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A note on Italy's current account sustainability: 1861-2010

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Abstract

By using an original dataset, this paper analyzes the sustainability of Italy's current accounts over the years 1861-2010. We find empirical support to sustainability: the Italian economy used external deficits (surpluses) to smooth aggregate consumption. Persistent current account deficits from 1861 to WW1 seem to have been used to prompt the nation's productivity and economic efficiency and so they do not seem to have undermined the nation's intertemporal solvency.

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1. Introduction

The sustainability of current account (CA) has been receiving increasing attention because it represents an indicator of a country's economic performance. The sustainability of an external deficit in the long run is related to the solvency constraint of the economy. An economy is solvent in the long run when its present-value budget constraint holds, i.e., if the country can borrow to finance this deficit (Milesi-Ferretti and Razin 1996).

A well-known approach to deal with this issue is due to Thirlwall (1979). According to this view the balance of payments (BOP) acts as a constraint on GDP growth. This view assumes that exports are totally exogenous, determined by core country demand for the nation's products, while imports are a function of the nation's GDP. In this scenario, the CA balance is highly sensitive to the domestic rate of growth; if the rate exceeds some threshold level, the balance would be plunged into deficit. In the short run, this deficit can be financed by selling reserves or by importing capital. However, the only effective solution to a persistent CA deficit is a lower rate of growth.

In recent years, this Keynesian view has been superseded by the intertemporal approach to the CA. In this perspective, the CA derives from savings and investment decisions that are based on intertemporal considerations. The CA is an intertemporal phenomenon which smoothes the time profile of consumption in the face of shocks to output, investment, or government expenditures (Obstfeld and Rogoff 1995). According to this view, when current income deviates from its permanent level the economy finds optimal to borrow and lend in international markets in order to smooth consumption fluctuations. This generates CA deficits and surpluses. Such CA fluctuations respond to preferences for current over future consumption and viceversa and act as a buffer against shocks to economic fundamentals. Thus, in this optimization framework, CA deficits should not require policy intervention and do not necessarily curb economic growth. Attention must be paid to the sustainability of the external deficit, which depends on the economic structure of the country involved (i.e., the degree of openness, the levels of savings and investment, the health of the financial system), the composition of the CA balance and how deficits are financed (Milesi-Ferretti and Razin 1996). Thus, an ongoing CA deficit in a rapidly growing economy may be an indication that investment and growth are not unduly constrained by domestic saving capacity, facilitating the country's convergence to steady state levels of output and capital intensity. In this latter case, there is no reason why a prolonged CA deficit should constrain economic growth as it prompts capital accumulation, increased efficiency in the use of production factors and higher total factor productivity that generate additional export revenues, thereby enhancing intertemporal solvency (Sachs 1981).

Most of the empirical literature on CA focused on either developed countries, especially the high and growing US CA deficit (Trehan and Walsh 1991; Wu 2000; Edwards 2006; Chen 2011a) or developing countries (Kim et al. 2009; Bracke et al. 2010; Donoso and Martin 2013; Chen 2011b), over relatively short time spans, generally starting from the 1960s. By contrast, the analysis of the external imbalances in a long run perspective has attracted much less attention (Taylor 2002; Corbin 2004). The long run perspective is instead important because an economy may depart for several years from the long run steady state CA path even though external debt can be sustainable.

The aim of this paper is to contribute to fill this gap by analysing the sustainability of Italy's CA in the long run, from its political Unification in 1861 to 2010. We think Italy is a good case study because it is a late-comer which caught up with industrialization in the late 19th century and then exhibited an excellent economic performance that enabled it to join the G-7 group in the 1970s. By focusing on a long time span of about 140 years, we analyse the sustainability of Italy's CA position across different stages of development, i.e., in the earlier

stage when Italy was a developing economy and also in a later stage when it had become a developed economy.

By using an original dataset, this paper analyses Italy's CA sustainability by studying the statistical properties of the CA to GDP series. Non stationary behaviour of the CA implies that the country has violated its intertemporal budget constraint. As demonstrated by Trehan and Walsh (1991), the stationarity of the CA to GDP series is a sufficient condition for the intertemporal budget constraint to hold. Broadly speaking, stationarity is possible whether external deficits (or surpluses) are not too persistent over time.

Using integration, cointegration and Granger causation analysis we find the following results. CA to GDP series is stationary over the years 1861-2010, that is, the Italian economy satisfies its intertemporal external constraint in the long run by using the external deficits to smooth domestic consumption. Hence, these deficits were sustainable and did not slow down economic growth. However, we also find that this result is not robust for the shorter 1861-1913 sub-period, when Italy was still a developing economy. By contrast, stationarity is confirmed for the later 1929-2010 and 1948-2010 sub-periods, i.e., when Italy had become a developed economy. We test whether CA deficits in the 1861-1913 years constrained economic growth by analysing the genesis of CA fluctuations, that is, whether the latter were generated by the dynamics of the GDP or by variations in capital inflows. The Granger causality supports for the second hypothesis. Italy's persistent CA deficits from Unification to WW1 seem to have been used to prompt the nation's productivity and economic efficiency and so they do not seem to have undermined the nation's intertemporal solvency.

The remainder of this paper is structured as follows. Section 2 describes our sources and data. Section 3 presents a theoretical model that implies a long run equilibrium between imports and exports and sets the statistical condition for the sustainability of the external deficits. This section also presents an econometric strategy to test the genesis of CA fluctuations in the years 1861-1913 and whether they constrained economic growth. Lastly, section 4 concludes.

2. Sources and data

Taylor (2002) and Corbin (2004) included Italy in their comparative analysis of the CA to GDP ratios in a sub-sample of Oecd countries from mid-19th century to the end of the 20th century. These authors rely on the same dataset which – for the years 1861-1959 – uses the CA series produced by the Italian national statistical office (Istat 1957, 1986), while for the years from 1960 onwards it relies on the data provided by the Bank of Italy in the version published by World Bank (1994).

However, several objections were raised against the Istat CA series. Istat seems to have significantly overestimated the earnings of services, and especially of tourism. But, above all, Istat emigrants' remittances seem excessively variable. In fact, these estimates appear to be based on the gross *flow* of migrants, whereas remittances seem more reasonably tied to the savings by the *stock* of Italians abroad (Fenoaltea 2011). To tackle such criticism, Morys (2006) presented a new and more reliable series of Italy's BOP for the period 1868-1913. For the 1919-1931 years, a new series of Italy's BOP, which revised the Istat one, was presented by Falco (1995).

As to the GDP series, Taylor (2002) and Corbin (2004) rely on the so-called Istat-Fuà series, in the version published by Mitchell (1992). These estimates date back to the series that were originally presented by Istat (1957). However, this work lacked key series, details on methodology and sources, and an appropriate degree of skepticism about official statistical sources (Cohen and Federico 2001). These series were only partially improved by a team of scholars led by the economist Giorgio Fuà (Ercolani, 1969; Fuà, 1965, 1969; Vitali, 1969).

Yet, the Fuà team did not attempt to rebuild the core of the work by Istat: the estimates of value added at current prices.
It was only on occasion of the 150th anniversary of Italy's unification, celebrated in 2011, that the Bank of Italy presented a reconstruction of the national accounts, complete in both the production and expenditure sides, for the whole 150 years since unification (Baffigi 2011).
In this paper, we test the stationarity of Italy's CA to GDP ratio in the years 1861-2010 by using a new dataset which, for the CA, uses the Istat (1957) series for the years 1861-1867, 1914-1918, and 1932-46, the Morys (2006) series for the years 1868-1913, the Falco (1995) series for the years 1919-1931, and the Bank of Italy's series for the years from 1947 to 2010. The latter are taken from Masera (1970) and Banca d'Italia (2008, 2010) and the *Annuario Statistico Italiano* (Italy's statistical yearbook, 2001-2010). For the GDP, we use the new series that have been provided by the Bank of Italy for the 150th anniversary of the nation's political unification (Baffigi 2011).
As anticipated in the Introduction, we also present an econometric strategy to test whether persistent CA deficits in the 1861-1913 sub-period constrained economic growth. On this purpose, following Fenoaltea (2011) we use his real rent series as a proxy of the Italian lira's real exchange rate and data on net capital stock in machinery and equipment drawn from Broadberry, Giordano and Zollino (2011).

3. Testing the sustainability of CA unbalances

Empirical literature focuses on the implication of the sustainability of CA unbalances (Hakkio and Rush 1991; Husted 1992; Gundlach and Sinn 1992). From the simple model of intertemporal budget constraint, Husted (1992) derives the following testable model

$$\boldsymbol{Exp}_t = \alpha + \beta\, \boldsymbol{Im}\, \boldsymbol{p}_t + \varepsilon_t$$

where Exp and Imp are, respectively, the GDP's ratio of the exports of goods and services and the imports of goods and services plus net interest payments and net transfer payments. Hence, we define the CA balance as a ratio to GDP as CA/GDP = (Exp – Imp). As showed by Trehan and Walsh (1991), the statistical stationarity of the CA series is a *sufficient* condition for the intertemporal budget constraint to hold. In terms of equation above, this implies a strong long run relationship between Exp and Imp, that is it requires $\beta = 1$ and ε_t stationary. In other words, this condition requires the stationarity of the CA/GDP.
Now we perform unit root tests to determine the univariate properties of the Italian CA/GDP. Table 1 summarizes the final outcomes for the ADF (OLS/GLS) and KPSS tests. For the whole period 1861-2010, we strongly reject the hypothesis of non stationarity in the ADF tests, while we accept the null of stationarity in the KPSS tests[1]: Italy's CA to GDP ratio is stationary, that is its deviations from the long run equilibrium due to exogenous shocks to imports and/or exports are only temporary. Hence, in the long run the Italian intertemporal budget constraint holds.[2] However, the nation's solvency may not hold in the short run, that is over shorter time spans. The stationarity is confirmed for the 1929-2010 and 1948-2010 sub-periods, whereas in the 1861-1913 years CA/GDP is not stationary due to persistent deficits in the 1860s, in the 1880s and in the five years prior to WW1.

[1] The null of the ADF tests is non stationary series (unit root), while the null of the KPSS is stationary series. Hence, if both reject their nulls then we have no confirmation, but if test ADF rejects the null but test KPSS does not (or viceversa) we have confirmation. The detailed results for these tests are available on request.
[2] Margani and Ricciuti (2009) – using a different dataset – find a similar result of stationarity for Italy's trade balance series in the years 1861-2004.

Persistent external deficits could constrain economic growth because increasing the interest rates the nation has to pay to attract foreign capital, and they could impose an excessive burden on future generations increasing interest payments and lowering the standard of living. However, Fenoaltea (2011) suggests that Italy's external deficits in the years 1860-1913 were determined by capital inflows. They financed imports of machinery, technology and raw materials boosting productivity and exports. These in turn prompted CA readjustment and did not curb economic growth.
Hence, a CA temporary disequilibrium appears because the nation imports more capital than before. As a result, the real exchange rate rises (as the currency appreciates, or the domestic price level increases relative to the foreign one). This surge in the real exchange rate in turn increases the CA deficit.

Table 1. Stationarity of the Italian current account to GDP ratio, real exchange rate, real capital stock in machinery and equipment (logs), real investment in machinery and equipment (logs) – A summary

Variable	**Degree of integration from the ADF test - OLS**	**Degree of integration from the ADF test - GLS**	**Degree of integration from the KPSS test**
Current Account: 1861-2010, N = 139.			
CA/GDP	ADF(0): I(0)	ADF(0): I(0)	ADF(0): I(0)
CA/GDP	ADF(1): I(0)	ADF(1): I(0)	ADF(1): I(0)
CA/GDP	ADF(4): I(0)	ADF(4): I(0)	ADF(4): I(0)
Current Account: 1861-1913, N = 52.			
CA/GDP	ADF(0): I(0)/I(1)	ADF(0): I(0)	ADF(0): I(0)
CA/GDP	ADF(1): I(0)/I(1)	ADF(1): I(0)/I(1)	ADF(1): I(1)
CA/GDP	ADF(4): I(1)	ADF(4): I(1)	ADF(4): I(0)
Δ (CA/GDP)	ADF(0), ADF(1): I(0)	ADF(0), ADF(1): I(0)	ADF(0) , ADF(1): I(0)
Current Account: 1929-2010, N = 72.			
CA/GDP	ADF(0): I(0)	ADF(0): I(0)	ADF(0): I(0)
CA/GDP	ADF(1): I(0)	ADF(1): I(0)	ADF(1): I(0)
CA/GDP	ADF(4): I(0)	ADF(4): I(0)	ADF(4): I(0)
Current Account: 1948-2010, N = 55.			
CA/GDP	ADF(0): I(0)	ADF(0): I(0)	ADF(0): I(0)
CA/GDP	ADF(1): I(0)	ADF(1): I(0)	ADF(1): I(0)
CA/GDP	ADF(4): I(0)	ADF(4): I(0)	ADF(4): I(0)
Other variables: 1861-1913, N = 52.			
$\mathcal{E}$	ADF(0): I(1)	ADF(0): I(1)	ADF(0): I(1)
$\mathcal{E}$	ADF(1): I(1)	ADF(1): I(1)	ADF(1): I(1)
$\mathcal{E}$	I(1)	I(1)	I(1)
$\Delta\mathcal{E}$	I(0)	I(0)	I(0)
Lreal KE	ADF(0): I(1)	ADF(0): I(1)	ADF(0): I(1)
Lreal KE	ADF(1): I(1)	ADF(1): I(1)	ADF(1): I(1)
Lreal KE	ADF(4): I(0)I(1)	ADF(4): I(0)I(1)	ADF(4): I(0)I(1)
Δ Lreal KE	ADF(0) , ADF(1): I(0)	ADF(0) , ADF(1): I(0)	ADF(0), ADF(1): I(0)

Notes: I(0) means stationary series (no unit root is present). I(1) means non stationary series (i.e presence of at least one unit root). The null of the ADF tests is non stationary series (unit root) while the null of the KPSS is stationary series. See Dickey and Fuller (1979) and Kwiatkowski et al.

The Fenoaltea's argument can be tested by using a F test strategy as suggested by Granger causation analysis. Our variables of interest are I(1) and not cointegrated, hence this strategy is performed on ADL models as outlined in table 2.[3]

[3] If cointegration exists ECM models instead of ADL models must be used to take into account long run equilibria. Results on cointegration among the levels of these series are in Pistoresi Rinaldi (2013).

From all the specifications in Table 2, the exogeneity of the real exchange rate strongly emerges: changes in CA/GDP and in real capital stock in machinery and equipment do not (Granger) cause variations in real exchange rate, while we find unidirectional Granger causation from real exchange rate to the CA to GDP ratio. Italy's persistent external deficits in the years 1861-1913 were determined by capital inflows and not by impulses that rose in the market for goods. We also find unidirectional Granger causation from the CA/GDP variations to real capital stock in machinery and equipment dynamics variations. In brief, our results seem to suggest that Italy's external deficits in the years 1861-1913 were determined by capital inflows, that were used to fund imports that increased the real capital stock in machinery and equipment, thereby prompting productivity and economic efficiency. Thus, they do not seem to have undermined the nation's intertemporal solvency.

Table 2. Current account to GDP ratio, real exchange rate and real capital stock in machinery and equipment (logs)- Granger causality – 1861-1913

Specification 1:

$$\Delta CA/GDP_t = \alpha + \beta_1 \Delta (CA/GDP)_{t-1} + \ldots + \delta_1 \Delta \varepsilon_{t-1} + \ldots + \gamma_1 \Delta LrealKE_{t-1} + \ldots + \eta_t$$

	H_0 : the past does not matter	F test – p-value	Outcome	Causality Conclusion
ADL(1,1)	$H_0 : \gamma_1 = 0$	p-value = 0.29	Fail to reject H_0	Changes in KE growth *do not cause* CA/GDP variations
ADL(2,2)	$H_0 : \gamma_1 = \gamma_2 = 0$	p-value = 0.57	Fail to reject H_0	Changes in KE growth *do not cause* CA/GDP variations
ADL(1,1)	$H_0 : \delta_1 = 0$	p-value = 0.10	Reject H_0 (10%)	Changes in exchange rate *cause* CA/GDP variations
ADL(2,2)	$H_0 : \delta_1 = \delta_2 = 0$	p-value = 0.07	Reject H_0 (10%)	Changes in exchange rate *cause* CA/GDP variations

Specification 2:

$$\Delta LrealKE_t = \alpha + \beta_1 \Delta (CA/GDP)_{t-1} + \ldots + \delta_1 \Delta \varepsilon_{t-1} + \ldots + \gamma_1 \Delta LrealKE_{t-1} + \ldots + \eta_t$$

	H_0 : the past does not matter	F test – p-value	Outcome	Causality Conclusion
ADL(1,1)	$H_0 : \beta_1 = 0$	p-value = 0.08	Reject H_0 (10%)	Changes in CA/GDP *cause* KE growth
ADL(2,2)	$H_0 : \beta_1 = \beta_2 = 0$	p-value = 0.00	Reject H_0	Changes in CA/GDP *cause* KE growth
ADL(1,1)	$H_0 : \delta_1 = 0$	p-value = 0.50	Fail to reject H_0	Changes in exchange rate *do not cause* KE growth
ADL(2,2)	$H_0 : \delta_1 = \delta_2 = 0$	p-value = 0.63	Fail to reject H_0	Changes in exchange rate *do not cause* KE growth

Specification 3: $\Delta \varepsilon_t = \alpha + \beta_1 \Delta (CA/GDP)_{t-1} + \ldots + \delta_1 \Delta \varepsilon_{t-1} + \ldots + \gamma_1 \Delta LrealKE_{t-1} + \ldots + \eta_t$

	H_0 : the past does not matter	F test – p-value	Outcome	Causality Conclusion
ADL(1,1)	$H_0 : \beta_1 = 0$	p-value = 0.72	Fail to reject H_0	Changes in CA/GDP *does not cause* exchange rate variations
ADL(2,2)	$H_0 : \beta_1 = \beta_2 = 0$	p-value = 0.99	Fail to reject H_0	Changes in CA/GDP *does not cause* exchange rate variations
ADL(1,1)	$H_0 : \gamma_1 = 0$	p-value = 0.24	Fail to reject H_0	Changes in KE growth *do not cause* exchange rate variations
ADL(2,2)	$H_0 : \gamma_1 = \gamma_2 = 0$	p-value = 0.87	Fail to reject H_0	Changes in KE growth *do not cause* exchange rate variations

Notes: Robust standard errors estimation.

4. Conclusions

This paper shows that the Italian CA to GDP series is stationary over the period 1861-2010, that is, the Italian economy satisfies its intertemporal external constraint by using the external deficits (or surpluses) to smooth domestic consumption.
We also find that this result is not robust for the shorter 1861-1913 sub-period, when Italy was still a developing economy, due to persistent CA deficits in the 1860s, in the 1880s and in the five years prior to WW1. We find that these CA persistent deficits seem to have been used to fund imports that increased the real capital stock in machinery and equipment, thereby prompting productivity and economic efficiency. Thus, they do not seem to have undermined the nation's intertemporal solvency.

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