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Financial Crisis in Asia: Its Genesis, Severity and Impact on Poverty and Hunger*

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Summary

Building on the recent literature on finance, growth and hunger, we have examined the experience of Asian countries over the last five decades, using dynamic panel models. Although the results are mixed, depending on the specification and variables used, there is some evidence favouring a positive role of finance in growth of GDP and agricultural value added. While financial development reduces income inequality, the effects on hunger are not so robust. Although microfinance has considerable potential for ameliorating deprivation, the contraction of credit and risk aversion of investors, together with a faltering global recovery, underlie gloomy prospects for the poor in Asia.

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Financial Crisis in Asia Region: Its Genesis, Severity and Impact on Poverty and Hunger

I.   Introduction

There has been a surge of studies focusing on the recent financial crisis that erupted in USA and has rapidly spread to the rest of the world (e.g., IMF, 2008, World Bank, 2008a, ADB, 2008, Arrow, 2008, Krugman, 2008, Phelps, 2008). Indeed, this crisis has turned into a crisis of confidence. Despite extensive interventions by governments and monetary authorities, the supply of credit has shrunk, stock markets have recorded dramatic losses, and a major downturn in the global economy has occurred. Commodity prices have eased from recent peaks and large exchange rate realignments have occurred (ADB, 2008, 2010, IMF, 2008, 2010).

The roots of this crisis lay in the subprime mortgage market in USA. Expansionary monetary policy kept the interest rate low for some years and encouraged borrowing for real estate. Financial institutions offered loans to people who were not capable of repaying them-the subprime borrowers. Such loans were bundled up and turned into investments through securitization. These mortgage securities were also combined with other securities designed to reduce the risk such as collateralized debt obligations (CDOs) and used to entice more investors. Financial institutions also entered into intricate financial contracts known as credit derivatives or credit default swaps in order to protect against default. An oversupply of homes and rising interest rates caused a decline in housing prices and home loans. Rising defaults, and declining house prices and lending resulted in losses to those institutions that held and sold mortgage-backed securities and credit derivatives. Subsequently, the crisis spread to non-housing businesses and larger financial institutions not directly connected with mortgage lending. Many had invested in assets derived from mortgage-based securities. Interbank lending rates rose to reflect higher risk in the financial sector. As interbank lending

contracted and trust eroded, the credit market failure unravelled. Overseas financial institutions linked to these markets were sucked into the financial turmoil of USA, UK and the rest of Europe. Investors started withdrawing from stock markets resulting in huge falls in valuation. These falls were recorded in both high-income and emerging markets, given trade and asset linkages. As the contagion spread, further, predictions of a global recession gained plausibility.

This crisis followed on the heels of the food price crisis that caused riots in many developing countries (FAO, 2009). In fact, as emphasised by Rodrik (2010), developing countries have been prone to a series of crises -some financial and others of a different kind- with devastating consequences for the poor. He observes "For too many of these countries, economic growth in the last two decades relied on a combination of two factors: a natural rebound from previous financial crises (as in Latin America) or political conflicts and civil war (as in Africa), and high commodity prices. Neither can be relied on for the productive transformation that developing countries need" (Rodrik, 2010, no page number).

The main objective of the present study is to deepen our understanding of the severity of the financial crisis and its implications for growth and poverty reduction in selected Asian countries. While our focus is on the recent financial crisis, our analysis yields insights into the channels through which the effects of financial crisis on growth and poverty are transmitted in developing countries. In fact, there is a body of empirical literature to assess the effects of financial crises on growth and/or poverty, using micro data sets. Most of these studies have confirmed negative impacts of crises on growth and poverty reduction (e.g., the Latin American Crisis (Oscar, 1998), the Asian Financial Crisis (Nixson and Walters, 1999; Mazumdar and Horton, 2000) the Russian Crisis (Lokshin and Ravallion, 2000)).[1] But there have been few studies to assess the effect of a crisis on growth and poverty or nutrition using cross-country data over long periods.

The financial crisis which began unravelling in 2007 is distinct because it originated in the crisis of Banking System of the United States, not in developing countries. Its effects were severe and worldwide, as it raised the spectre of the Great Depression in the 1930s (IMF, 2010). To better understand the implication of the recent financial crisis for economic growth and poverty, the present study carries out cross-country regression analysis for a sample of Asian countries.

The scheme is as follows. In the next section, an attempt is made to link finance and the real economy, followed by a brief exposition of the dynamics of the financial crisis. Section III gives an account of how the crisis unfolded in Asia. Section IV is devoted to a review of the literature on finance, growth and poverty. Section V reviews the impact of financial crisis on microfinance given the increasingly important role of the latter in reducing poverty in Asian countries. In the absence of firm empirical evidence, a distillation of recent surveys of MFIs and other evidence is given. The data, model specifications and econometric results are discussed in Sections VI and VII, primarily to illustrate how credit influences growth and poverty reduction. An extension throws new light on various mechanisms that link contraction of credit to lowering of crop yields and aggravation of poverty in a sample of Asian countries. In Section VIII, some concluding observations are made from a broad policy perspective.

II. Finance and Real Economy

While this linkage remains contentious, various studies have focused on the following. The first is through a financial accelerator that amplifies the effects of financial cycles on the real economy, through its effects on the value of collateral and thereby expansion of credit. Another is through lenders' balance sheets and the relationship between bank capital and aggregate credit. When bank capital is eroded, banks become reluctant to lend and are forced

to deleverage. A third but overlapping with the first linkage is the variation in the role of the financial accelerator with the financial system (arm's length financing as opposed to relationship banking). In other words, households and producers can substitute away from banks to markets (IMF, 2008).

The dynamics of the financial crisis could be delineated as follows: the procyclical behaviour of bank leverage – changes during upturns and downturns is crucial to understanding how banking stress translates into a reduced credit supply, a higher cost of capital, and a flattening of economic activity. More specifically, the key issue is: when banks overextend their balance sheets during booms, on the back of higher asset values and lower perceived risks, financial imbalances build up, economic activity is further boosted that in turn also further boosts asset values, reduces perceived risk, fostering further lending and economic expansion. Under such conditions, a financial shock that either increases risks or reduces yields prompts a cycle of deleveraging, with a sharp reduction in bank lending as bank capital falls, leading to an economic slowdown that feeds into a further reduction in credit supply. The procyclicality of bank leverage is greater when banks are more exposed to fluctuations in the market value of assets-for example, through their holdings of securities and their repurchase. IMF (2008) confirms that commercial banks tend to be more procyclical when operating in more arm's length financial systems, where a greater share of intermediation occurs through financial markets rather than through traditional relationship-based (and bank dominated) activities. Thus, more arm's length financial systems are more prone to financial crises. In fact, lack of information about the value and risk of many securitised products, and about the losses subsequently associated with these products, amplified the present crisis.

The channels through which the financial crisis impacted on growth and poverty in developing countries are diverse (Lin and Martin, 2010). These include changes in capital

flows, commodity prices, remittances, interest rates, risk premia, and trade opportunities. The channels through which rural poor were impacted are even more complex, with linkages involving commodity prices, wage rates and employment likely to be particularly important.

To elaborate selectively, the effects of changes in commodity prices are complex. Declines in the prices of staple foods typically reduce poverty in developing countries, as the poor spend a large share of their incomes on these foods, and many poor in rural areas including small farmers are net buyers of these foods (Ivanic and Martin, 2008). Declines in the prices of some higher income-elastic foods such as dairy products, however, increase poverty by lowering the incomes of small producers who produce and sell these commodities but are unable to afford them. Declines in the prices of cash crops (e.g. cotton, coffee, rubber) are, however, more likely to increase poverty as farmers in developing countries are net sellers of these goods and the poor spend only small shares of their incomes on them.

A related observation is that income reductions increase not just poverty but also nutritional deprivation. Through a lower demand for calories, proteins and fats, and consequently lower intake, productivity is lowered and employment in rural labour markets is hampered. Thus nutrition-poverty traps emerge (Dasgupta and Ray, 1986, and Jha et al. 2009). Evidence also suggests that large sections of rural poor are also more vulnerable to shocks and crises than the non-poor, and shocks propel them into long spells of poverty (Gaiha and Imai, 2009, Dercon and Christiansen, 2010). Finally, as the poor are more credit-constrained, contraction of MFIs' loan portfolio and more stringent selection criteria are likely to hurt the poor more.[2]

III.   Financial Crisis in Asia

How did the Crisis Unfold in Asia?

The crisis manifested in emerging Asia in early 2008, and was expected to worsen in response to slackening demand from advanced economies and growing tensions in regional financial markets. More recent assessments, however, point to a strong recovery led by China, India and other emerging Asian economies (ADB, 2010, IMF, 2010). A selective review of the evidence is given below.

Growth in China eased to $10^{1/2}$ per cent in the first half of 2008, from 12 per cent in 2007, partly because of slowing exports. Investment and consumption, however, maintained their momentum. On the other hand, in India, growth in the second quarter slowed to 8 per cent, on the back of weakening investment, while private consumption and exports held up better than feared, with signs of the latter registering a sharp drop in October, 2008.[3] In fact, exports fell sharply in other Asian countries too, including South Korea, China, Japan and Taiwan.[4] In the so-called NIEs and ASEAN economies, activity decelerated. Domestic demand softened as a result of surge in food and fuel prices, and investment plans were scaled down. Vietnam, for example, underwent a sharp correction as the demand boom caused by large capital inflows eroded.

Financial markets weakened due to a pessimistic global outlook and investor risk appetite declined following the September turbulence. Equity markets that had a bull run during 2005-07-prices, for instance, more than quadrupling in China and tripling in India- plummeted. In some countries, borrowing spreads shot up for banks relying on wholesale funding.

Current accounts began to show strains as well, largely due to rising import bills for commodities and slowing export growth, while capital account and exchange rate developments varied. Capital inflows to China remained strong, as reflected in the continuing surge of foreign reserves; capital flows to other countries in the region became more volatile, particularly to those running large external deficits. Consequently, their currencies came under pressure, prompting central banks to intervene (e.g. India, Pakistan

and Vietnam). While the Chinese renmimbi and the ASEAN currencies appreciated, the South Asian and NIE's currencies weakened.

Headline CPI inflation soared in many countries in the first half of 2008, with slight reductions in a few. In China, headline CPI inflation declined from its peak of $8^{1/2}$ per cent in April, 2008, as food supply improved. In India, CPI inflation jumped to 9 per cent in August, 2008.

Prospects

Contrary to apprehensions, domestic –demand driven economies of China, India and Indonesia led to a slow but faltering global economic recovery. Indeed, the short-term outlook for Asia remains positive, with growth expected to settle at more sustainable but still high levels. Ample global liquidity, on the one hand, and the relatively robust growth and low public debt in Asia, on the other hand, are likely to fuel capital flows to this region. Reflecting the slowing of export growth and strong domestic demand, Asia's current account surplus is expected to fall to 3 per cent of the regional GDP in 2010 and 2011, from about 5 per cent in 2007, making a modest contribution to reduction of global imbalances.

With external demand from advanced economies unlikely to return to pre-crisis levels in the near future, Asia will need stronger domestic demand to maintain robust growth. The normalisation of policy measures in Asia, therefore, must be accompanied by continued measures to reinforce private domestic consumption and investment (IMF, 2010).

IV.   Review of Cross-Country Studies on Finance, Growth and Poverty

There is a vast literature on this theme with valuable insights from cross-country data over time. We will concentrate largely on two (Beck et al. 2007, and Claessens and Feijen 2006), with brief comments on a few other important contributions. Beck et al. (2007) examine the

effects of financial development on poverty through two channels: aggregate growth, and changes in the distribution of income. Instead of examining the finance-growth link, they offer an assessment of the impact of financial development on changes in the distribution of income and changes in both relative and absolute poverty. Specifically, the variables considered are (i) the Gini coefficient of income distribution; (ii) income share of the poor, measured as the income share of the poorest quintile relative to total national income; and (iii) the share of the population living on less than $1 per day. Using GMM panel estimator for dynamic models, greater financial development is associated with poverty reduction. In fact, 60 per cent of the impact of financial development on the poorest quintile works through aggregate growth and 40 per cent through reduction in income inequality[5].

Claessens and Feijen (2006) identify specific channels through which financial development impacts on undernourishment[6]. Using data from 1980-2003 and relying on IV estimation for robustness, they show that private credit has a large negative effect on undernourishment through higher agricultural productivity in general and higher livestock, crop and cereal yields in particular. To a large extent higher agricultural productivity due to financial development is mediated by greater fertilizer and tractor use. Besides, the distribution of banking outlets makes a difference.

V.   Impact of Financial Crisis on Microfinance

Microfinance allows poor people to protect, diversify and increase sources of their income. Microfinance also mitigates vulnerability to extreme fluctuations that are a feature of their daily existence. Loans, savings, and insurance smooth out income fluctuations and stabilize consumption levels even during lean periods (Littlefield et al. 2003).

There is little hard evidence on the impact of the current financial turmoil on microfinance. To the extent that there is contraction of credit, and the concomitant reduction in rural credit,

the implications for the rural poor are likely to be serious. Even though interest rates have fallen to stimulate demand for credit, there is a strong reluctance to lend in an environment lacking trust. So, effectively, contraction of credit implies higher interest rates and shorter maturities. If these observations have general validity, it follows that the demand for credit would be reduced especially in the target groups of MFIs, and poverty may increase through financial constraints on raising agricultural productivity. Vulnerability of low income households may also get aggravated because of their failure to smooth consumption. On the other hand, the loan portfolio of MFIs may shift in favour of wealthier clients. Moreover, the financial viability may erode because of moral hazard and adverse selection. A major priority therefore is to inject more capital into the financial system-especially MFIs. That these concerns have emerged as major priorities is reflected in a recent survey conducted by the Microcredit Summit Campaign, reported in *Micro-credit Summit e-news*, vol. 6, issue 2: October, 2008). A summary of the responses to the questions asked is given below.

The concerns stem from a tightening money market, higher cost of funds, and drying up of foreign funds. Higher rates of interest are resulting in repayment difficulties and reduction in borrowing. Consumption of food is reduced in the event incomes cannot be supplemented. MFIs are being forced to be more cost-effective or else are likely to be wiped out. What is indeed most worrying is the pessimism of investors in microfinance. Few, if any, concrete strategies are identified to deal with the financial turmoil.

A more recent survey (CSFI, 2009), based on 430 respondents from 82 countries, including observers, regulators, investors and practitioners, throws new light on many of these issues. Going by the aggregate of responses, the concerns about credit risk and too little funding moved centre-stage. The fact that much funding is in non-local currency has added to foreign currency risk owing to volatility in the foreign exchange markets. All these risks taken together are reflected in more serious concerns about erosion of profitability. "Many

respondents saw a vicious circle here: the recession creating a worse business environment, leading to mounting delinquencies and shrinking markets, leading to declining profitability, loss of investor confidence, and cutbacks in funding , and so on" (CSFI, 2009, p.7).

Associated with the vulnerability of MFIs is the larger risk of mission drift and abandonment of their social objectives. There was a mixed response to how well prepared were the MFIs to handle these risks. Barely 5 per cent of the respondents acknowledged that they were well prepared and 13 per cent confessed that they were ill-prepared. The rest gave a mixed response. Among the Asian respondents, however, the concerns about these risks were more muted: liquidity and credit risks figured in their top ten, but not in the concentrated form of other regional respondents. There were also concerns about mission drift and political interference.

In sum, even though perceptions delineated here may well be more negative than warranted by the ground reality, it would be a mistake to set them aside completely.

Supplementary evidence comes from simulations in Imai et al (2010b). The results simulate the effects of hypothetical reductions in gross loan portfolio (GLP) of MFIs, GDP per capita and share of domestic credit in GDP on the head-count index of poverty. Although the overall rise in poverty is low (about 3.45 per cent in the mild recession scenario), it is by no means negligible. It must be emphasised, however, that the cumulative effect of the global slowdown reflected in sluggishness of investment on poverty may well be larger.

VI.   Data and Models for Finance, Growth and Hunger in Asia

Here the objective is to analyse the relationships between finance, growth and hunger in selected Asian countries. The analysis is based on a panel of 9 countries over the period 1960 to 2006, based on a dynamic panel estimation strategy that builds upon the recent literature reviewed above. First, a description of the data used is given. This is followed by an

exposition of the models estimated. In a subsequent section, the results are discussed, followed by some concluding observations from a broad policy perspective.

Data

All the models are estimated with the finance, poverty and inequality data at the country level. The data sets created are based on World Bank Development Indicators (WDI) 2008 (World Bank, 2008b), FAO-STAT (FAO, 2008), World Bank's Finance Data (based on Beck et al. (2000), The UNU-WIDER World Income Inequality Database (WIID) (UNU-WIDER, 2008), and Barro-Lee's (2000) data on education.

One of the data constraints in addressing our research questions is that while annual data on most of the key economic and financial variables are available for 9 countries (except Vietnam for which most of the variables start from 1985-1990) in 1960-2006, the data on inequality and poverty are available only for few years, when a national income or expenditure survey or a census were carried out. Hence we use annual panel data for 8 or 9 countries to examine the links between financial growth and economic or agricultural growth in the period 1960-2006, with a few missing observations. We have specified a dynamic panel data model, drawing upon Blundell and Bond (1998) - an extension of Arellano and Bond (1991). To investigate the relationship between finance and inequality or poverty, we use the panel data aggregated at 5- year intervals since 1960 (along the lines of Barro and Lee (2000) or the empirical macroeconomics literature to test growth theories). For all countries except Vietnam, inequality data from UNU-WIDER's WIID and undernutrition data from WDI (Classens and Feijen, 2006) are available roughly once or sometimes twice in 5 year periods. If more than one estimate is available in one period, the average is used[7]. These poverty and inequality data are matched with the 5- year averages of finance and economic variables. One of the advantages of applying two different time schedules is that we can use

the predicted values of finance data based on annual panel data for the 5 year-panel, whereby inequality or undernourishment is estimated by the aggregated finance data based on predictions on an annual basis. This approach would at least partially address the issue of endogeneity of finance in the inequality or undernourishment equation.

Appendix 1 summarises the definitions of variables, descriptive statistics and data sources. We take three different measures of finance-(i) logarithm of the share of private credit in GDP; (ii) log of the share of private credit through (formal) money deposit banks as a share of GDP (the narrow definition of private credit), and (iii) log of Financial System Deposits in GDP. For inequality, we use the income Gini coefficient. Poverty is treated as synonymous with the prevalence of undernourishment, as in Classens and Feijen (2006). Other variables used in the analysis are defined in the appendix.

Model Specifications

We estimate four dynamic models in which the dependent variable, (a) GDP per capita or agricultural value added per capita, (b) finance, (c) inequality or (d) undernourishment is separately estimated. A variable on finance is used as one of the explanatory variables for (a), (c) and (d).

(a) Model for GDP or Agricultural Value Added

Following Guariglia and Poncet (2008), we specify the following relation:

$$\Delta Y_{it} = \alpha + \beta Finance_{it} + \gamma\, Control_{it} + \eta_i + \lambda_t + \varepsilon_{it} \qquad (1)$$

where i and t denote country and year, respectively; ΔY_{it} is GDP per capita growth and Finance $_{it}$ is a proxy variable for finance, Control $_{it}$ is a vector of control variables, η_i is the country specific unobservable effect (e.g. social and cultural factors), λ_t is the time effect and ε_{it} is an error term, independent, and identically distributed (or *i.i.d.*). The log of lagged per capita GDP is included in Control $_{it}$ to control for convergence. Other controls include log of

share of population with more than primary education, log of government expenditure in GDP (to measure size of government), log of CPI (Consumer Price Index), and log of trade as a share of GDP (measure of openness). In a variant, the dependent variable is agricultural value added per capita.

A version of equation (1) can be written as

$$Y_{it} - Y_{it-1} = (\alpha' - 1)Y_{it-1} + \beta'X_{it} + \eta_i + \lambda_t + \varepsilon_{it}$$

with the log of lagged per capita GDP on the right hand side and the rest of the explanatory variables as a vector, X_{it}. Estimating (1) (with log of lagged per capita GDP) is thus equivalent to estimating the following standard dynamic panel data model:

$$Y_{it} = \alpha'Y_{it-1} + \beta'X_{it} + \eta_i + \lambda_t + \varepsilon_{it} \qquad (2)$$

GMM panel estimator relies on first-differencing the estimating equation (and thus country fixed effects will be eliminated) and appropriate lags of the right side variables as instruments.

$$Y_{it} - Y_{it-1} = \alpha''(Y_{it-1} - Y_{it-2}) + \beta''(X_{it} - X_{it-1}) + (\lambda_t - \lambda_{t-1}) + (\varepsilon_{it} - \varepsilon_{it-1}) \qquad (3)[8]$$

Two issues have to be resolved: one is endogeneity of the regressors and the second is the correlation between $(Y_{it-1} - Y_{it-2})$ and $(\varepsilon_{it} - \varepsilon_{it-1})$ (e.g. see Baltagi, 2005, Chapter 8). Assuming that ε_{it} is not serially correlated and that the regressors in X_{it} are weakly exogenous, the generalized method-of-moments (GMM) first difference estimator (e.g. Arellano and Bond, 1991) can be used. Alternatively, we could use the lagged differences of all explanatory variables as instruments for the level equation and combine the difference equation (3) and the level equation (2) in a system whereby the panel estimators use instrument variables based on previous realisations of the explanatory variables as the internal instruments, using the Blundell-Bond (1998) system GMM estimator based on additional moment conditions[9]. Such a system gives consistent results under the assumptions that there is no second order serial correlation and the instruments are uncorrelated with the

error terms. Validity of instruments is tested by Sargan's J test and the second order serial correlation of the residuals. The Blundell-Bond (1998) system GMM estimator is used in the present study. We use the heteroscedasticity-robust variance-covariance estimator for all cases.

The Blundell-Bond (1998) system GMM estimator is useful to address the problem of potentially endogenous regressors (e.g. Finance in equation (1)). In the system equation, endogenous variables can be treated similarly to lagged dependent variables. The second lagged levels of endogenous variables could be specified as instruments for difference equation. The first lagged differences of those variables could also be used as instruments for the level equation in the system.

We try the cases (i) where the endogeneity is not taken into account, and (ii) where some endogenous variables (after instrumenting) are included. In this model, we try the cases where finance and trade share are treated as endogenous variables.

(b)   Model for Financial Development

While there is a huge empirical literature on the determinants of finance, we use a simple specification, following Baltagi et al.'s (2009) where finance is estimated by a dynamic panel model in which trade openness and financial openness are used as explanatory variables.

$$Finance_{it} = \gamma Finance_{it-1} + \delta Openness_{it} + \eta'_i + \lambda'_t + \varepsilon'_{it} \qquad (4)$$

This is estimated by the Blundell-Bond system GMM estimator.

(c)   Model for Inequality

Likewise, inequality is estimated by a dynamic panel model using the Blundell-Bond system GMM estimator applied to 5- year panel data.

$$Inequality_{it} = \theta Inequality_{it-1} + \vartheta Finance_{it} + \mu W_{it} + \eta''_i + \lambda''_t + \varepsilon''_{it} \qquad (5)$$

The dependent variable is the Gini index of income. $Finance_{it}$ is log of private credit (value of credit by financial intermediaries to the private sector) divided by GDP, or log of Financial System Deposits in GDP. W_{it}, a vector of control variables including log of initial years of schooling, log of growth rate of the GDP deflator, and log of trade share. Finance and trade share are treated as endogenous variables in some specifications.

(d)   Model for Undernourishment

In the regression of prevalence of undernourishment, we use the same specification as for the inequality equation except that we include log of population growth and log of share of working age population (that is, share of the age group between 15-65, or active population in the total population) in W_{it}.

VII.   Econometric Results

The results of the models specified above are discussed here. Table 1 reports 6 cases; Cases 1 and 2 for the broad definition of private credit, Cases 3 and 4 for the narrow definition of private credit through banks, and Cases 5 and 6 for financial system deposits. Cases 2, 4, and 6 are those in which finance and trade openness are treated as endogenous in the system. These six cases (based on three definitions of finance and whether some of the explanatory variables are endogenized in the system) will be tried for all the other models.

(Table 1 to be inserted around here)

Somewhat surprisingly, the coefficient estimate of finance is *negative* and significant in Case 1, which is contradictory to the predictions of positive role of financial development on economic growth (e.g., through financial intermediation or facilitation of industrial or agricultural investment). However, it ceases to be significant once it is endogenized in the

system. Finance, defined as financial system deposits, is, however, positive and significant in Cases 5 and 6.

As a sensitivity test, we have run the regression with the same specification by dropping Malaysia[10]. As shown in the last panel, in Case 2 where finance is treated as an endogenous variable, it has a significant *positive* coefficient (at the 10% level), while the coefficient estimate in Case 1 ceases to be significant. The coefficient estimates are not significant in Case 3 or Case 4. However, they are highly significant in Case 5 and Case 6, as in the corresponding case *with* Malaysia. Incidentally, in Case 6, finance has a significant positive coefficient with a much higher z value. The rest of the coefficient estimates are more or less the same in the cases without Malaysia and are, therefore, not shown here.

Education, defined as the share of the population with primary education or above, is positively associated with GDP per capita. Also, size of government measured by share of government spending of GDP leads to higher GDP per capita. The coefficient estimate of CPI is positive in all cases except Case 1. Trade share is positive and significant regardless of whether it is endogenized in the system. Tests for the second order serial correlation of the residuals (m2) show that there is no second order serial correlation except in Case 1. The results for the Sargan test validate our specification as over-identifying restrictions are valid for all the cases.

In Table 2, we estimate the determinants of agricultural value added per capita using the same specification. Private credit is negative and significant at the 5% level in Case 2 and at the 10% level in Case 1. However, the coefficient estimate of financial system deposit is positive and highly significant in Cases 5 and 6.

(Table 2 to be inserted around here)

We have carried out again a sensitivity test without Malaysia. The coefficient estimates of finance are still negative in Case 1 to Case 4, but they are no longer significant in any of these cases, which suggests that Malaysia seems to have driven the negative and significant (at the 10% level) coefficients in Cases 1, 2 and 4. Cases 5 and 6 with Malaysia still show a positive and significant coefficient for finance. Thus the evidence on the role of finance in agricultural growth is mixed.

Table 3 contains the results of the finance equation. Cases 1 and 2, and Cases 3 and 4, and Cases 5 and 6 relate to three different finance measures. Two cases are tried for each definition according to whether trade openness is treated as an endogenous variable or not. Higher GDP per capita is significantly associated with financial development (at the 10% level) in all cases except Case 2. This is consistent with Baltagi et al. (2009). However, trade openness is not significant in any of the six cases.

(Table 3 to be inserted around here)

This is in sharp contrast to Baltagi et al. (2009) who found a positive and significant coefficient estimate for both trade openness and financial openness. It is noted, however, that they use data for 31 countries including advanced countries (e.g. US, UK, Japan), middle income countries (e.g. Brazil) and low income countries (e.g. Zimbabwe) for 1980-1996. The use of different data sets would partly explain the differences between the results. The Sargan tests and tests for serial correlations validate our specification.

Tables 4 and 5 report the results based on a dynamic panel data model where the dependent variables are the Gini coefficient and the prevalence of undernourishment. Based on the regression results in Cases 2, 4 and 6 in Table 4, the predicted values of three finance indicators are derived for the entire period on an annual basis. These predicted values are aggregated at 5-year intervals and are used as alternatives to the actual values. The merit of

this approach is that it addresses partially the endogeneity problem of finance. It also increases the number of observations by making out-of-sample forecast if there are some missing observations. 12 cases are tried. Cases 1, 3, ..., 11 (odd numbers) are the cases where endogeneity is not taken into account, while Cases 2, 4, ..., 12 (even numbers) are those where the endogeneity of potentially endogenous variables (e.g. trade openness) is considered. Cases 1 to 4, Cases 5 to 8 and Cases 9 to 12 are for three different measures of finance, broad and narrow definitions of private credit and financial system deposit (each of which is relative to GDP). Cases 3 and 4, Cases 7 and 8 and Cases 11 and 12 are based on predicted finance measures. Only key results are summarized below.

(Tables 4 and 5 to be inserted around here)

In Table 4, the Gini coefficient is the dependent variable in all the cases. A main finding is that the financial development measured by higher levels of deposits is significantly associated with lower inequality as implied by highly significant (at the 1% level) and negative coefficient estimates of finance in Cases 9 to 12. It is noted that the coefficient estimate is lower in absolute terms when the endogeneity is taken into consideration. Signs of coefficient estimates for finance are negative for the other two definitions of finance in Cases 1 to 8 (and significant at the 10% level in Case 1 and Case 7, and non-significant in the rest).

In sum, finance tends to decrease inequality measured by the Gini coefficient. The coefficient estimates for schooling years in the initial year are negative and significant. If the country has higher levels of education in the early period, it tends to have higher Gini because only a section of the educated people captures the benefits. Trade openness is not significant, nor is the GDP deflator. The Sargan tests and tests for serial correlations, which imply that there is no second order serial correlation, validate our specification in all the cases.

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Table 5 focuses on the determinants of undernourishment. A few additional explanatory variables are included for these cases. A main finding is that private credit broadly defined has a significant negative effect on undernourishment (at the 1% level) in Cases 1 to 4, i.e., depending on whether the endogeneity of finance is taken into account, or whether the predicted or the actual values of private credit are used. Subject to these caveats, this suggests that private credit, broadly defined to cover formal and informal banking sectors, plays an important role in reducing hunger. The negative and significant coefficient estimates (at the 10% level) of narrowly defined private credit (formal banking) in Cases 5 and 7 further strengthen the poverty or undernourishment reducing roles of finance. However, some caution is necessary as these coefficients cease to be significant once they are endogenized in Cases 6 and 8. Financial system deposit is not significant in Cases 8 to 12.

On the results of control variables, trade openness is not significant, while population growth is positive and significant in increasing the prevalence of undernourishment, as in Cases 5 to 11. As working age ratio (i.e., share of people in the working age –group) increases, the prevalence of undernourishment tends to decrease. The Sargan tests and tests for serial correlations validate our specification.

In sum, there is support for the view that contraction of credit has adverse effects on the proportion of undernourished. This is broadly consistent with the past empirical literature to identify the negative impact of the financial crisis on poverty using micro data (e.g. Oscar, 1998; Nixson and Walters, 1999; Mazumdar and Horton, 2000; Lokshin and Ravallion, 2000). However, the present study is important as this is one of the first few attempts to examine the link between credit contraction and poverty or undernourishment from a macro perspective using the cross-country data. There are also likely to be indirect effects of GDP and agricultural growth deceleration due to credit contraction consistent with, for example, Imai, et al. (2010c). However, as in some cases, the causality runs both ways between GDP and

finance, disentangling of the direct and indirect effects of finance on undernutrition is not straightforward.

VIII. Concluding Observations

Building on the recent literature on finance, growth and hunger, we have examined the experience of 9 Asian countries over the period 1960-2006 by dynamic panel data models. Although the results are mixed, depending on the specification and variables used, there is some evidence favouring a positive role of finance on growth of GDP and agricultural value added. But there is also evidence of a reverse causality between GDP growth and financial development. In fact, there are a few cases in which the causality runs both ways. In light of this complexity, the results of finance on inequality and hunger require cautious interpretation. Financial development reduces the Gini coefficient of income distribution. Although there is support for the view that financial development reduces hunger, the results are not so robust. Specifically, when the endogeneity of trade and finance is taken into account, the negative effect of financial development on hunger disappears. Whether these results are driven by some outliers or by a complex two-way dynamics between finance and growth needs further examination.

While microfinance has the potential to ameliorate some of the worst forms of deprivation, the contraction of credit in general and risk aversion of investors, together with a looming global recession, underlie gloomy prospects for the poor in this region.

In conclusion, finance, growth and hunger are linked in complex ways. Our conclusion, therefore, of credit contraction and deceleration of growth aggravating hunger is plausible but not so robust.

Notes

1. However, using panel data, Stillman and Thomas (2008) found a weak impact of the Russian crisis on nutritional status.

2. For assessment of poverty alleviation role of microfinance from micro and macro perspectives, see Imai et al. (2010 a) and Imai et al. (2010b).

3. Growth rate of merchandise exports plummeted from 28.9 per cent in 2007 to 13.7 per cent in 2008 (ADB, 2010).

4. *Financial Times* (11 November, 2008) cites evidence of precipitous falls in exports in these countries. China, for example, reported the slowest export growth in four months. South Korea's exports in the first 10 days of November fell 26 per cent from the same period a year earlier. A slowing of the Chinese economy also had a knock-on effect on Taiwan. An exporter of electronic goods, its overall exports fell 8.3 per cent from a year ago. Sales to China and Hong Kong fell about 20 per cent. For an updated account confirming a sharp drop in exports in these countries, see ADB (2010).

5. Honohan (2003) shows that a 10 per cent increase in private credit to GDP reduces poverty by 2.5-3 per cent.

6. Undernourishment is defined as "the condition of people whose dietary energy consumption is continuously below a minimum dietary energy requirement for maintaining a healthy life and carrying out a light physical activity", (FAOSTAT, 2006).

7. There are a few cases where there are no inequality or undernutrition data in a 5-year interval. Because the missing observations would seriously limit the dynamic panel estimation where the lagged dependent variable is used as one of the explanatory variables, we fill these by taking the weighted average of the observations in the pre and post periods. We did not have any cases where missing observations repeat for 2 periods.

8. As an extension, we have implemented the case with the first and second lagged dependent variables in some cases, depending on the results of serial correlation tests and significance of coefficient estimates of the lagged dependent variables.

9. See the application by Guariglia and Poncet (2008) to examine the relation between finance and economic growth in China.

10. We do so because Malaysia is a special case not simply because of its size but also because of its structural characteristics (e.g. small size, and low share of agriculture in GDP).

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Table 1 Results for the Growth Equation (GDP per capita) based on Blundell and Bond (1998) GMM estimation (Dependent Variable: log GDP per capita)

	Whether Endogenous	Case 1 Without endogenous regressors	Case 2 With Endogenous Regressors	Case 3 Without endogenous regressors	Case 4 With endogenous regressors	Case 5 Without Endogenous Regressors	Case 6 With Endogenous Regressors
Dep. Variable		log(GDP pc)	log(GDP pc)	log(GDP pc)	log(GDP pc)	log(GDP pc)	log(GDP pc)
Explanatory Variables							
L.		1.238	1.287	1.289	1.308	1.254	1.275
		(23.55)**	(18.48)**	(19.01)**	(18.19)**	(17.75)**	(15.75)**
L2.		-0.266	-0.311	-0.312	-0.327	-0.279	-0.294
		(4.59)**	(4.32)**	(4.46)**	(4.45)**	(3.81)**	(3.66)**
log(private credit/GDP)	Endogenous (Cases 2, 4 & 6)	**-0.005**	**-0.003**				
		(2.32)*	**(1.20)**				
log(private credit by banks/GDP)	Endogenous (Cases 2, 4 & 6)			**-0.006**	**-0.002**		
				(1.35)	**(0.29)**		
log(financial system deposit/GDP)	Endogenous (Cases 2, 4 & 6)					**0.003**	**0.002**
						(5.18)	**(2.81)**
log(share of population with primary ed. or above	Exogenous	0.018	0.008	0.026	0.014	0.022	0.01
		(1.30)	(1.12)	(2.07)*	(2.92)**	(1.85)	(1.96)
log(government expenditure/GDP)	Exogenous	0.019	0.011	0.012	0.003	0.007	0.002
		(4.18)**	(4.36)**	(2.28)*	(1.34)	(2.50)*	(1.32)
log(CPI)	Exogenous	-0.005	-0.001	0.001	0.004	0.002	0.004
		(1.56)	(0.43)	(0.58)	(3.46)**	(1.06)	(2.20)*
log(Export+Import /GDP)	Endogenous	0.029	0.024	0.019	0.014	0.015	0.013
		(4.24)**	(3.27)**	(3.36)**	(3.03)**	(3.43)**	(2.38)*
Constant		-0.23	-0.066	-0.202	0.017	-0.052	0.064
		(3.02)**	(1.49)	(1.34)	(0.28)	(0.67)	(3.75)**
Observations		294	294	258	258	270	270
Number of Country		8	8	7	7	7	7
Arellano-Bond Test for Serial Correlation (Z value)							
m 2		(-2.10)*	(-2.01)*	(-1.39)	(-1.35)	(-1.44)	(-1.39)
Sargan Test of overidentifying restrictions							
Ho: overidentifying restrictions are valid							
		chi^2(323)=	chi^2(459)=	chi^2(288)=	chi^2(423)=	chi^2(300)=	chi^2(435)=
		345.15	496.1	313.18	429.93	323.97	444.1
Prpb>Chi2		0.19	0.11	0.14	0.4	0.16	0.37

1. Absolute value of z statistics in parentheses
2. * significant at 5%; ** significant at 1% (based on robust estimators)

3. Blundell and Bond (1998) GMM one-step estimator is applied for all the cases.

Without Malaysia							
log(private credit/GDP)	Endogenous	**-0.004**	**0.003**				
		(0.93)	**(1.79)**				
log(private credit by banks/GDP)	Endogenous			**-0.001**	**0.003**		
				(0.23)	**(0.59)**		
log(financial system deposit/GDP)	Endogenous					**0.003**	**0.003**
						(4.65)	**(5.01)**

Table 2 Results for the Growth Equation (Agricultural Value Added per capita) based on Blundell and Bond (1998) GMM estimation (Dependent Variable: log (Agricultural value added per capita))

	Whether endogenous	Case 1 Without Endogenous Regressors	Case 2 With Endogenous Regressors	Case 3 Without endogenous regressors	Case 4 With endogenous regressors	Case 5 Without Endogenous Regressors	Case 6 With endogenous regressors
Dep. Variable		log(Agri VA pc)	log(Agri VA pc)	log(Agri VA pc)	log(Agri VA pc)	log(Agri VA pc)	log(Agri VA pc)
Explanatory Variables							
L.		0.72	0.732	0.719	0.736	0.659	0.688
		(8.23)**	(8.81)**	(9.96)**	(10.91)**	(7.67)**	(8.07)**
L2.		0.244	0.248	0.255	0.25	0.29	0.288
		(3.80)**	(3.42)**	(4.27)**	(4.07)**	(3.89)**	(3.53)**
log(private credit/GDP)	Endogenous (Cases 2, 4 & 6)	**-0.017**	**-0.016**				
		(1.81)	**(2.00)***				
log(private credit by Banks /GDP)	Endogenous (Cases 2, 4 & 6)			**-0.013**	**-0.011**		
				(1.43)	**(1.72)**		
log(financial system deposit/GDP)	Endogenous					**0.006**	**0.003**
						(4.57)	**(2.46)***
log(share of population with primary ed. or above	Exogenous	0.00	0.002	0.006	0.012	0.013	0.012
		(0.02)	(0.27)	(1.04)	(3.04)**	(2.81)**	(2.76)**
log(government expenditure/GDP)	Exogenous	0.007	0.005	-0.002	-0.005	-0.009	-0.008
		(1.28)	(1.78)	(0.62)	(2.64)**	(1.79)	(2.73)**
log(CPI)	Exogenous	-0.001	0.00	0.004	0.005	0.005	0.004
		(0.24)	(0.06)	(1.85)	(3.26)**	(2.79)**	(2.42)*
log(Export+Import/GDP)	Endogenous	0.025	0.02	0.00	0.002	-0.008	-0.002
		(3.22)**	(3.39)**	(0.00)	(0.31)	(1.12)	(0.37)
Constant		0.122	0.053	0.132	0.115	0.41	0.271
		(0.71)	(0.59)	(1.10)	(1.84)	(7.19)**	(4.99)**
Observations		284	284	248	248	260	260
Number of Country		8	8	7	7	7	7
Arellano-Bond Tes for Serial Correlation (Z value)							
m 2		(-1.58)	(-1.53)	(-1.00)	(-0.93)	(-1.42)	(-1.35)
Sargan Test of overidentifying restrictions							
Ho: overidentifying restrictions are valid							
		chi^2(314)=	chi^2(449)=	chi^2(278)=	chi^2(409)=	chi^2(290)=	chi^2(421)=
		345.15	496.1	313.18	429.93	323.97	444.1
Prpb>Chi2		0.19	0.11	0.14	0.4	0.16	0.37

1. Absolute value of z statistics in parentheses

2. * significant at 5%; ** significant at 1% (based on robust estimators)

3. Blundell and Bond (1998) GMM one-step estimator is applied for all the cases.

Without Malaysia							
log(private credit/GDP)	Endogenous	**-0.004**	**-0.005**				
		(1.00)	**(1.35)**				
log(private credit by	Endogenous			**0.001**	**-0.004**		

banks/GDP)				(0.24)	(1.26)		
log(financial system	Endogenous					0.004	0.004
deposit/GDP)						(2.46)*	(2.48)*

Table 3 Results for the Finance Equation based on Blundell and Bond (1998) GMM estimation (Dependent Variable: Finance)

		Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
	Whether endogenous or exogenous	Without endogenous regressors	With endogenous regressors	Without endogenous regressors	With Endogenous Regressors	Without Endogenous Regressors	With endogenous regressors
Dep. Variable		log(private credit/GDP)	log(private credit/GDP)	log(private credit by banks/GDP)	log(private credit by Banks/GDP)	log(financial system deposit/GDP)	log(financial system deposit/GDP)
Explanatory Variables							
L.		1.096	1.114	1.502	1.498	1.017	0.999
		(14.33)**	(14.04)**	(24.03)**	(24.56)**	(44.82)**	(34.64)**
L2.		-0.189	-0.184	-0.571	-0.559	-0.092	-0.077
		(2.51)*	(2.56)*	(8.11)**	(8.11)**	(3.87)**	(2.50)*
log(GDP per capita)	**Endogenous (Cases 2, 4, & 6)**	**0.039**	**0.009**	**0.064**	**0.041**	**0.071**	**0.04**
		(2.63)**	**(0.65)**	**(2.99)****	**(2.80)****	**(1.80)**	**(2.37)***
log(Export+Import/GDP)	**Endogenous (Cases 3, 4, & 6)**	0.025	0.028	-0.008	0.001	0.009	-0.011
		(0.86)	(1.37)	(0.29)	(0.07)	(0.18)	(0.28)
Constant		0.123	0.238	-0.489	-0.324	-0.505	-0.316
		(0.88)	(2.08)*	(3.09)**	(2.91)**	(1.88)	(2.64)**
Observations		319	319	259	259	271	271
Number of Country		9	9	8	8	8	8
Arellano-Bond Tes for Serial Correlation (Z, Probb>z)							
m 2		(-0.53)	(-0.58)	(-2.04)*	(-2.04)*	(-0.95)	(-1.12)
Sargan Test of overidentifying restrictions							
Ho: overidentifying restrictions are valid							
		chi^2(347)=	chi^2(441)=	chi^2(291)=	chi^2(382)=	chi^2(303)=	chi^2(394)=
		383.16	470.4	333.31*	419.25	356.62*	456.33*
Prpb>Chi2		0.09	0.16	0.04	0.09	0.02	0.02

1. Absolute value of z statistics in parentheses

2. * significant at 5%; ** significant at 1% (based on robust estimators)

3. Blundell and Bond (1998) GMM one-step estimator is applied for all the cases.

Table 4 Results for the Inequality Equation based on Blundell and Bond (1998) GMM estimation (Dependent variable: Gini Coefficient)

Dep. Variable	Whether endogenous or exogenous (Cases 2, 4, 6, 8, 10 & 12)	Case 1 Without endogenous regressors Gini Coef.	Case 2 With endogenous Regressors Gini Coef.	Case 3 Without endogenous regressors Gini Coef.	Case 4 With Endogenous Regressors Gini Coef.	Case 5 Without endogenous regressors Gini Coef.	Case 6 With endogenous regressors Gini Coef.	Case 7 Without endogenous regressors Gini Coef.	Case 8 With Endogenous Regressors Gini Coef.	Case 9 Without endogenous regressors Gini Coef.	Case 10 With endogenous regressors Gini Coef.	Case 11 Without endogenous regressors Gini Coef.	Case 12 With endogenous regressors Gini Coef.
Explanatory Variables													
L.		0.451	0.557	0.404	0.571	0.255	0.375	0.244	0.357	0.197	0.316	0.155	0.324
		(2.60)**	(4.14)**	(1.68)	(3.87)**	(1.91)	(2.46)*	(2.12)*	(2.38)*	(1.58)	(2.71)**	(1.13)	(2.19)*
log(schooling years in the initial years)	Exogenous	0.089	0.066	0.101	0.066	0.132	0.117	0.14	0.119	0.128	0.137	0.148	0.133
		(1.97)*	(2.58)**	(2.03)*	(2.62)**	(4.14)**	(5.17)**	(4.76)**	(4.80)**	(3.56)**	(5.11)**	(3.89)**	(4.39)**
log(GDP deflator)	Exogenous	0.018	0.018	0.021	0.015	-0.006	0.001	-0.006	0	-0.008	-0.011	-0.009	-0.006
		(0.74)	(0.94)	(0.85)	(0.84)	(0.37)	(0.05)	(0.40)	(0.03)	(0.64)	(1.09)	(0.63)	(0.51)
log(private credit/GDP)	**Endogenous**	-0.033	-0.023	-	-	-	-	-	-	-	-	-	-
		(1.91)	(1.25)	-	-	-	-	-	-	-	-	-	-
predicted log(private credit/GDP)	**Endogenous**	-	-	-0.046	-0.015	-	-	-	-	-	-	-	-
		-	-	(1.07)	(0.63)	-	-	-	-	-	-	-	-
log(private credit by banks/GDP)	**Endogenous**	-	-	-	-	-0.034	-0.015	-	-	-	-	-	-
		-	-	-	-	(1.33)	(0.83)	-	-	-	-	-	-
predicted log(private credit by banks/GDP)	**Endogenous**	-	-	-	-	-	-	-0.044	-0.02	-	-	-	-
		-	-	-	-	-	-	(1.74)	(0.98)	-	-	-	-
log(financial system deposit/GDP)	**Endogenous**	-	-	-	-	-	-	-	-	-0.029	-0.016	-	-
		-	-	-	-	-	-	-	-	(3.42)**	(5.17)**	-	-
predicted log(financial system deposit/GDP)	**Endogenous**	-	-	-	-	-	-	-	-	-	-	-0.03	-0.02
		-	-	-	-	-	-	-	-	-	-	(2.58)**	(3.64)**
log(Export+Import/GDP)	**Endogenous**	0.07	0.051	0.088	0.04	0.082	0.05	0.092	0.056	0.086	0.043	0.091	0.054
		(1.53)	(1.59)	(1.18)	(0.99)	(0.99)	(1.06)	(1.06)	(1.12)	(1.01)	(0.99)	(0.95)	(1.16)
Constant		2.082	1.658	2.295	1.573	2.67	2.229	2.699	2.292	2.891	2.447	3.046	2.417
		(2.98)**	(2.95)**	(2.19)*	(2.47)*	(5.18)**	(3.90)**	(6.01)**	(4.11)**	(5.77)**	(5.58)**	(5.63)**	(4.36)**
Observations		57	57	56	56	45	45	44	44	48	48	46	46
Number of Country		8	8	8	8	7	7	7	7	7	7	7	7
Arellano-Bond Tes for Serial Correlation (Z, Probb>z)													
m 2		(1.43)	(1.45)	(1.43)	(1.44)	(0.12)	(0.04)	(-0.32)	(-0.42)	(0.46)	(0.47)	(0.04)	(-0.09)
Sargan Test of overidentifying restrictions Ho: overidentifying restrictions are valid		chi²(37)= 37.61	chi²(66)= 59.88	chi²(37)= 41.83	chi²(65)= 58.07	chi²(36)= 45.04	chi²(56)= 59.35	chi²(35)= 46.9	chi²(55)= 62.75	chi²(36)= 40.53	chi²(58)= 56.31	chi²(35)= 46.28	chi²(57)= 62.25
Prpb>Chi2		0.35	0.69	0.27	0.72	0.14	0.35	0.09	0.22	0.28	0.54	0.096	0.29

1. Absolute value of z statistics in parentheses. 2. * significant at 5%; ** significant at 1% (based on robust estimators) 3. Blundell and Bond (1998) GMM one-step estimator is applied for all the cases.

Table 5 Results for the Undernourishment Equation based on Blundell and Bond (1998) GMM estimation (Dependent variable: share of the undernourished population in the total)

Dep. Variable	Whether endogenous or exogenous (Cases 2, 4, 6, 8, 10 & 12)	Case 1 Without Endogenous Regressors	Case 2 With endogenous regressors	Case 3 Without endogenous regressors	Case 4 With Endogenous Regressors	Case 5 Without endogenous regressors	Case 6 With endogenous regressors	Case 7 Without endogenous regressors	Case 8 With endogenous regressors	Case 9 Without endogenous regressors	Case 10 With endogenous regressors	Case 11 Without endogenous regressors	Case 12 With endogenous Regressors
		Undernour ishment	Undernour ishment	Undernour ishment	Undernour ishment	Undernour ishment	Undernour ishment	Undernour ishment	Undernour ishment	Undernour ishment	Undernour ishment	Undernour ishment	Undernour ishment
Explanatory Variables													
L.		0.661	0.93	0.672	0.935	1.016	0.976	1.006	0.969	0.93	0.996	0.925	0.992
		(5.43)**	(22.02)**	(5.27)**	(22.99)**	(7.57)**	(40.15)**	(7.29)**	(40.66)**	(6.48)**	(32.06)**	(6.16)**	(29.70)**
log(schooling years in the initial years)	**Exogenous**	-0.475	0.027	-0.463	0.015	0.248	0.022	0.256	0.013	0.218	0.02	0.23	0.017
		-0.88	-0.35	-0.83	-0.19	-1.11	-0.34	-1.08	-0.18	-1.04	-0.31	-1.09	-0.24
log(GDP deflator)	**Exogenous**	-0.094	-0.104	-0.086	-0.099	-0.075	-0.05	-0.076	-0.053	-0.072	-0.048	-0.073	-0.044
		-1.84	(2.83)**	(2.12)*	(2.91)**	(3.54)**	-1.77	(3.13)**	-1.67	(2.30)*	-1.81	(2.53)*	-1.48
log(private credit/GDP)	**Endogenous**	-0.397	-0.276	-	-	-	-	-	-	-	-	-	-
		(4.88)**	(8.79)**	-	-	-	-	-	-	-	-	-	-
predicted log(private credit/GDP)	**Endogenous**	-	-	-0.415	-0.287	-	-	-	-	-	-	-	-
		-	-	(5.05)**	(6.48)**	-	-	-	-	-	-	-	-
log(private credit by banks/GDP)	**Endogenous**	-	-	-	-	-0.186	-0.078	-	-	-	-	-	-
		-	-	-	-	(2.44)*	-1.01	-	-	-	-	-	-
predicted log(private credit by banks/GDP)	**Endogenous**	-	-	-	-	-	-	-0.193	-0.08	-	-	-	-
		-	-	-	-	-	-	(2.57)*	-1.03	-	-	-	-
log(financial system deposit/GDP)	**Endogenous**	-	-	-	-	-	-	-	-	-0.034	-0.012	-	-
		-	-	-	-	-	-	-	-	-1.02	-1.08	-	-
predicted log(financial system deposit/GDP)	**Endogenous**	-	-	-	-	-	-	-	-	-	-	-0.05	-0.01
		-	-	-	-	-	-	-	-	-	-	-1.25	-0.37
log(Export+Import/GDP)	**Endogenous**	0.471	-0.009	0.479	0.008	-0.106	-0.074	-0.105	-0.077	-0.179	-0.063	-0.171	-0.055
		-1.19	-0.13	-1.18	-0.11	-1.37	-1.19	-1.35	-1.2	-1.92	-1.04	-1.61	-0.79

log(Population Growth)	**Exogenous**	0.702	0.325	0.631	0.302	0.778	0.552	0.746	0.551	0.591	0.446	0.54	0.424
		-0.96	-1.14	-0.91	-1.07	(4.11)**	(3.10)**	(3.98)**	(2.86)**	(2.07)*	-1.74	(2.03)*	-1.56
log (Share of Working Age Population)	**Exogenous**	-0.623	-0.937	-0.593	-0.917	-1.935	-1.065	-1.887	-1.061	-1.417	-0.789	-1.372	-0.737
		-1.4	-1.89	-1.31	-1.82	(3.71)**	(4.68)**	(3.57)**	(4.28)**	(2.34)*	(2.31)*	(2.20)*	(2.07)*
Constant		5.748	2.198	5.489	2.151	1.9	1.678	1.804	1.706	1.738	1.377	1.544	1.323
		-1.49	(2.34)*	-1.48	(2.31)*	(2.06)*	(2.68)**	(2.07)*	(2.51)*	-1.35	-1.63	-1.26	-1.47
Observations		47	47	47	47	38	38	37	37	39	39	38	38
Number of Code		8	8	8	8	7	7	7	7	7	7	7	7
Arellano-Bond Tes for Serial Correlation (Z, Probb>z)													
m 2		-0.37	(-0.16)	-0.55	-0.07	(-1.11)	(-1.23)	(-1.12)	(-1.21)	(-0.99)	(-1.39)	(-1.00)	(-1.44)
Sargan Test of overidentifying restrictions Ho: overidentifying restrictions are valid													
		chi2(18)= 39.10**	chi2(61)= 83.6*	chi2(18)= 37.83**	chi2(61)= 82.65*	chi2(18)= 25.29	chi2(53)= 52.02	chi2(18)= 25.87	chi2(52)= 52.31	chi2(18)= 25.06	chi2(54)= 53.47	chi2(18)= 25.36	chi2(53)= 53.98
Prpb>Chi2		0.003	0.03	0.004	0.03	0.12	0.51	0.103	0.46	0.12	0.49	0.12	0.44

1. Absolute value of z statistics in parentheses. 2. * significant at 5%; ** significant at 1% (based on robust estimators)3. Blundell and Bond (1998) GMM one-step estimator is applied for all the cases.

Appendix 1 Definitions and Descriptive Statistics of the Variables

Annual Panel Data (1960-2006) for 9 countries

Variable	Definition	Source	Obs	Mean	Std. Dev.	Min	Max
log(GDP pc)	log of GDP per capita	WDI	399	6.219	0.850	4.281	8.420
log(Agri VA pc)	log of Agricultureal Value Added per capita	FAO-STAT.	388	4.772	0.478	3.779	6.044
log(private credit/GDP)	log of share of domestic credit provided by banking sector in GDP[*1].	WDI	339	3.446	0.839	0.651	5.349
log(private credit by banks/GDP)	log of private credit by Deposit Money Banks and Other Financial Institutions in GDP[*2].	Beck et al. (2000).	283	-1.225	0.693	-2.645	0.507
log(financial system deposit/GDP)	log of Financial System Deposits in GDP.	Beck et al. (2000).	295	-1.382	1.479	-9.596	0.235
log(share of population with primary ed. or above	log of share of the population with education level of primary or above.	Barro-Lee (2000).	359	3.475	0.529	2.230	4.251
log(government expenditure/GDP)	log of share of government espenditure in GDP.	WDI	384	22.479	1.362	19.196	26.497
Population below minimum level of dieta	log of Consumer Price Index.	WDI	336	3.334	1.694	-7.370	5.173
log(Ecport+Import/GDP)	log of the share of Export and Import in GDP.			-0.708	0.729	-2.540	0.894

*1 Domestic credit provided by the banking sector includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The banking sector includes monetary authorities and deposit money banks, as well as other banking institutions where data are available (including institutions that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other banking institutions are savings and mortgage loan institutions and building and loan associations.

*2 This is similar to the first definition, but the first definition covers a broader category of banking sector, including monetary authorities, formal and informal banking institutions, while the second mainly covers private credit through deposit money banks.

Appendix 1 - Definitions and Descriptive Statistics of the Variables (Cont.)

log(private credit/GDP)	log of share of domestic credit provided by banking sector in GDP.	Beck et al. (2000).	75	3.451	0.872	0.960	5.257
predicted log(private credit/GDP)	log of share of domestic credit provided by banking sector in GDP, predicted by annual panel.	Beck et al. (2000).	74	3.499	0.785	1.390	5.186
log(private credit by banks/GDP)	log of private credit by Deposit Money Banks and Other Financial Institutions in GDP.	Beck et al. (2000).	62	-1.213	0.685	-2.437	0.374
predicted log(private credit by banks/GDP)	log of private credit by Deposit Money Banks and Other Financial Institutions in GDP, predicted by annual panel.	Beck et al. (2000).	61	-1.194	0.666	-2.347	0.345
log(financial system deposit/GDP)	log of Financial System Deposits in GDP.	Beck et al. (2000).	65	-1.443	1.695	-9.596	0.186
predicetd log(financial system deposit/GDP)	log of Financial System Deposits in GDP, predicted by annual panel.	Beck et al. (2000).	63	-1.308	1.302	-7.809	0.175
log(schooling years in the initial year)	log of average schooling years of people above 15 years old in the initial year.	Barro-Lee (2000).	77	0.671	0.743	-0.491	1.478
log(GDP deflator)	Inflation as measured by the annual growth rate of the GDP implicit deflator.	WDI	82	1.936	1.053	-0.697	5.847
log(Ecport+Import/GDP)	log of the share of Export and Import in GDP.	WDI	82	-0.671	0.730	-2.385	0.885
log(Population Growth)	log of annual popuoation growth		90	-3.920	0.358	-5.117	-3.461
log (Share of Working Age Population)	the ratio of dependents--people younger than 15 or older than 64--to the working-age population--those ages 15-64.	WDI	90	-0.319	0.219	-0.892	-0.035