

A SURVEY OF COMPETING THEORETICAL APPROACHES TO CURRENT
ACCOUNT DETERMINATION

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Abstract

Recent theoretical approaches to current account determination suggest that the appropriate measure of external balance depends on the country's exposition to international asset trade and the structure of national portfolio. Although valuation changes may reach significant fractions of GDP, the external current account still matters, even for the advanced economies that maintain strong links with the international capital market.

The intertemporal (or dynamic-optimizing) model has kept its reputation of workhorse model in new open economy macroeconomics and through its extended versions has preserved its validity at the beginning of the new century, as well. This does not mean that the other approaches have been declared outmoded. The Mundell-Fleming model, for instance, is still a legitimate tool for policy analysis in many countries. There are calls for revisiting the portfolio balance model on the grounds of increasing international asset diversification, as well. Apparently, there is a growing interest in this particular field of international macroeconomics aimed at re-assessing the importance of the concepts of external balance, adjustment and sustainability.

[...] there have been important changes in economists' views on the subject: from "deficits matter", to "deficits are irrelevant if the public sector is in equilibrium", back to "deficits matter", to the current dominant view "deficits *may* matter".

Sebastian Edwards (2000)

On the relevance of the external current account

As an intermediate target, the external current account appears to be a purely technical concept compared to the economic and social relevance attached to the ultimate macroeconomic goals, such as sustainable GDP growth or low unemployment. The usefulness of this summary statistic of the developments in the macroeconomy has been more associated with the policymakers' concern for stability than with the policies to stimulate economic growth.

Recently, prominent authors in international macroeconomics have reaffirmed the idea that the current account is becoming "increasingly inadequate as a summary of the change in country's net foreign assets" (Obstfeld, 2004). They have highlighted the need for rethinking the concepts of "external balance" and "external adjustment" in industrialized countries in order to capture the significant valuation changes

(capital gains or losses on the net external wealth of nations) that occur in a world of increasing international asset diversification. According to the new look on the external balance, the current account remains relevant concept in the long-run, since the external adjustment operates through the trade channel, i.e. changes in net exports. However, in the short and medium run, the standard national income definition of the current account becomes imprecise indicator of the changes in the international distribution of the wealth. This is particularly relevant for advanced economies, where most of the external adjustment operates through the financial channel (exchange-rate and asset-price movements).²

The conventional view on the current account as a broad reflection of domestic imbalances has also been questioned. Recent studies argue that the (capital) financial account has often been missing from the external adjustment analysis (Clausen and Candil, 2005). Their findings contend that the ability of the country to sustain large current account deficits has often been associated with the willingness of foreign investors to hold assets in the country. In such episodes, the current account adjustment should be treated as an exogenous event, rather than as an indicator of domestic imbalances, because it is largely driven by the behaviour of non-residents.

These findings are certainly not aimed to discourage future work on the current account determination. On the contrary, they indicate growing interest in this particular field of international macroeconomics and re-assessed empirical importance of the external balance, adjustment and sustainability. Although flawed, the current account balance is still far from a "meaningless concept" in the industrialized countries and still of great significance for credit-constrained developing and transition countries.³

The article is organized as follows. Section 2 summarizes the trade-flows models that dominated the early post-war analytical thinking on current account determination. The next section surveys the modern (at that time) theoretical approaches that emerged in a world of increased capital mobility. The new open-economy models of current account behaviour that have been developed in a forward-looking setting with strongly articulated microfoundations are discussed in Section 4. The last section offers a brief conclusion on the relevance of contemporary theoretical approaches.

Traditional models of current account determination

Early open-economy macroeconomic analysis has investigated the current account behaviour in a partial equilibrium and comparatively static framework. These traditional (also known as trade-flows) models, most notably the elasticity and absorption approaches to the balance of payments, were primarily concerned with the impact of exchange-rate changes on the trade variables. The central idea behind the **elasticity approach** has been that the effect of devaluation on the current account will

² Obstfeld (2004) offers very illustrative example of the importance of valuation changes for the country's net foreign wealth. A firm may decide not to pay the dividend to the foreign shareholders, but to retain the earnings. Although this will not be reflected in the balance-of-payments statistics under the net investment income position in the current account balance, the firm's stock market price will rise and the overall effect on the net external wealth will be the same.

³ As reported by Obstfeld (2004), the former US Treasury Secretary Paul O'Neill has bravely declared that the current account balance has become a "meaningless concept".

depend on the elasticities of demand for exports and demand for imports.⁴ In its technical exposition, the Marshall-Lerner condition states that the sum of the elasticities has to be greater than one in order to expect improvement in the current account. Since devaluation works through price and volume effect, in a short-run, it is conceivable that the price effect could overwhelm (the well-known J-curve) and that initially, the current account could deteriorate. Indeed, the policy debates until mid-1970s were dominated by the two camps of 'elasticities pessimists' and 'elasticity pessimists' regarding the success of devaluation.

The **absorption** approach, whose origins were in the early 1950-s in Sidney Alexander's work, was designed to complement the former approach by incorporating the interactions between exchange rate and income in the adjustment process. Its central message is that the effects of devaluation on the current account depend upon how it affects national income relative to domestic absorption. The net effect on the current account, as suggested by this approach, is often ambiguous, because diverse and conflicting channels are at work and because the economy may (not) operate under full employment.⁵ In light of subsequent approaches, the inspiring work of Harberger, Laursen and Metzler (H-L-M effect) in early 1950s is worth commenting. They conjecture that changes in terms of trade following a devaluation can have two effects on absorption: an income effect and substitution effect.⁶ Adverse terms of trade shock can either induce deterioration or improvement in the current account, depending on whether the income effect (decreased current level of real income and lowered savings) would outweigh the substitution effect (increased consumption of domestically produced goods). Even in its synthesized version, the approach did not succeed to thoroughly investigate the roots of payments imbalances beyond external sector, most notably, to examine the role of monetary factors.

Modern theoretical approaches to the current account

The delineation between the traditional and modern current account theories is usually associated with the introduction of international capital mobility in open economy analysis of Keynesian type. While the former have been primarily concerned with the devaluation effects, modern approaches have broadened the analytical framework by allowing greater role for the implications of monetary and fiscal policy on the overall balance of payments. The landmark work that opened the modern era of open economy macroeconomics is the celebrated joint (theoretical) venture made by Mundell (1962, 1963) and Fleming (1962). Later theories have embraced the role of monetary factors and broader spectrum of assets in explaining the current account behaviour.

Constructed as Keynesian application in an international setup, the **Mundell-Fleming model** is comparatively static model with sticky prices and output that is demand

⁴ The elasticity approach was pioneered by Alfred Marshall, Abba Lerner and later extended by Joan Robinson and Fritz Machlup.

⁵ Sidney Alexander and Fritz Machlup have identified the following effects of devaluation on the national income and domestic absorption: employment (or idle-resources) effect, terms-of-trade effect, real-balance effect, income-redistribution effect, money-illusion effect and expectational effects.

⁶ The conclusions were derived on the basis of one-good open economy model.

determined. The theoretical advance in comparison with previous models of current account determination is that it has incorporated the international capital flows in the famous IS-LM model, making a distinction between the current and capital account transactions. The model operates in the short-run and courageously assumes that the Marshall-Lerner condition holds true, despite its empirical validity in medium and long run.

Although exchange rate, output and employment are the primary concern of the model, it does offer policy prescriptions with regard to the external current account position (Razin, 1995). For instance, it suggests that under flexible exchange rates, an expansionary fiscal policy, *ceteris paribus*, will induce rise of the domestic income and subsequent deterioration of the current account. Depending on the responsiveness of the capital flows to interest rate variations this may lead to either an exchange-rate depreciation or an exchange-rate appreciation. Under fixed exchange rates, fiscal expansion will raise the output (since it is demand determined) and will cause worsening of the external imbalance, other things being equal.⁷ On the other side, an expansionary monetary policy will lower the domestic interest rate and induce a rise in output thereby worsening the current account. The main recommendations however are that by combining monetary and fiscal policy both internal and external balance can be achieved, while the principle of effective market classification depends on the type of exchange rate regime.⁸

There are shortcomings of the model, though. It does neglect the distinction between stock and flows, leaving aside the current stock of productive capital or the level of indebtedness that often may discourage capital inflows. Since it is focused on short-term considerations, the model neglects the long-run budget constraints that govern both the private and the public sector (Frenkel and Razin, 1987). For instance, private sector may increase its savings as a response to higher government expenditure today. Moreover, Obstfeld and Rogoff (2002) underline the inability of the model to predict "how incipient gaps between aggregate demand and output are resolved" under assumptions of sticky prices as well as to include various policy lags. Notwithstanding these shortcomings, the model has been upgraded in various directions and has served for many decades as a convenient framework for policymakers in analyzing current account movements under different macroeconomic policies.⁹ Because of its simplicity, the M-F model is still legitimate tool for policy analysis in many countries.

Increased financial linkages among countries have shifted the research interest from trade relationships to financial variables and the role of capital markets (Salvatore, 2001). In this respect, the monetary and portfolio balance approaches that are concerned with the overall balance of payments rather than the current account *per se*, gained a prominent place in international economics textbooks. The former has been widely used in field work of the international financial institutions (most notably, the

⁷ In addition, increased domestic interest rate will attract capital inflows thereby leaving the overall effect on the balance of payments indeterminate.

⁸ The 'rule' that we need at least two instruments to achieve two targets was introduced by the famous Dutch economist, Jan Tinbergen in 1962, while the principle of effective market classification owes its origins to the work of Robert Mundell in 1968.

⁹ A unified analytical framework of the various extensions of the Mundell-Fleming model has been offered in Frenkel and Razin (1987).

International Monetary Fund), mainly because of its simplicity and low data requirements.

Monetary approach to BoP views the economy's balance of payments as an essentially monetary phenomenon. Its origins can be found in the numerous works of Frenkel, Johnson, Mundell, Polak etc. Money plays a crucial role in the long run both as a disturbance and as an adjustment mechanism, but it is improper to locate the approach under the premises of monetarism.¹⁰ This does not mean that the approach neglects the role of real factors; rather their influence is felt through the effects they generate on money supply and demand. The logic behind the monetary approach is that any stock disequilibrium on the money market produces an effect on the aggregate expenditure. Proponents of the monetary approach argue that surplus in the balance of payments results from an excess in the stock of money demanded that is not satisfied by the monetary authorities and a deficit results from an excess in the stock of money supplied that is not corrected by the monetary authorities.¹¹ Unlike Keynesian models, the monetary model follows the so called 'bottom-up' approach in the analysis of the combined current and capital account, while treating the current account transactions as accommodating items.

There has never been lack of criticism for the monetary approach. The assumption that money is the only asset in existence does not conform to reality with rich menu of assets. In addition, it is unrealistic to expect that the assumptions of full employment and purchasing power parity hold in the short-run. Also causality may lead from expenditure decisions to changes in money demand, rather than vice versa (Pilbeam, 1998). Finally, it does not explain the monetary transmission link to the real sector.

The portfolio-balance approach (or asset market) approach expands the monetary approach by incorporating plurality of financial instruments. Its origins are in the mean-variance theory of Markowitz (1952) and Tobin (1969) which postulates that investors create their portfolios by holding risk-free assets and optimal combination of risky assets. The shares in the portfolio depend on the degree of risk aversion of the investors and the distribution of asset returns.

The traditional portfolio view on the current account has been that countries invest marginal unit of savings in foreign assets, under the assumptions that investment risk is weak and the diminishing returns on domestic capital are stronger (Kraay and Ventura, 2002). Hence, variations in savings are expected to be translated into variations of the current account of the same magnitude. Recent theoretical work has found the traditional portfolio-balance approach inconsistent with the long-run behaviour of the external position. Therefore the proponents of the 'new' portfolio-based theory have offered reconciliation of the apparent contradictions, by analyzing the current account as a reflection of changes in the size and in the composition of the country portfolio. The latter is defined as sum of all productive assets (capital stock) located within the country and its net foreign assets (Ventura, 2001). Current account adjustment may operate through changes in the size of the portfolio (portfolio growth) or through changes in the composition of country portfolio (portfolio rebalancing).

¹⁰ In the seminal IMF working paper "Theoretical Aspects of the Design of Fund-Supported Adjustment Programs" (September 1987), the editors emphasize the eclectic nature of this approach.

¹¹ Under fixed exchange rate, (the current account) deficit draws down the foreign exchange reserves, while under floating exchange rate it causes depreciation of the home currency.

They argue that the traditional view is valid for the short-run: when transitory (positive) income shock occurs, increased savings is not immediately translated into investment, because the adjustment costs would be high and the expected return to domestic capital would decline. Hence, short run variations in the current account are dominated by portfolio rebalancing towards foreign assets, since economic agents prefer to smooth their consumption.

In the long run, the main assumption is that country portfolios remain stable. The new portfolio-based theory predicts that after the initial shock, countries gradually rebalance their portfolios back to the initial composition. Current account behaviour in the long run is therefore dominated by the portfolio growth component.

The asset market approach has attracted the academic and policy interest mostly in the countries with deep capital markets. Since most of the asset trade takes place among advanced economies, transition and developing economies have found it pre-mature to rely on in their open-economy analysis. The model has not been widely employed for the industrial countries either, because of empirical difficulties. Therefore it is not surprising that Obstfeld (2004) calls for revisiting the portfolio balance model on the grounds of increasing international asset diversification. Rapid growth of cross-border asset trade and lessening of the home equity bias has widened the other channel for current account adjustment, the one through capital gains or losses on gross foreign assets and liabilities. The validity of his argument, at least for the short and medium horizon, has been empirically documented for the industrial countries by Gourinchas and Rey (2004).

Driven by empirical considerations, the International Monetary Fund (the IMF) has developed methodology that relies on the **macroeconomic balance approach**. The main purpose of the so called CGER's analytical framework¹² is to assess the extent of misalignment of exchange rates with respect to their estimated medium-run equilibrium level and the 'underlying' external balance (Isard et al., 2001). Initially, the external balance had been defined in terms of balanced or normal capital flows, but given their assessment difficulties, recently the attention has been shifted toward the "underlying", or normal current account position. The latter is defined as the "value of the current account balance that would emerge at prevailing exchange rates if all countries were producing at their potential output levels [...]" (Isard et al., 2001, p. 7). The comparison of this measure with the country's equilibrium saving investment position, which is used as a benchmark (or so called saving-investment norm), reveals the deviation of prevailing exchange rate from the level consistent with the macroeconomic fundamentals.

The New Open Economy Macroeconomics and the Current Account

New open economy macroeconomics can be distinguished from what has been considered as modern international macroeconomics on the basis of its strongly

¹² CGER stands for the Coordinating Group on Exchange Rate Issues, which is an inter-departmental group within the International Monetary Fund, established to assess the exchange rates and current account positions of the major industrial countries and emerging market economies (see more in Isard et al., 2001).

articulated microeconomic foundations combined with imperfect competition and nominal rigidities. Although the theoretical advance has been impressive, there has been a growing concern among international macroeconomists that not much empirical meat has been put on the theoretical bones (Lane, 2001; Bergin, 2004).

The **intertemporal approach** to current-account analysis makes impressive conceptual advance with respect to the traditional approaches through its recognition that private savings and investment result from forward-looking dynamic decisions (Sachs, 1981; Obstfeld and Rogoff, 1994; Razin, 1995), which are driven by expectations of future productivity growth, interest rates and other factors. Underlying assumption of this approach is the possibility of intertemporal trade, which is enabled by capital mobility. Without international lending and borrowing, a country cannot engage in intertemporal substitution in order to smooth its consumption. Therefore, as Razin (1995) points out, the dynamic-optimizing (or intertemporal) approach is expected to be more suitable framework for explaining current account behaviour in the developed economies than in the developing and transition economies that are faced with credit constraints.¹³

Diferentia specifica with respect to earlier models of current account determination are the strong microfoundations of the dynamic-optimizing approach. While this has provided "additional" realism in the assumptions compared to the previous open economy models, the "unfortunate" outcome of the collaboration with the advanced microeconomics has been the import of tedious algebra. Nevertheless, in the most comprehensive survey and work on new theories of current account determination, Obstfeld and Rogoff (2002) present several classes of intertemporal models:

- a. Deterministic vs. stochastic current account models (in the latter, the uncertainty is introduced. For instance, the consumption is no longer constant, but it fluctuates with movements in permanent income - Lubik, 2003).
- b. Finite vs. infinite-horizon intertemporal models.
- c. 'Partially-complete-markets' vs. 'complete-markets' models, where the complete-market model is constructed on the basis of Arrow-Debreu paradigm, which states that there is a market for insuring any type of risk. On the other side, the 'incomplete-markets' model assumes that intertemporal trade takes form in riskless bonds only, while 'complete-markets' model allows for cross-border trading with much richer menu of assets.
- d. Representative-consumer (homogenous-population) vs. over-lapping generations (heterogeneous-population) models.

By combining certain classes of intertemporal models through partial relaxing of some key assumptions, the theoretical literature has offered eclectic array of models, like for instance, the synthesis of the representative-agent and overlapping generations approaches (Weil, 1989; Obstfeld and Rogoff, 1996). Another strand of literature has flourished by offering more analytical intertemporal models constructed by allowing for distinctions between tradable and nontradable goods (in an attempt to merge it with the real-exchange-rate analysis), liquidity constrained (non-Ricardian) and

¹³ It is the liberalization of the capital account that matters, not the type of the country.

unconstrained (Ricardian) consumers (Gali, Lopez-Salido and Valles, 2002), incorporation of habit formation (Gruber, 2002) etc.¹⁴

In its simpler versions, the intertemporal approach assumes incomplete asset markets (free trade with riskless bond only), representative national consumer (homogenous population) and perfect competition in the goods market of a small and open economy. The intertemporal budget constraint is given by the transversality condition (also known as the *no-Ponzi-game* condition), which states that present value of the economy's resources (for consuming and investing) cannot exceed the sum of the initial net foreign wealth and the present value of its output.¹⁵ It also implies that the outstanding net foreign debt has to be equal to the discounted value of future trade surpluses.

The representative consumer with perfect foresight and complete information maximizes (two-period) lifetime utility (U^i) in accordance with the Friedman's permanent-income hypothesis:

$$U^i = u(c_1^i) + \beta * u(c_2^i), 0 < \beta < 1,$$

where β is the subjective discount factor (time-preference factor), measuring the individual's impatience to consume.

The fundamental insights of the intertemporal model, as presented by Obstfeld and Rogoff (2002), can be elaborated in the special case that occurs when the subjective discount factor is equal to the market discount factor or $\beta = 1/(1+r)$:¹⁶

$$CA_t = B_{t+1} - B_t = (Y_t - \hat{Y}_t) - (I_t - \tilde{I}_t) - (G_t - \hat{G}_t)$$

where, B stands for Net foreign assets, Y for output, I for investment and G for government expenditure and the corresponding letters with cap represent the permanent level of the variables.¹⁷

It predicts that when present output exceeds its permanent level, the economy will run current account surplus in order to smooth its consumption. Financing higher investment (than the permanent level) would turn the current account into deficit (or lower surplus), because the residents would acquire foreign saving so that they do not cut their consumption. And finally, higher government expenditure (above the permanent level) would worsen the current account position.

If the assumption of flat consumption path is abandoned, then the model offers additional predictions by introducing the so called consumption-tilt factor:

¹⁴ In order to preserve space, the author has decided to skip the technical exposition of more complex stochastic intertemporal models.

¹⁵ A country cannot indefinitely roll over existing debts by issuing new debt, as Boston faker, Charles Ponzi tried to do in the 1920s.

¹⁶ In this case, the representative consumer desires a flat lifetime consumption path, since $u(c_1^i) = u(c_2^i)$.

¹⁷ The permanent level of variable is defined as the annuity value of the variable at prevailing interest rate or "hypothetical constant level of the variable with the same present value as the variable itself" (Obstfeld and Rogoff, 2002).

$$CA_t = B_{t+1} - B_t = (Y_t - \hat{Y}_t) - (I_t - \tilde{I}_t) - (G_t - \hat{G}_t) + (r_t - \check{r}_t) B_t + \xi$$

where, $(r_t - \check{r}_t) B_t$ is the consumption-tilt factor, r is the world interest rate, which is not constant any more, \check{r}_t is its permanent level and ξ is consumption-adjustment factor that does not alter the main implications. The role of the consumption-tilt factor is to reveal that if the country is net creditor and the present world interest rate exceeds its permanent level, it is expected that the current account would improve (and vice versa), because the sacrifice of consumption units today is being rewarded by exceptionally high world interest rate.

At the central stage in the dynamic-optimizing approach are the expectations of economic agents on how current shocks affect key future economic variables (Sachs, 1981a). Therefore, the distinction between permanent and temporary disturbances is crucial one, since they have different effects on the current account position. The general rule states that economic agents adjust their behaviour to permanent shocks, i.e. they do not borrow against their future income, but smooth their consumption, when temporary shocks occur. For instance, the current account position is unaffected when a permanent rise in output is expected, because the households increase the current level of consumption.

The inclusion of the productivity (shocks) in modelling the current account behaviour represents a path-breaking theoretical work. While the importance of real factors (such as terms-of-trade shocks) has certainly not been ignored in the past theoretical work, the productivity as a long-term determinant has never been explicitly stated. From the intertemporal perspective, the current account is expected to respond to (positive) productivity shocks *directly*, by raising the expected path of future output (in case, they are positive) as well as *indirectly*, by inducing investment and "thereby raising expected future output even further" (Obstfeld and Rogoff, 2002, p. 86).

Glick and Rogoff (1995) have underscored the distinctive effects of global vs. country-specific (or idiosyncratic) productivity shocks. The delineation is an important one: if a shock would hit all economies symmetrically, the effect on the current account would be much smaller than if it hits only a small and open economy. Country-specific productivity shocks may affect the current account more than investment, because both consumption and investment may respond to changes in productivity inducing an even larger response by the current account. Hence, it is possible to decompose current account response to productivity shocks into consumption smoothing effect and investment effect.

Extensions of the intertemporal model have incorporated the earlier applications of Keynesian open-economy models by Harberger and Laursen (1950) and Metzler (1950) in a forward-looking framework (Sachs, 1981; Svensson and Razin, 1983; Obstfeld and Rogoff, 1995). When introducing a three-good (exportables, importables and nontradables) model, the implications from change in terms of trade in an intertemporal perspective become much more complicated, because of the greater role of the substitution effects. On one side, adverse transitory terms of trade shock may induce deterioration of the current account, because the H-L-M (income) effect lowers the current income relative to the permanent and thus, induces consumption-

smoothing response by the economic agents (for more elaborate version, see Cashin and Dermott (1998)). On the other side, the current account may improve because of:

- e. the intertemporal substitution in consumption, caused by the rise of current price of importables relative to the future price of imports that increases current aggregate saving (consumption-tilting effect), and
- f. the intratemporal substitution of consumption, caused by the increase of price of importables relative to the price of nontradables (the real exchange rate effect).

Despite these extensions, the ambiguity of theoretical predictions of the intertemporal model with respect to terms-of-trade shocks remains, leaving the resolution for the applied work.

Earlier intertemporal models have overestimated the 'self-corrective' role of the private sector in shaping the optimal current account. The main argument goes that current account deficits are not a cause of concern as long as they are driven by private sector behaviour, which has come to be known as the Lawson doctrine.¹⁸ The idea of decentralised private decisions maintaining an optimal saving-investment gap, when balanced-budget policy is pursued, was reaffirmed in mid-1990s by Corden (1994).¹⁹ Such views may have been inspired by the popular twin-deficit problems, but from today's perspective, it appears that they have overstated the significance of the fiscal deficits. Most macroeconomists do believe that the Lawson doctrine is discredited and that even private-sector decisions may lead to suboptimal current account outcomes, pointing to the recent experiences with the Mexican and Argentinean crises in mid-1990s and the financial turmoil in emerging markets in Asia in 1997. These events have brought to the fore the notion of sustainability of current account deficits.

A strand of theoretical literature on intertemporal models has incorporated the demographic profile of the country as a determinant of the external imbalance. The so called **overlapping generations model** investigates the current account behaviour as a reflection of the country's intergenerational structure, demographic trends, generational incidence of taxes etc.²⁰ The core of this approach is captured by the life-cycle theory of consumption and saving, pioneered by Modigliani and Brumberg (1954). Its underlying assumption is that finitely-lived individuals and households smooth their consumption through youth, middle-age and retirement.²¹

The fundamental insights of the overlapping generations approach can be seen from a simple model built around small open economy with two types of economic agents, elaborated by Obstfeld and Rogoff (2002). The model is primarily concerned with the

¹⁸ The former British Chancellor of the Exchequer, Nigel Lawson, in September 1988 has identified the fiscal deficits as the crucial determinant of the external imbalances in UK and stated that the latter are never private-sector driven.

¹⁹ Max Corden (1994), *Economic Policy, Exchange Rates and the International System*, Clarendon Press, Oxford, cited in: Reisen (1998).

²⁰ Obstfeld and Rogoff (2002) trace back the origins of the overlapping generations model to the work of Allais (1947) and Samuelson (1958).

²¹ It certainly sounds odd to stress that agents are "finitely-lived", but the theory has worked with the antonym, as well.

savings behaviour of the young population (savers) and old population (dissavers) that live for two periods. The population is assumed to have the following two-period logarithmic utility function:

$$U(c_t^Y, c_{t+1}^O) = \log(c_t^Y) + \beta \log(c_{t+1}^O),$$

So that c_t^Y and c_{t+1}^O refer to consumption of the young and old population, respectively.

Young population starts with no wealth, while the old population consumes its wealth accumulated during the working age (the first period). The young generation is born at date t and has N_t members that can change over time $N_t = (1+n)N_{t-1}$, so that n is the growth rate of generations and also of total population, $N_t - N_{t-1}$. If Y is the total GDP, then the aggregate private saving rate is given by:

$$\frac{S_t^P}{Y_t} = \frac{N_t - N_{t-1}}{N_t y^Y + N_{t-1} y^O} \frac{s^Y}{(1+n) y^Y + y^O} = \frac{n s^Y}{(1+n) y^Y + y^O}$$

so that,

S_t^P = aggregate saving

s^Y = saving of a typical member of young generation (individual saving)

Y_t = total GDP

y^Y = per capita endowment of the young generation, and

y^O = per capita endowment of the old generation.

If the last expression is differentiated and if s^Y is positive:

$$\frac{d(S^P/Y)}{dn} = \frac{s^Y (y^Y + y^O)}{[(1+n)y^Y + y^O]^2} > 0$$

it can be seen that when the population growth rate increases, the savings rate goes up, because the number of young people (savers) rises relative to that of the old generation (dissavers).

The predictions of the overlapping generations models have shed more light on some counter-intuitive findings by the representative-consumer models. For instance, the latter predicts that fast-growing economies tend to have lower savings and run current account deficits. It is the overlapping generations model that allows heterogeneity in the consumer's population and states that if these countries have high portion of active population, it is plausible that they have higher savings and run current account surpluses. Further theoretical work on overlapping generations models has also integrated the important issues of intergenerational altruism and bequests into the analysis of current account determination (Obstfeld and Rogoff, 2002).²²

²² Bequests are defined as motives that arise when individuals care about the welfare of future generations.

Empirical work devoted to testing the predictions of the intertemporal approach, most notably the present-value tests (for instance, Sheffrin and Woo, 1990), has provided important feed-back information for further theoretical modifications. Predicted current account values or debt-GDP ratios have been much higher than the observed one leaving the uncomfortable conclusion that most of the countries are engaged in sub-optimal intertemporal trade. For instance, Obstfeld and Rogoff (1996) following a simple intertemporal approach found that the optimal current account response in the case of Spain was deficit of 60% of GDP, while the actual deficit was 3.4% of GDP.²³ Hence, empirically richer intertemporal models that are tailored to the country's specifics have been recommended. For instance, Ventura (2002) proposes amendments to the intertemporal approach with respect to industrial countries, by giving prominence to the investment risk and adjustment (or capital installation) costs. He stresses the different behaviour of current accounts in short and long-run, which may be explained by the adjustment costs of installing new capital.

The dynamic general-equilibrium setting with solid microfoundations and the crucial role of the expectations are by no means strong advantages of the intertemporal approach. On the shortcomings side, the assumption of rather strong financial linkages among countries remains questionable. Although there is a clear post-war trend of reduced transport costs, dramatically fallen tariffs and increased international asset diversification, the empirical research still confirms the presence of home bias in trade and equities (Obstfeld and Rogoff, 2000).²⁴ The approach fails to take into account short-run price rigidities and assumes complete pass-through of exchange rate changes to import prices (Obstfeld, 2001).

2. In addition, the highly sophisticated intertemporal models are being transformed with obvious difficulties into tractable equations in the applied work, which points to a serious disconnect between the theory and the empirics. Another set of problems arises from the empirical hunger for large set of data and longer time series that is severely felt in many developing and transition economies. It is not surprising therefore that the empirical work on dynamic-optimizing models is far behind the recent theoretical advance and has not penetrated the discussions in the policy circles, thereby leaving more breath space for previous and simpler open economy models.

Eclectic theoretical approaches have followed 'broad-brush characterization' of the structural factors behind the current account behaviour (Chinn and Prasad, 2000). The research has used set of country-specific macroeconomic variables (such as, real exchange rate, output growth, fiscal balance etc.) and exogenous variables (terms of trade, global GDP growth, world interest rate). The message that models of eclectic nature have sent to the empirical work is that the joint endogeneity of the external imbalances and other macroeconomic variables must not be overlooked.

Mainstream neoclassical theory focuses on the negative consequences of volatility of terms of trade and capital flows on economic growth (Razin and Rubinstein, 2004), considering growth as purely a supply-side phenomenon. Albeit not a mainstream theory of international economics, **the balance-of-payment constrained growth**

²³ Cited in Edwards (2000).

²⁴ We refer to J. McCallum's home bias in trade puzzle and the French-Poterba equity home bias puzzle.

models stress that countries cannot grow faster than the rate consistent with balance of payments equilibrium on current account (Thirlwall, 2000). The view differs from standard neoclassical models, by recognising the fact that aggregate demand and balance-of-payments constraints are essential determinants of long-run economic growth.

Concluding remarks

New theoretical approaches to current account determination have converged towards consensus that the appropriate measure of external balance depends on the country's exposition to international asset trade and the structure of national portfolio. Although valuation changes may reach significant fractions of GDP, the external current account still matters, even for the advanced economies that maintain strong links with the international capital market. The intertemporal model has kept its reputation of workhorse model in new open economy macroeconomics and through its extended versions has preserved its vitality at the beginning of the new century, as well. This does not mean that the other approaches have been declared outmoded. On the contrary, the empirical difficulties with the dynamic-optimizing framework have confirmed that the evolution of analytical thinking on current account dynamics has been divided on competing paths.

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