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Growth and Poverty Reduction Under Globalization: The Systematic Impact of Exchange Rate Misalignment

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Abstract

The paper presents an assessment of the role of economic growth under globalization in achieving the first target of the Millennium Development Goals (MDGs), namely to halve the incidence of abject poverty in the world by year 2015. The analysis is composed of two parts. First, by following the consensus in the relevant literature we address economic growth as the most effective instrument for achieving poverty reduction. In evaluating the feasibility of this approach we extend the "exit-time" concept and we find that at least one half of all the targeted countries, and the totality of countries in the poorest group, will not achieve the first target of the MDGs if they continue on their historical trajectory of economic growth in the future. This finding highlights the importance of increasing the rate of economic growth, especially for the poorest countries, as a necessary condition of effective poverty reduction. Next we focus on the imperative of accelerating the rate of growth in

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the poorest countries of the world if the MDGs were to be achieved. In a standard reduced-form growth-regression model fitted with cross country data we introduce the exchange rate misalignment defined as the chronic deviation between the nominal exchange rate and the purchasing power parity rate. We confirm the negative relationship between misalignment and growth and, most importantly, the analysis points to the misalignment of exchange rates as originating in the currency substitution that takes place in developing countries and results in the systematic devaluation of their currencies which, in turn, further exacerbates exchange rate misalignment. This finding highlights the importance of the proper combination of trade and exchange rate policies in fostering growth in developing countries in the current environment of globalization.

Keywords: millennium development goals (MDGs); exchange rate misalignments; economic growth and feasibility of MDGs; openness of the economy and economic growth; currency substitution and exchange rate misalignment.

JEL Classification: I39, O19, O47

1. Introduction

The Millennium Declaration of the United Nations signed by 189 countries, including 147 Heads of State, on September 8, 2000, led to the Millennium Development Goals (MDGs). The MDGs formalize the international community's unprecedented agreement on the development goals by 2015 with explicit numerical targets for reducing poverty in the world. The first goal of MDGs is to eradicate extreme poverty and hunger, with the interim explicit

target of decreasing by 2015 the extent of poverty by one half, defined as halving the proportion of people whose income is less than one dollar a day, as compared to the same proportion in 1990. With the 1990 baseline for the head count ratio being 27.94 percent of the total, the targeted ratio of a-dollar-a-day for MDGs corresponds to 13.97 percent of the world's population (World Bank, 2004).

The focus of this paper is on the feasibility of achieving this target and on the appropriate policy instruments for doing so. While direct poverty reduction programs may be effective, their costs could become prohibitive if they were targeted to the communities that are the poorest, and therefore the less easily accessible (Besley and Burgess, 2003). In skirting this dilemma, a good part of the literature advocates a higher rate of economic growth as an alternative and a more effective approach toward a comprehensive poverty reduction program. The empirical literature that supports this view rests on a strong and statistically significant relationship between macroeconomic growth and poverty reduction (Ravallion, 2001; Dollar and Kraay, 2002; Besley and Burgess, 2003).

Globalization, defined as the cross-national integration and interdependence of the world's markets of goods, labor and finance, as well as businesses and cultures, is generally considered an important driving force for enhancing economic growth (World Bank, 2002). This causality, by implication, makes economic growth an effective instrument for reducing poverty in developing countries (Dollar and Kraay, 2002).

The existing literature identifies different channels that lead from globalization to economic growth. First, there is a direct positive relationship between the trade openness of a country and its economic growth (Harrison, 1996; Dollar and Kraay, 2004). Second, foreign direct investment (FDI) has been found to be an important venue for transferring technology; therefore FDI can contribute

relatively more to growth than domestic investment. This positive nexus between FDI and growth works especially well when the host economy is endowed with sufficient absorptive capability for assimilating advanced technologies (Borensztein *et al*., 1998). Finally, not only direct investments across countries but also indirect capital flows might affect growth positively.

These virtuous synergies between globalization and growth are subject to the caveats of misalignment of exchange rates. Harrison (1996) and World Bank (1991) found that a black market premium in foreign exchange rates is negatively associated with growth. This observation leads to the implication that chronic misalignment in the exchange rate has been a major source of slow growth in Africa and Latin America through deterring smooth flows of capital, while prudent macroeconomic, trade, and exchange rate policies have fostered growth in Asia (Dollar, 1992; Edwards, 1988; Ghura and Grennes, 1993; Rodrik, 1994).

This paper evaluates the role of economic growth under globalization in achieving the first target of the MDGs, i.e. of decreasing by one-half the headcount of poverty in the world. Section 2 approaches economic growth as the one important instrument that can serve in achieving the above target. We extend the concept of "exit time" of Kanbur (1987) and Morduch (1998) to reach a quantitative assessment of the success or failure of the MDGs by comparing the requisite rate of growth for the target group to exit poverty with the historical growth trajectory (of the years 1960-90) for each country in question. The inevitable result is that more robust growth is necessary for the success of the MDGs as compared to the historical record of growth.

The finding in Section 2 that "growth as usual" could not deliver the MDGs is challenging. In the least it makes a compelling case for the re-examination of the mechanics of growth. The novelty in Section 3 is that it addresses the mechanics of growth by extending the truncated treatment of the subject in the

literature of exchange rate misalignment. This is done by accounting for systematic deviations of nominal exchange rates from their purchasing power parity levels and considering the possibility that such deviations could cause systematic distortions in resource allocation leading to growth debacles.[1] Moreover, these same deviations could provoke severe instabilities of the international macroeconomic system, and especially so in the environment of the ongoing globalization. Despite the compelling reasons that militate for chronic exchange rate misalignments having strongly negative effects on a country's rate of growth, there is relatively little empirical evidence on the subject, with the only possible exception being the systematic cross-country analysis conducted by Yotopoulos (1996). In an attempt to fill in this gap in the literature we employ the Yotopoulos and Sawada (2006) empirical formulation of chronic misalignment in nominal exchange rates, in order to indirectly reassess the prospects of the target countries for achieving the requisite rates of economic growth for meeting the first MDGs target, given the extant realities of their exchange rate regimes.

In an effort to identify more closely the specific source of exchange rate misalignment we formulate in Section 4 the currency substitution hypothesis that is consistent with the severe exchange rate misalignment and with the faltering of growth that we observe in many developing countries during the current era of globalization.

Section 5 provides the conclusion on the MDGs and on the policy approaches that could increase growth by alleviating the severe negative impact that exchange rate misalignment is likely to have on achieving the rates of growth requisite to reach these targets.

[1] As, for instance, exemplified in Yotopoulos and Sawada (1999).

2. The Role of Economic Growth in Reducing Poverty

In investigating the role of macroeconomic growth in reducing poverty, the well-known article by Dollar and Kraay (2002) showed that economic growth is a necessary condition to achieve poverty reduction. Besley and Burgess (2003) and Ravallion (2001) estimated the poverty reduction elasticity with respect to income by using cross-country data and a micro data set, respectively. Both studies found that the elasticity is significantly negative, although the actual estimates diverged from -0.73 for Besley and Burgess (2003) to -2.50 for Ravallion (2001).

Seeing that these approaches will not provide us with practically relevant parameter estimates for each country, we employ alternatively the concept of "exit time" of Kanbur (1987) and Morduch (1998). Using this approach we can estimate the growth rate that is required for each country to achieve the first target of MDGs and we compare the result with the country's historical trajectory of growth. By doing so, we will be able to analyze how country-specific economic growth can deliver as the prime actor in effectively achieving poverty reduction.

The exit time, t, is given by the time a person i with income y_i below poverty line z, will exit the poverty situation (Morduch, 1998):

$$t_i = \frac{\ln(z) - \ln(y_i)}{\ln(1+g)}, \tag{1}$$

where g is the growth rate of income of this person. Kanbur (1987) introduced the exit time of the "average poor" (superscript a) with mean income of the poor, μ_P:

$$t_i^a = \frac{\ln(z) - \ln(\mu_P)}{\ln(1+g^a)}. \quad (2)$$

Let $P(\alpha)$ be the poverty measure as per Foster *et al*. (1984) where $P(0)$ and $P(1)$ are the poverty head count ratio and the poverty gap measure, respectively. Ravallion *et al*. (1991) showed that $P(1)=[1-(\mu_P/z)]P(0)$. Then equation (2) can be rewritten as:

$$t_i^a = \frac{\ln[P(0)] - \ln[P(0) - P(1)]}{\ln(1+g^a)}. \quad (3)$$

Similarly, with the median income of the poor, μ_m, Morduch (1998) showed that the time to halve the number of the poor can be computed by:

$$t_i^m = \frac{\ln(z) - \ln(\mu_m)}{\ln(1+g^m)}. \quad (4)$$

By using equation (3), we can compute the required income growth rate for the average poor in 1990 to exit poverty by 2015:

$$g^a = \exp\left[\frac{\ln(P(0)) - \ln(P(0) - P(1))}{25}\right] - 1. \quad (5)$$

Tables 3.1 and 3.2 show the required economic growth rates as computed from equation (5) using the Global Poverty Monitoring database of the World Bank. Note that the required growth rate for the median poor in 1990 to exit poverty by 2015 based on equation (4) can be interpreted as the required growth rate for the first target of MDGs. Yet, using the fact that $\mu_P<\mu_m$ in the lower tail of a unimodal income distribution function, it is straightforward to show that this required growth rate based on the concept of the average exit time can be interpreted as the upper bound of the required growth rate to achieve the first target of MDGs (Sawada, 2004).

TABLE 3.1 NEAR HERE

TABLE 3.2 NEAR HERE

Our results in Table 3.1 suggest that about one-half of the countries whose per capita income is above US$ 2,000 can achieve the first target of MDGs by maintaining their historical levels of economic growth rate (1960-1990). The same successful-by-one-half record is maintained in Table 3.2 for the countries that had per capita income in year 1990 between US$ 1,000 and US$ 2,000. In the same table the second and poorest cohort of countries with per capita income below US$ 1,000 is a complete failure; no country in this group will be able to reach the first target of MDGs by replicating its past growth record. These findings highlight the importance of accelerating economic growth, particularly for the poorest economies, as a necessary condition of effective poverty reduction.

Table 3.3 again utilizes the exit time concept to compute the required growth rate by region, using the Global Poverty Monitoring data set. The results are comparable with the figures computed by Besley and Burgess (2003), also shown in Table 3.3.

TABLE 3.3 NEAR HERE

In general, the exit-time-based estimates give lower required annual per capita growth rates than the Besley-Burgess estimates except for the Eastern Europe and Central Asia regions. Moreover, according to the same table, growth performance that tracks a country's past trajectory will reach unambiguously the first MDGs target only in the group of Asia-Pacific and conceivably also in the Middle East and North Africa group. Therefore, Table 3.3 also reinforces our conclusion of the need for more robust economic growth, as compared to the targeted countries' growth records (1960-1990), and especially so for the poorest countries in the sample.

3. Chronic Exchange Rate Misalignments and Economic Growth

The previous section lays heavy responsibility for achieving the first target of MDGs on the acceleration of growth in developing countries. A timely acceleration of growth becomes especially critical for the countries at the low end of the distribution, those with GDP per capita less than US$ 1,000. What are the chances that adequate growth records can be achieved to reach the MDGs? Given the strong results in the literature linking development failures to exchange rate misalignment, such as Dollar (1992), Edwards (1988), Ghura and Grennes (1993), Rodrik (1994) and Yotopoulos (1996), this section delves into the subtleties of the relationship between exchange rate misalignment and growth. The innovation in this paper is the adoption of a new conceptual framework for measuring exchange rate misalignment and identifying its origin. Why is this necessary?

Misalignment is normally defined as the systematic deviation of the nominal exchange rate (NER) from purchasing power parity (PPP), or in a looser

formulation its deviation from the real exchange rate (RER). The relationship between the nominal and the real exchange rate has always been a challenge to economists. The attempt to untie this Gordian Knot dates to the writings of Cassel (1921) and Keynes (1923) who were interpreting the experience of the first globalization (roughly between 1870 and 1914). Only in the recent years of the second globalization economists have adopted an over-simplified conventional framework and have considered the Knot non-existent (Yotopoulos, 1996: Ch. 5).

The standard shortcut on which the measurement of exchange rate misalignment is based involves the comparison of a country's (*i*) real price level (*RPL*) at time *t* with that of the numeraire country (*US*), in some form of the equation (6):

$$RPL(i,t) = \frac{1}{e(i,t)}\left[\frac{P(i,t)}{P(US,t)}\right], \qquad (6)$$

where *e* and *P* represent a country's nominal exchange rate and overall price level, respectively.[2] For a number of reasons this formulation is unsatisfactory, the most important being that in cross-country comparisons where exchange rates are involved, any aggregate index that intends to capture relative price levels, while totally disregarding the distinction between tradables and nontradables, is misleading and deficient. As an example, a change in the exchange rate, whether appreciation or devaluation, will have more (or less) profound effects in the economy, and in the allocative function of prices, depending on the structure of the economy, the level of income, the size of the tradable and the nontradable sector, and so on. Even worse, since a "successful devaluation" implies an increase in the price of tradables and a corresponding

decrease in the relative price of nontradables (in units of the home currency), in the best of all worlds not much would be registered in equation (6) that reflects a change in the price index or the PPP.

"Country-specificity" that is totally absent from the above equation can be introduced by decomposing the price index into its two components, P_T and P_N, denoting prices of tradables and nontradables, respectively (Yotopoulos, 1996: Ch. 6). As an alternative, and for economy of data and computation, nominal exchange rate misalignment can be captured readily with the following decomposition (Yotopoulos and Sawada, 2006):

$$\frac{1}{e(i,t)} = \left[\frac{P_T(US,t)}{P_T(i,t)}\right] u(t)\varepsilon(i)w(i,t)\,. \qquad (7)$$

In equation (7), P_T, is the price of tradables and the price ratio, $P_T(i,t)/P_T(US,t)$, represents the purchasing power parity in prices of tradables. Note that the misalignment of NER from PPP has been decomposed into a common aggregate time-specific component, $u(t)$, a country-specific time-invariant fixed component (i.e. country fixed effects), $\varepsilon(i)$, and another time-variant random component, $w(i,t)$. The time-specific term, $u(t)$, can be interpreted broadly as representing the time-trend of exchange rate parity fluctuations of the US dollar.[3] The variable $\varepsilon(i)$ represents the degree of the country-specific *chronic misalignment of the nominal exchange rate*, NER, which can be attributed to systematic factors, such as country-specific structural characteristics of an economy, chronic market imperfections, transaction costs,

[2] Note that this relative price level is the inverse of a simple version of the real exchange rate.
[3] Note however that country-specific effects for the numeraire country, the US, are not captured.

and/ or government (dis)intervention in the foreign exchange market in country *i*. In other words, $\varepsilon(i)$ is a long-term, (i.e. chronic) deviation of NER from PPP.

The variable $\varepsilon(i)$ is intended to capture the effect of any systematic characteristics of (developing) countries that bear on exchange rate misalignment and are not specifically accounted for in equation (6). The Ricardo principle, also known as the Samuelson-Balassa equation, states that the relative prices of tradables to non-tradables decrease in the process of development (Ricardo, 1817; Balassa, 1964; Samuelson, 1964). This systematic relationship, whether it originates in productivity differentials (as per Ricardo) or in factor proportions (as per Samuelson or Balassa) constitutes a structural characteristic of an open economy in the process of development. The systematic component of the relationship is almost axiomatic. Whether as a result of labor being cheap in low-income countries (the productivity approach), or labor being plentiful in relation to capital (the factor proportions approach), the prices of nontradables relative to tradables tend to be cheap in developing countries and increase as development occurs. By the same process, not only the internal terms of trade (the real exchange rate) improve, but the law of one price dictates that the prices of tradables tend to converge across countries. The result of these two effects should be that misalignments, defined as deviations of the real exchange rate (formed in the price domain of tradables and nontradables) from the nominal exchange rate (formed in the domain of tradables alone) are likely to be smaller in the developed countries and greater in the developing ones.

The discussion of the Ricardo principle above has an important corollary for the measurement of exchange rate misalignments. Controlling for the nominal exchange rate, the extent of exchange rate misalignment in a specific case is determined by the structural characteristics of a country at a certain stage of development. As a result, misalignment cannot be properly assessed unless the relative prices of both the tradables and the nontradables are accounted for in

the method of measurement. Looking at it in another way, this means that the impact of a change in the nominal exchange rate on the relative prices of tradables and nontradables is muffled in developed countries where these prices are more closely aligned; in developing countries, on the other hand, the attendant reallocation of resources as a result of the same change in the exchange rate can be sizeable – and what is worse, it can become a potent factor driving the systematic *mis*-allocation of resources!

We implement the Yotopoulos and Sawada (2006) procedure in specifying equation (7) for measuring the chronic NER deviation, $\varepsilon(i)$. We use the familiar cross-country data set of Heston *et al*. (2002), for 153 countries, covering a span of 20 years, from 1980 to 2000. We then estimate a standard cross-county growth regression by adding the measure of chronic NER deviation as an additional variable.

In the estimated growth regression in Table 3.4 the dependent variable is the average annual growth rate of real GDP per capita between 1980 and 2000. The variable that measures the chronic exchange rate misalignment comes from the implementation of equation (7) as above. We use the dummy variable for trade openness developed by Sachs and Warner (1995) and we create an openness/ exchange-rate-misalignment interaction variable. We hypothesize that the negative impact of exchange rate misalignment on growth is severe when a country is more open to the external economy and thus becomes susceptible to changes in the global economy. Accordingly, the key variable we are interested in is the interaction term of the chronic exchange rate misalignment and openness. The rest of the independent variables in the table are traditional in growth regressions. The data of real GDP per capita are extracted from Heston *et al*. (2002). Following Burnside and Dollar (2000), we consider the policy quality index as formed by a linear combination of the budget surplus, the inflation rate and the trade openness. We add the government share of per capita GDP as another variable. The dummy variables

for African, Latin American, and high-performing East Asian Countries are included in order to mitigate an omitted variable bias from unobserved heterogeneity.

TABLE 3.4 NEAR HERE

Table 3.4 presents the estimated results using OLS with White's heteroskedasticity-consistent standard errors. The estimates confirm the results already familiar in the literature. The per capita income and the exchange rate misalignment measure have a negative (but non-significant) impact on growth; the coefficient for the policy quality index is positive and significant; the country dummies for regional groupings have all (highly) significant coefficients, negative for Africa and South America and positive for the high-performing East Asian countries. These results are canonical and unassailable: the coefficients have the expected signs and are consistent with previously estimated cross-country growth regressions such as the studies listed in Durlauf and Quah (1999).

The one novel and surprising result is the misalignment-openness interaction variable that has consistently negative and highly significant coefficients. The inevitable implication is that the more open the economy, the more pernicious is the effect of the chronic exchange rate misalignment and the more punishing is its impact on growth. In other words, the closed economy can achieve more growth, the degree of exchange rate misalignment notwithstanding. The theoretical conundrum is how to explain this negative interaction of openness and misalignment?

The Sachs-Warner dummy variable for openness rests largely on absence of government control on major tradable goods and absence of high (greater than 40 percent on the average) tariffs on machinery and materials. The remaining component of the openness dummy variable is a black-market premium of

foreign exchange that is less than 20 percent; while any higher premium makes the economy closed in the Sachs-Warner definition. A low black market premium indicates a high degree of globalization and therefore good integration with the global economy. The misalignment of the NER, on the other hand, can also be the outcome of a systematic devaluation due to the softness of the currency. Although the two may be causally related, they are not so in our model since they are not both endogenously determined. So the puzzle remains: How could a low degree of openness interact with misalignment to deliver a positive impact on growth?

4. Could Currency Substitution Account for the Punishing Effects of Misalignment in an Open Developing Economy?

The discussion in the previous Section was hypothesis-driven. With the introduction of the distinction between tradables and nontradables in equation (7) we control for the impact of openness ("globalization") in increasing trade in goods and services of a developing country with its trading partners. At the current state of the empirical evidence there is a dearth of hard data on currency substitution to make its research hypothesis-driven.[4] We therefore engage in hypothesis-generating research in the balance of this paper to discuss the likely impact of currency substitution on exchange rate misalignment to the extent that misalignment can also be exogenous in the sense that it does not originate in the usual shift in demand and supply of foreign exchange for transactions purposes that are registered in the current account.

In the current environment of globalization the concepts of free markets and free trade are extended to apply also to free markets for foreign exchange and to free financial capital flows (portfolio capital), thus allowing for foreign currencies to be bought and held as assets not only by Central Banks but also,

and to a large extent, by individuals, and especially so in developing countries. Unless this currency substitution is otherwise sterilized it results in higher exchange rates than what would have obtained from the current account transactions. However, sterilization through increasing foreign demand for the domestic currency of developing countries is not forthcoming since not all currencies were created equal. While any currency or other fiat money can be used as a consensual medium of exchange, the currency held as an asset trades as a positional good based on *reputation*.[5] In the ordinal reputational ranking of currencies from the "best" to the "worst" that becomes applicable when currencies are held as assets, the reserve currency ranks at the top. The dollar, therefore, systematically substitutes in agents' portfolia for a wide swath of less-preferred currencies. In free currency markets this asymmetric reputation of currencies induces asymmetric demand for holding currencies as assets. Therefore, while residents of developing countries include in their portfolio the reserve/ hard currency for asset-holding purposes, residents of hard-currency countries have not a matching interest in holding soft currencies, those of developing countries. In the open economy model of the modern era of globalization the devaluation of the nominal exchange rate in developing countries is more often than not the result of currency substitution, as opposed to the transactions demand for foreign exchange for servicing the current account (Yotopoulos, 1996: 50-1; 2006).

Ordinarily devaluations are considered benevolent, and especially so for developing countries, since they strengthen the current account and serve to

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[4] Cf. Sawada and Yotopoulos (2005) for an attempt at a hypothesis-driven research on the subject.

[5] The parallel literature on "positional goods" identifies the social "pecking order" as "a shared system of social status," where, e.g. it becomes possible for an individual (a good) to have a positive amount of prestige (reputation) such as a feeling of superiority, or a "trendy" appeal, only because the other individuals (goods) have a symmetrical feeling of inferiority, i.e. have less or negative reputation (Hirsch, 1976; Frank and Cook, 1976; Pagano, 1999). In extending this literature and viewing foreign exchange as a "positional good" we postulate that in a free currency market, the simple fact that reserve/ hard currencies exist, implies that there are soft currencies which are shunned for some (asset-holding) purposes. Cf. also Pagano (2006) and Yotopoulos (2006).

cure allocative inefficiencies. The question arises why is the exogenous devaluation of a soft currency as a result of currency substitution different and has instead deleterious effects for developing countries leading to a gross misallocation of resources? Yotopoulos (1996) formulates the answer in terms of a time-inconsistency proposition that can trigger currency substitution and parlay it to a sizeable resource misallocation:

> Consider an equilibrium situation in which a bundle of resources produces tradables, *T*, or nontradables, *N*, measured such that one unit of each is worth $1. Entrepreneurs should be indifferent between producing one unit of *T* or one of *N*. But since the soft currency is more likely to be devalued, it becomes risky for the entrepreneur to produce (or hold) one unit of *N* that could not be converted for later spending into $1. Expressed in another way, entrepreneurs are attracted to producing *T* because that is the only way they can acquire $1 they wish to hold for asset purposes. With the relative productivities of the bundle of resources (measured at "normal" prices) remaining unchanged, *N* becomes undervalued and (the allocation of) resources becomes biased towards *T*. This is manifest in a relative price of *N* that is too low compared with productivities, (in other words) too high an RER.
>
> This dilemma does not exist for the D(eveloped) C(country) producer. In hard currency, $1 of *T* will always be worth $1 of *N,* as opposed to the soft currency where the expectation of devaluation becomes a self-fulfilling prophecy. Controlling for the other determinants of devaluation in developing countries, the process alone of converting soft currency into hard for asset-holding purposes tends to make the market-clearing NER too high. This is manifest in the relative price of

> tradables that is too high compared with productivities – again too high an RER.
>
> (Yotopoulos, 1996: 51)

By allowing for the possibility that currency substitution is exogenous, as defined above, we proceed to investigate its possible outcomes on LDCs in terms of exchange rate misalignment.

In a globalized world, the free market in currency exchanges offers the opportunity of conversion of domestic into foreign currency. In the case of developed countries the "reputation" of their reserve/ hard currency makes this conversion of their local currency immaterial and unnecessary: the hardness of their currencies allows the producer of nontradables to exchange his proceeds of domestic currency into tradables, or for that matter into hard assets ("dollars") for future use, with a credible commitment for the stability of relative prices (in terms of the domestic currency). In developing countries, on the other hand, the experience with soft currencies is that they do not simply fluctuate; they depreciate systematically. In an attempt to foreclose future devaluation of their soft-currency assets, agents substitute the hard/ reserve currency for the domestic, thus tending to make the devaluation of the soft currency a self-fulfilling prophecy. The current globalization environment with free international movements of financial capital becomes the ideal breeding ground for systematic currency-substitution-induced devaluations and for fostering financial crises in soft-currency (i.e. developing) countries (Yotopoulos, 1996).[6]

This formulation of the hypothesis of currency substitution can be viewed as an extension of the canonical case of market incompleteness for asymmetric

[6] Yotopoulos, (1996: 141-45) proceeds to test for the hypothesis of the transmission of the effects of exchange rate misalignment from the monetary to the real sector of the economy.

information (Stiglitz and Weiss, 1981), but for the fact that in the case of foreign exchange it is *asymmetric reputation* in the positional scale of currencies that anoints only a small and select group of them for doing also service as assets. The canonical policy that becomes applicable in cases of market incompleteness is regulation, most often in the form of rationing. We venture some thoughts on this issue in the concluding Section.

Revisiting the cross-country results reported in Table 3.4 to account for currency substitution, we distinguish two components of the negative and highly significant coefficient of the exchange rate misalignment variable regressed on the openness of the economy. The formulation of equation (7) takes care of the component of misalignment that emanates from the Ricardo principle (Yotopoulos and Sawada, 2006). It reduces to a characteristic of the economic structure of developing countries, and it is reflected in a relatively high value for the RER. Controlling for that, the interaction of the misalignment variable with openness captures the effect of any other likely source of deviation that is not captured in the equation, in this case the degree of openness/ closeness in the economy in the form of a small/ large black market premium of the foreign exchange rate. The negative and significant coefficient of the interaction variable in the growth regression is precisely what the currency substitution hypothesis would predict: high openness of the economy with low transaction costs for currency substitution represents an opportunity for investors (speculators) to profit by buying a cheap insurance policy against the devaluation of the domestic currency. This, in turn, becomes an enabling factor for devaluation; and when devaluation comes it rewards the flight away from the domestic currency. In this environment of "bad competition" with adverse incentives, currency substitution often leads to further devaluations and at times to endemic crises in a process of cumulative causation (Yotopoulos, 1996; Yotopoulos and Sawada, 1999; Sawada and Yotopoulos, 2005). Currency substitution thus becomes a potent factor in

increasing the misalignment of the exchange rate for developing countries – the deviation between the NER and its PPP value, the RER.

Whether the target countries of the MDGs were in the cross-country sample for the growth equation or not (some, of course were) transference of the findings of Table 3.4 to the poorest countries in the MDGs makes the emphatic lesson from the findings of Section 3 ever more ominous. The Ricardo principle was applied earlier as an axiomatic mechanism that accounts for systematic deviations of the NER from its PPP value, with the deviations varying inversely with the level of income in a developing economy. The poorer the economy, the greater is the misalignment of its exchange rate, and the lower is its feasible rate of growth. A parallel relationship holds between currency-substitution induced devaluation of the nominal exchange rate and poverty. In a globalization environment the allure of and the opportunities for currency substitution (by the elites who have the liquid assets to insure against devaluation) are so much greater, the poorer the country is. This taste for currency substitution is intermediated by higher exchange rate misalignment leading to a lower growth potential.

If the negative coefficient of the relationship between openness and growth receives the attention it deserves, the best place for the poorest countries to start in enhancing their growth potential is by imposing a modicum of controls on the free convertibility of their currency. A mild form of such restrictions that has been time-tested in various countries makes foreign exchange available at the free market rate for transactions in the current account, while holding of foreign monetary assets by individuals is prohibited, or otherwise penalized.[7] This would also have ancillary implications in limiting the free flows of portfolio capital into developing countries.

[7] Such a policy was in effect in the UK until 1979. Until early 2006 the Chinese yuan was convertible on the current account only; partial and controlled convertibility on the capital account came later.

5. Conclusions

There is broad agreement in the literature that the objective of the Millennium Development Goals of graduating by year 2015 one-half of the world's denizens who live in abject poverty can best be served by economic growth. Our tests in the first part of the paper indicate that the set goal can only be met by one-half of the target population (or one-quarter of the poor) unless there is a vigorous acceleration of the historical rate of growth in a large number of countries, especially in those among the poorest in the list. Thus our search is refocused in the second part of the paper on the lessons from growth-analysis with cross-country data in an attempt to identify any neglected factors that might be promising for contributing to higher growth rates.

Exchange rate misalignment has featured in the literature as an important factor with negative implications on growth, although its correct measurement has been elusive. Taking a short-cut to the more appropriate specification of exchange rate misalignment as the deviation of the nominal exchange rate from its PPP levels, we conduct an endogenous growth analysis that leads to a surprising result: the significantly negative impact of exchange rate misalignment on growth originates in the openness of the economy. We interpreted this finding as pointing to an incomplete market in foreign exchange in the developing countries of the sample. The market incompleteness arises because of the asymmetric reputation of currencies when they serve for asset-holding purposes and it induces developing-country citizens to engage in currency substitution for the purpose of holding hard-currency-denominated assets.

The results of this study may grate on conventional wisdom. The challenge to the unconventional results may arise either with the definition and measurement of the variable of exchange rate misalignment or in doubts about

their replicability of the results in another sample. The former issue has been adequately addressed in Section 3. On the latter issue, the evidence presented ten years ago with one set of data (Yotopoulos, 1996) is in effect replicated in the current analysis with more recent data, and despite the differences in the empirical formulation of the hypothesis. In the original study Yotopoulos makes three points analytically: First, productivity differences between developed and developing countries are smaller for nontraded goods than for traded goods (the Ricardo principle). Second, free-market forces (in the form of currency substitution) produce nominal exchange rates in developing countries that undervalue the domestic currency, thus leading to high RER, (real exchange rates, i.e. P_T/P_{NT}, for prices of tradables and nontradables, respectively). Third, the combination of the axiomatic productivity differentials with the nominal exchange rate undervaluation combine to create a misallocation of resources that takes a toll on economic growth in developing countries. These propositions were subjected to analysis in a growth model (that included a country-specific RER variable) in a combination of cross-sectional and longitudinal data (years 1970, 1975, 1980 and 1985) for 62 developed and developing countries. The data that entered the RER consisted of prices and expenditures for all tradable and nontradable goods and services, derived from the International Comparisons Project (Kravis *et al*., 1982, and earlier years) and they were combined with statistics on direction of trade in order to determine the country-specific extent of tradability of each good. As such, the econometric tests engaged the RER as a measure of the exchange rate misalignment variable, based on primary data.

In the present study the proper definition of exchange rate misalignment remains the same as in Yotopoulos (1996), but the model formulation, its empirical implementation and the data are different, and so is the measurement of the misalignment variable. Equation 7 in Section 3 of the current study employs a proxy of the misalignment variable that relies on secondary data. The results, however, of the two approaches are identical on the negative

impact of misalignment on growth, despite the different formulation of the variable in the two cases. The coincidence of the two independent studies strengthens our conclusion that interventions in the capital account which are designed to curb the desire of developing-country citizens to hold hard-currency-denominated assets by prohibiting or limiting such holdings, are likely to provide a boost to growth. The simple extension of the standard theory of incomplete markets to apply also to asymmetric reputation of currencies used for asset-holding purposes leads directly to the policy recommendation of a dual exchange rate system for LDCs: a free market for foreign exchange in the current account while currency substitution in the form of purchasing and holding foreign-currency assets is prohibited or else it is discouraged with a black-market exchange-rate premium.

We recognize that for mainstream economists who view exchange rate controls as one of the policies that lead to economic stagnation this conclusion is hard to swallow. We take no exception to the position that the main advantage of a flexible exchange rate regime is that it allows for monetary independence (McKinnon, 1982; Darrat *et al*., 1996). But this is no longer true in the presence of currency substitution that makes devaluation as an instrument of adjustment lose its bite. Moreover, restrictions in purchasing and holding hard-currency assets have had a long and effective service record as instruments of monetary policy. They were rightly abolished in some countries because they were no longer needed; in the rest they were also rightly abolished because they were onerous. But if one takes the findings of this study seriously, such controls have become once again necessary for a specific set of developing countries.

As a final caveat it should be mentioned that “good governance,” which is captured by the “policy index” in Table 3.4, is a necessary factor for benign interventions to work well. The importance of the appropriate institutional infrastructure, including good governance, for restoring symmetry in the

outcomes of globalization has already been emphasized fittingly in other papers in this volume.

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Table 3.1. Required Annual Income Growth Rate (1990-2015) for Exit from Poverty by 2015 of an Average Poor Person in 1990 (Country per Capita Income in 1990 > 2,000 US$)

County	Per capita income in 1990	(A) Average annual per capita growth rate, 1960-90	(B) Required growth rate	If (B) > (A) = 1, otherwise = 0
Algeria	2,604.88	0.012	0.016	1
Belarus	4,367.79	0.022	0.005	0
Botswana	4,739.68	0.071	0.019	0
Brazil	5,353.13	0.027	0.014	0
Chile	4,810.04	0.017	0.009	0
Colombia	4,714.73	0.021	0.012	0
Costa Rica	5,302.26	0.014	0.020	1
Dominican Republic	3,247.68	0.022	0.009	0
Egypt, Arab Rep.	2,416.04	0.032	0.006	0
El Salvador	2,969.62	0.002	0.029	1
Estonia	8,213.16	0.010	0.014	1
Guatemala	2,847.20	0.012	0.029	1
Honduras	2,062.22	0.009	0.025	1
Jamaica	3,294.35	0.008	0.011	1
Jordan	3,218.61	0.097	0.010	0
Kazakhstan	4,700.79	-0.012	0.002	1
Kyrgyz Republic	2,010.47	0.033	0.026	0
Lithuania	9,134.65	0.051	0.009	0
Mexico	6,197.49	0.021	0.017	0
Moldova	3,089.15	-0.014	0.008	1
Morocco	2,780.90	0.020	0.008	0
Namibia	4,292.65	-0.014	0.021	1
Panama	3,708.73	0.018	0.025	1
Paraguay	3,871.28	0.023	0.010	0
Peru	3,203.10	0.001	0.012	1
Philippines	3,210.93	0.014	0.010	0
Poland	6,083.60	..	0.017	0
Romania	5,412.85	0.017	0.022	1
Russian Federation	8,593.73	0.036	0.012	0
South Africa	8,266.22	0.012	0.007	0
Thailand	3,697.77	0.047	0.010	0
Trinidad and Tobago	5,810.69	0.025	0.013	0
Tunisia	3,755.41	0.029	0.012	0
Turkey	4,332.63	0.021	0.011	0
Turkmenistan	5,370.00	-0.002	0.013	1
Ukraine	7,046.31	-0.004	0.014	1
Uruguay	9,557.52	0.007	0.023	1
Uzbekistan	..	0.015	0.006	0
Venezuela, RB	4,812.02	-0.003	0.010	1
Zimbabwe	2,249.26	0.013	0.015	1

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Table 3.2. Required Annual Income Growth Rate (1990-2015) for Exit from Poverty by 2015 of an Average Poor Person in 1990 (Grouped by per Capita Income in 1990)

County	Per capita income in 1990	(A) Average annual per capita growth rate, 1960-90	(B) Required growth rate	if (B) > (A) = 1, otherwise = 0
1,000 US$ ≦Per capita income in 1990 ≦2,000 US$				
Bolivia	1,740.00	0.000	0.009	1
Central African Republic	1,031.58	-0.007	0.037	1
China	1,331.66	0.037	0.014	0
Cote d'Ivoire	1,497.13	0.009	0.008	0
Ecuador	1,445.87	0.021	0.019	0
Gambia, The	1,502.09	0.008	0.023	1
Ghana	1,336.06	-0.008	0.010	1
India	1,397.11	0.018	0.014	0
Indonesia	1,875.25	0.037	0.008	0
Lesotho	1,055.13	0.031	0.024	0
Mauritania	1,168.82	0.013	0.023	1
Mongolia	1,606.72	0.023	0.010	0
Nicaragua	1,721.24	-0.011	0.022	1
Pakistan	1,380.35	0.029	0.013	0
Senegal	1,154.82	-0.005	0.023	1
Sri Lanka	1,956.03	0.024	0.007	0
Country per Capita Income in 1990 ≦1,000 US$				
Bangladesh	970.12	0.008	0.011	1
Burkina Faso	631.16	0.009	0.022	1
Ethiopia	479.69	-0.016	0.012	1
Kenya	940.59	0.018	0.019	1
Madagascar	783.78	-0.011	0.021	1
Mali	561.13	0.001	0.020	1
Nepal	846.96	0.007	0.012	1
Niger	732.83	-0.018	0.028	1
Sierra Leone	835.44	0.008	0.051	1
Tanzania	436.87	0.014	0.028	1
Uganda	750.47	0.007	0.018	1
Zambia	805.57	-0.010	0.031	1

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Table 3.3. Growth and Poverty Reduction, 1990-2015

	World	Asia and Pacific	Eastern Europe and Central Asia	Latin America and Caribbean	Middle East and North Africa	South Asia	Sub-Sahara Africa
Sawada's exit-time required annual per capita economic growth rate to achieve target #1 (%)[a]	1.5	1.3	4.1	1.8	0.9	1.3	2.3
Besley and Burgess's required annual per capita economic growth rate to achieve target #1 (%)[b]	3.8	2.7	2.4	3.8	3.8	4.7	5.6
Average annual per capita growth rate, 1960-1990 (%)[b]	1.7	3.3	2.0	1.3	4.3	1.9	0.2

[a] Adapted from Sawada (2004).

[b] Adapted from Besley and Burgess (2003: Table 2, p. 8).

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Table 3.4. Growth and Exchange Rate Misalignments

	(1)	(2)	(3)	(4)
Per capita real GDP (in 1,000,000 US$)	-0.450	-0.420	-0.249	-0.294
	(1.52)	(1.30)	(0.78)	(0.92)
Measure of chronic exchange rate misalignments	-0.001	-0.0019	-0.002	-0.002
	(0.65)	(0.71)	(0.79)	(0.83)
Measure of chronic exchange rate misalignments ×openness		-0.015	-0.013	-0.013
		(5.12)***	(4.38)***	(4.29)***
Policy index (in 1,000)			0.028	0.026
			(1.91)*	(1.63)
Government share of per capita real GDP				-0.0001
				(0.54)
Africa	-0.030	-0.031	-0.026	-0.025
	(5.65)***	(5.53)	(4.38)***	(4.29)***
Latin America	-0.017	-0.019	-0.016	-0.016
	(3.61)***	(3.89)***	(3.16)***	(3.13)***
East Asia	0.017	0.018	0.019	0.019
	(3.61)***	(3.06)***	(2.59)**	(2.52)**
Constant	0.027	0.026	0.025	0.027
	(5.86)***	(4.85)***	(4.47)***	(4.11)***
No. observations	86	73	63	63
R-squared	0.415	0.531	0.513	0.517

* Significant at the 10-percent level; ** Significant at the 5-percent level; *** Significant at the 1-percent level.

Notes: The dependent variable is annual growth rate (years 1980-2000) of real per capita GDP. We present t-statistics in parentheses, where White's heteroskedasticity consistent standard errors are employed