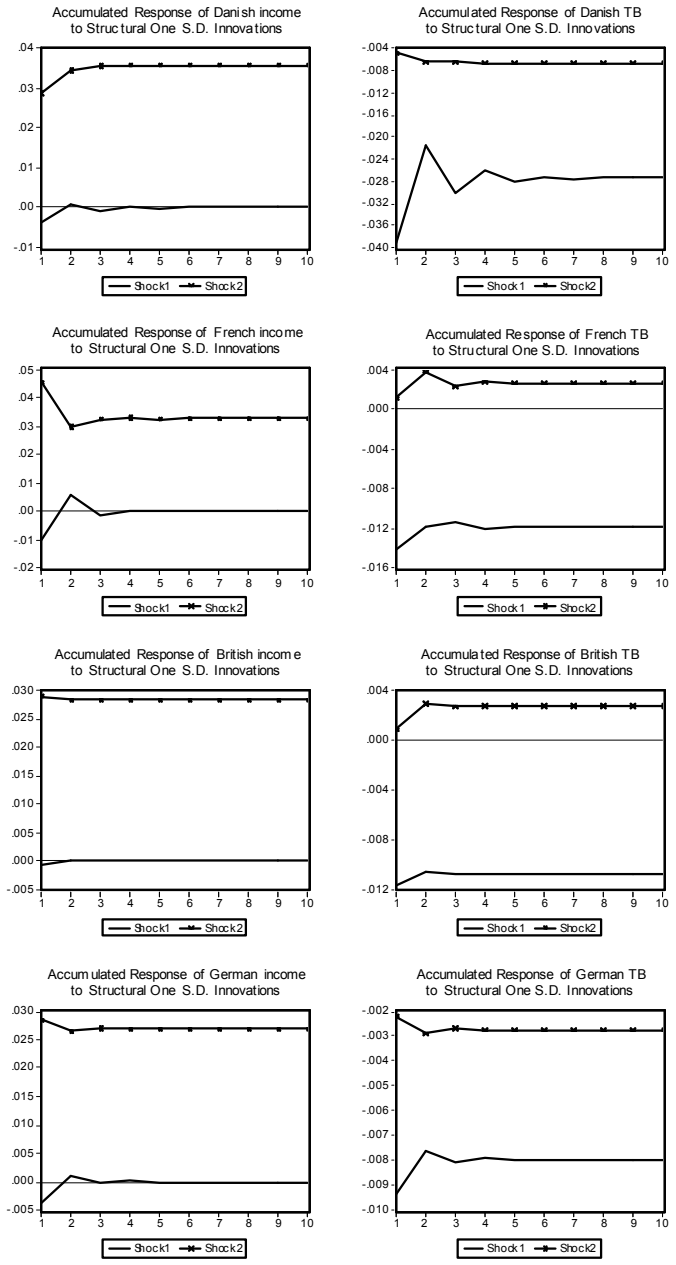
Figure 1 plots the accumulated responses of income and trade to structural one standard deviation innovations. Figures for each country are organized in pairs. The left figure plots the impulse response function of the real income to shock 1 (shock with temporary effect on income) and to shock 2 (shock with permanent effect on income). The right side figure plots the impulse response function of the trade balance to the shock 1 (temporary) and the shock 2 (permanent).

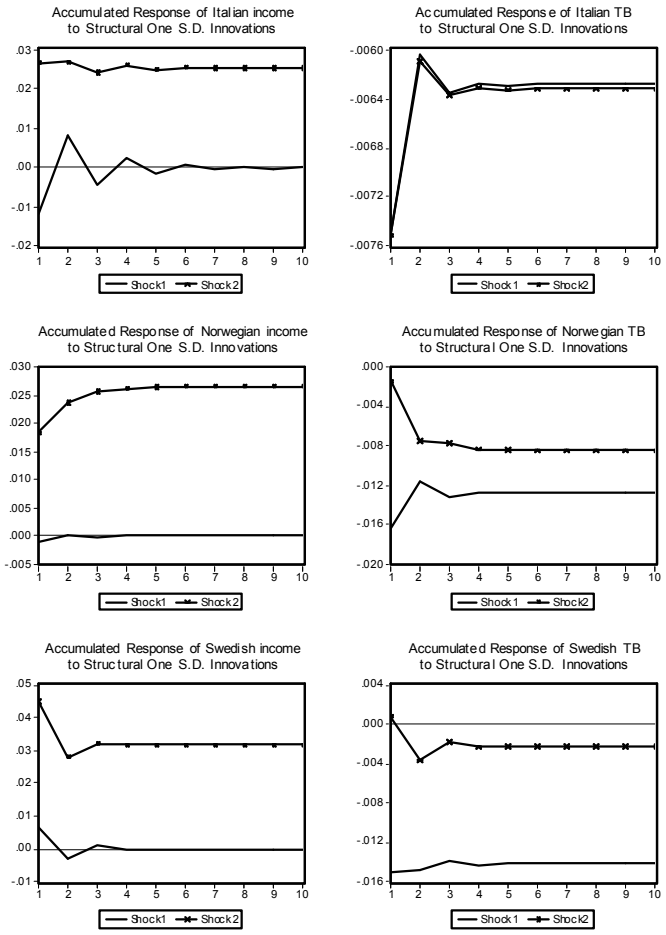
A permanent shock increases the income permanently in all the countries. A transitory shock has mixed effects. In the case of Denmark, Great Britain and Norway, it increases the income. In case of France and Germany, it initially reduces the income but in the second year the effect changes and the transitory shock increases the income. In case of Italy and Sweden, there is a fluctuation in the effects of the transitory shock. In case of Sweden, the transitory shock initially increases the income. An increase is followed by a reduction in the second year and a further increase in the third year, before the effects die out. The fluctuation is even more profound in case of Italy. By the identification assumptions, the transitory shock has no long-term effect on the income. Thus, the effects of the transitory shock die out after few years.

On the trade balance, a transitory shock reduces the trade balance in all cases. The effects of permanent shocks are more diverse. In case of Denmark, Germany, Italy and Norway, the trade balance decreases with the permanent shock, whereas it increases in France and Great Britain. In Sweden, an increase is followed by the decrease in the second year.

The puzzling finding is the lack of evidence on the countercyclical relationship between income and the trade balance. In the previous historical studies, the positive correlation was observed for Sweden 1869-1991 by Kim (1998) and 1871-1986 by Vredin and Warne (1991). In this study, there is a positive correlation in case of Denmark, Great Britain and Norway. The relationship is not clear in case of other countries due to fluctuations in the response of income to the transitory shock. Furthermore, the positive relationship of income and the trade balance in case of Great Britain is contrary to the results of Kim (1998). This may be due to a slight difference in the methodology or a difference in time spans. Whereas this paper covers the period of 1850-1913, Kim (1998) examines a longer period of 1870-1992, which covers also the Bretton Woods period and the post-Bretton-Woods period of free float.

Figure 1: Impulse Responses





The positive correlation between the income and trade balance is addressed in three ways. First, the response of the trade balance to a temporary change in income is different depending on the source of the change. It is assumed to deteriorate (improve), if it is due to a demand (supply) shock (Sachs 1981). Thus, the positive correlation of the trade balance and temporary changes in income may point out to the prevalence of the temporary supply shocks, such as failed harvests, in explaining temporary changes in income. Second, as Kim (1998, 590) points out, small open economies are subject to more external shocks, which tend to cause income and the trade balance to move in the same direction. Finally, the correlation between the income and the trade balance is questioned by real business cycle research. For example, Baxter (1995) sug-

gests that demand shocks such as change in government spending or taxes can also induce a positive correlation between income and the trade balance. In that case, the only conclusion to be drawn from the above analysis is the importance of temporary shocks to income in determining the trade balance movements.

4. Conclusions

The main findings of this paper suggest that factors determining the changes in the trade balance are different from those determining changes in the long-run income. These findings are consistent with the Sachs' (1981) intertemporal model of trade balance and are in line with the findings of Hoffman (2001), Kano (2003), Kim (1996, 1998), Miljkovic *et al.* (2000) and Veselkova and Horvath (2008).

The results of this paper support the view that the changes in the trade balance are associated with the transitory shocks to income. In the aggregate demand/aggregate supply framework, these are identified as the demand shocks or temporary supply shocks. The potential demand shocks in the nineteenth century are the shocks to demand and supply of gold. Significant gold discoveries or the invention of the cyanide process for extraction of gold from low-grade ores worked as monetary expansion. On the other hand, an increase in the number of countries on gold worked as a monetary contraction, leading to deflationary pressures. The fiscal shocks were related mostly to an increased government spending during the military conflicts. A typical example of the temporary supply shock is a failed harvest.

Second, the results of this paper suggest that the changes in the income are associated with the permanents shocks to income. The income grew in response to the permanent shock to income in all the countries. This is hardly surprising as the period under study coincided with the industrial revolution. Examples of the positive supply side shocks thus include technological improvements in the production of iron, improvements in transportation, manufacturing or communication.

In contrast to most of the previous studies, the results suggest the positive correlation between the income and trade balance in case of Denmark, Great Britain and Norway. The positive correlation may be due to the differences in times spans (gold standard period vs. longer time spans reaching to the post-Bretton-Woods period) or slight differences in the methodology. Within the traditional intertemporal model, the positive correlation points out to the relative importance of the temporary supply shocks over demand shocks. Alternatively, Baxter (1995) argues that the demand shocks can also induce a positive correlation between income and the trade balance. Therefore, the further research should focus on models, which can differentiate various sources of transitory income shocks.

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