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Economic Growth: The Role of Institutions and Political Economy

Economic growth is a complex process involving many dimensions, causal forces and transmission mechanisms. In order to avoid spurious correlations and serious specification errors, it is necessary to place any empirical analysis of growth in a general equilibrium model framework. The institutional framework is just one of many potential causal forces, and institutions may, themselves, be shaped by economic growth. This paper reviews papers published in the mainstream economics journals over the last ten years which have estimated regression equations to explain differences in long-term rates of economic growth across countries. The review focuses on the role of institutions in growth, and it comments on methodological strengths and weaknesses of these types of empirical studies for better understanding the growth process.

The scope of the study is narrowed in three main ways. First, reviewed studies apply to the whole economy. However, the implications could easily be applied to individual sectors or commodities. Second, the studies consider longer-term average growth rates. This enables cyclical and seasonal influences to be ignored. Third, most of the reviewed studies have drawn on the well recognized data banks reported by Summers and Heston (1984, 1988, 1991) which have a high degree of comparability from country to country and over time.

THEORETICAL UNDERPINNINGS

Almost all economic theories, directly or indirectly, have something to say about economic growth. There are many plausible models, often with conflicting implications about the growth process, from which to choose. This section discusses the main theoretical frameworks said to underlie the empirical cross-country studies reviewed.

The neoclassical production function model, initially used by Solow and Swan, is a general foundation for the empirical studies. Its simplest representation is the absolute function:

$$y = f(K,L,T) \tag{1}$$

or the derived growth rate function:

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$$Y = g\ (k,l,t) \tag{2}$$

where Y is real output, K capital input, L labour input and T all other factors, and y is real per capita output growth, k is growth of the capital to labour ratio, l is growth of the labour input to population ratio, and t is all other factors. The third factor, T in (1) and t or multifactor productivity growth in (2), includes technology, size economies and, in the context of this paper, the role of different institutional frameworks and policy strategies. Kuznets, Dennison and Kendrick were pioneers in attempting to decompose and explain multifactor productivity growth. Estimation of versions of (2) explain differences in cross-country growth as due to differences in factor accumulation, the growth of investment and changes in labour, and in forces bearing on the multifactor productivity term. Most empirical cross-country studies have taken a standard line on the factor inputs story of growth; and they differ widely in the representation of forces behind multifactor productivity growth.

With respect to technology, most studies propose a technology catch-up process. It is argued that countries with low initial technology experience higher growth rates than more advanced countries. The term t in (2) is replaced by a proxy for technology status, beginning period per capita income, with an expected negative coefficient. The technology catch-up model has been questioned. Some argue that a threshold level of economic maturity is necessary to be able successfully to mimic advanced-country technology. Writers in the new growth literature, including Romer (1990) and Grossman and Helpman (1992), attempt to explain technology as a function of the human capital stock, the stock of R & D itself, and of government investment in complementary physical capital. Empirical evaluation of the new growth literature is still in its infancy. Olson (1982) and Brezis *et al.* (1993) suggest that the rate of technological growth can be subject to the influence of institutional scelorisis and exhibit leapfrogging behaviour rather than a steady exogenous growth path assumed in most applications of the simple neoclassical production function model.

Several studies use Feder's (1983) two-sector neoclassical production function model to capture the effects of differences in initial levels of productivity between sectors and of initial factor returns disequilibrium between sectors on the aggregate economic growth rate. Sectoral classifications have included private and government, export and rest of economy, and agriculture and non-agriculture. The political and institutional structure encompasses many formal and informal considerations. From an economic growth perspective, they include the rights and responsibilities of individuals, groups and governments on the ownership, use and disposal of factor inputs and of outputs; the incentives and rewards facing individuals as households and firms; simplicity, continuity and confidence in laws and regulations as they affect transactions costs; and more detailed structures of taxation, social welfare and industry policies. They can affect the factor supply terms, K and L in (1), as well as the productivity with which these factors are combined, T in (1). The empirical cross-country studies focus primarily on this latter influence, although clearly the indirect effects of institutions on factor accumulation are important.

Przeworski and Limongi (1993) survey the long, continuing and controversial debate on the role of, and direction of causation between, political and

economic institutions and economic growth. Important insight is provided by North (1990). It is argued that political institutions affect economic growth, both at the broad level, for example democracy versus dictatorship, and in more detail, for example as they affect labour markets and property rights. However, the causal links are diverse, complex and not easily captured by crude dummy variable techniques in econometric studies. Many argue that the direction of causation runs from economic growth to political regime, rather than vice versa (Huber *et al.*, 1993).

Government macroeconomic and microeconomic policies clearly influence productivity growth as well as the supplies of capital and labour inputs. Arguments for and against have been advanced for the link between government consumption outlays and economic growth. Positive causal links include harmonizing conflicts, preventing exploitation by foreigners, countering various market failures and securing increases in productive investment. Potential negative links include relative inefficiency of government supply, waste of resources to rent seeking and distortions to decisions caused by taxation. Several authors have argued for a simultaneous causal relationship between economic growth and government expenditure.

Monetary policy, and particularly its influence on the average rate and variability of inflation, may adversely affect national productivity. High and variable inflation creates uncertainty, confuses changes in relative prices and reduces confidence in making longer-term decisions. Outward-oriented trade policies foster increases in static and dynamic productivity relative to protectionist policies. Edwards (1993) provides an excellent review of the literature. In empirical work, difficulties are encountered in representing different trade policy stances. Often a two-equation approach is followed, with one equation explaining the export share of GDP as a function of policy variables, and the export share is used as an explanatory variable in a growth equation such as (2). The set of policy variables which are potential determinants of multifactor productivity growth could be extended to include descriptions of the taxation system and rates, regulation of labour and capital input markets, and domestic industry regulatory strategies.

The foregoing brief summary highlights limitations of theoretical guidance for specifying estimable models of cross-country economic growth. Different models suggest different explanatory variables, often the direction of effect is ambiguous and in several cases simultaneous relationships are indicated. Also converting general ideas about institutions and policies into measurable variables is difficult conceptually as well as empirically. Not surprisingly, a wide range of equations purporting to explain economic growth have been specified.

EMPIRICAL METHODOLOGIES

The principal data source for the empirical cross-country studies reviewed in this paper has been the Summers and Heston (1984, 1988, 1991) set of national accounts economic time series. They attempt to provide constant price series using a common currency so that real quantity comparisons can be made over

time and across countries. The latest version has data for 27 variables for 139 countries by year from 1950 to 1988. It is acknowledged that there are remaining measurement errors, and more so for the developing countries. Supplementary data on political and economic institutions and on some policy variables have come from other sources detailed in particular studies.

Most studies use the average annual per capita real income growth rate as the dependent variable. Per capita variables correct for differences in population and in population growth rates; a few studies test for scale effects. Averaging over several years, in some cases decades, or fitting trend lines, remove cyclical and short-term random effects. Bivariate simple correlations and rank correlations between growth rates and a potential explanatory variable represent the simplest form of empirical analysis. The correlations ignore issues of causality and the effects of other explanatory variables. Single-equation regression models on a cross-section of country averages enables a large number of potential explanatory variables to be explored. Usually OLS is applied under the assumption of one-direction causality. In a few cases, an instrumental variables estimator has been used in recognition of simultaneous causality between economic growth and some of the explanatory policy variables. Where an extended time series as well as cross-section data set has been available, some studies have used a mixed time series and cross-section estimator on the panel data. This enables assessment of country specific and of time-specific explanatory effects not captured by the general set of explanatory variables.

Many of the studies have undertaken and reported extensive sensitivity evaluations to assess the robustness of their results. Variations reported include time periods, countries, list of explanatory variables and functional form. Results of a range of statistical diagnostic tests are often reported.

Results

Table 1 collates empirical cross-country studies reported in the main economics journals which have attempted to explain differences in rates of economic growth over the period from 1950 to the present using the Summers and Heston data. The studies are referenced against four sets of potential explanatory variables: the neoclassical production function model with factor supplies growth and technology catch-up; the new growth theory explanation of determinants of technological growth; political and economic institutions represented by dummy variables; and government expenditure, monetary, trade and microeconomic policies. This section highlights the important causal variables indicated by the studies and it comments on methodological issues.

The conventional neoclassical production function model explaining growth in terms of growth of factor supplies and technology has good explanatory power, especially for the developed and rapidly developing countries. In all studies, increases in the capital to labour ratio, often proxied by the investment to GDP ratio, have a large significant influence. In the few studies using a labour deepening variable to capture changes in young and aged dependency ratios and changes in workforce participation ratios, increases in the per capita labour input significantly raise the economic growth rate. Technological catch-

TABLE 1 *Explanatory variables used to explain economic growth rates in cross-country regressions using Summers and Heston data*

Explanatory variable		Study and sample
1	Factor supply: neoclassical	
(a)	Physical Capital Deepening (proxy by I/Y ratio)	Dowrick & Nguyen (1989) – OECD countries, 1950–81 Dowrick & Gemmell (1991) – 78 countries, 1973–85 Dowrick (1991) – 113 countries, 1960–88 Scully (1988) – 115 countries, 1960–80 Ram (1986) – 115 countries, 1960–80 Kormendi & Meguire (1985) – 47 countries, 1950–77 Castles & Dowrick (1990) – 78 countries, 1960–85
(b)	Labour deepening (participation rate & dependency rate)	Dowrick & Nguyen (1989) – OECD countries, 1950–81 Dowrick (1991) – 113 countries, 1960–88
(c)	Technological catch-up (proxy by starting real GDP per capita)	Dowrick & Nguyen (1989) – OECD countries, 1950–81 Barro (1991) – 98 countries, 1960–85 Dowrick & Gemmell (1991) – 78 countries, 1973–85 Dowrick (1991) – 113 countries, 1960–88 Grier & Tullock (1989) – 113 countries, 1951–80 Kormendi & Meguire (1985) – 47 countries, 1950–77 Castles & Dowrick (1990) – 78 countries, 1960–85
2	Factor supply: new growth	
(a)	Human capital (% of working age with primary and secondary school education)	Barro (1991) – 98 countries, 1960–85
3	Institutional arrangements	
(a)	Political liberty	Scully (1988) – 115 countries, 1960–80 Kormendi & Meguire (1985) – 47 countries, 1950–77 Grier & Tullock (1989) – 113 countries, 1951–80
(b)	Economic system	Scully (1988) – 115 countries, 1960–80
4	Government policies	
(a)	Government expenditure (government consumption expenditure share of GDP, growth rate of real government expenditure)	Ram (1986) – 115 countries, 1960–80 Dowrick (1991) – 113 countries, 1960–88 Grier & Tullock (1989) – 113 countries, 1951–80 Barro (1991) – 98 countries, 1960–85 Castles & Dowrick (1990) – 97 countries, 1960–85
(b)	Monetary and inflation	Kormendi & Meguire (1985) – 47 countries, 1950–77 Grier & Tullock (1989) – 113 countries, 1951–80
(c)	Trade policies	Kormendi & Meguire (1985) – 47 countries, 1950–77
(d)	Other microeconomic	Barro (1991) – 98 countries, 1960–85

up, represented by the beginning period real per capita income variable, is a significant and important explanatory variable for all the OECD and middle-income developing countries. However, this variable is often not significant for sub-samples of developing countries, supporting the hypothesis of a minimum threshold economic status before overseas technology can be readily adopted. For the OECD countries as a group, the neoclassical model explains more than two-thirds of the observed cross-country variance of growth rates. However, it explains less than a third of the variation of growth rates among developing countries.

Barro (1991) finds increases in the school participation rate to be a significant explanatory variable, and its explanatory importance is quite large for samples of developing countries. The human capital contribution of education appears likely to work through labour quality and hence the speed of the technology adoption process of the new growth theory. Data limitations lie behind the few studies which have included education and other labour quality variables.

Estimates of the effects of dummy variables representing different political and economic institutions on economic growth in the studies collated in Table 1 and in the extensive review by Przeworski and Limongi (1993) are mixed and disappointing. The estimated direction of effects changes from study to study and from sample to sample. For example, in some cases democracy is favoured over dictatorship, and in some cases the reverse. The estimated parameters often have relatively large standard errors, and the estimates are not robust to variations of country and time period samples. Reasons for the mixed empirical results include ambiguity of theoretical effects as discussed above; the broad and somewhat arbitrary classifications of institutions with different authors sometimes placing the same country in different categories; problems of multicollinearity when variables for both political and economic institutions are included; the lack of independent variability of observations in the available sample data; and likely simultaneous equation bias with the use of OLS. Despite these and other criticisms, the empirical results indicate that institutions influence economic growth.

However, much more detailed work will be necessary if empirical studies are to offer effective guidance to policy makers on the choice of institutions. First, greater disaggregation and detail about different institutions is required with supporting theoretical arguments as well as data. Second, it is likely that consideration should be given to the time pattern of effects, and the sequencing of institutional changes, on economic growth. Adjustment paths probably run into decades and may not be revealed in the relatively short time zones of the studies reported in Table 1. The collection of required data will clearly be a costly and difficult challenge. In fact, it is probable that the domain of natural experiments will be too narrow to enable estimation of the effects of many institutional options. Third, in the estimation stage, there should be diagnostic testing for the direction of causation between economic growth and institutions. In the event of simultaneity, appropriate systems estimators rather than OLS should be used.

Several of the empirical cross-country studies of economic growth collated in Table 1 have included explanatory variables for different settings of govern-

ment economic policy instruments, including government expenditure, monetary policy and trade protection. Most, but not all, of the studies find the different policy settings to influence long-term economic growth rates between countries, however, the additional explanatory power is relatively small at less than a ten percentage point increase in the R^2 value. Studies including government consumption expenditure as an explanatory variable have differed in terms of using the expenditure to GDP ratio, the rate of growth of this ratio, or both. The different specifications mostly find a positive effect of government consumption expenditure on long-term growth using the OLS estimator. Dowrick (1991) takes up the simultaneity issue; his statistical tests reveal bi-causality between economic growth and government expenditure as a share of GDP; and when a more appropriate instrumental variable estimator is used, government expenditure ceases to be a significant explanatory variable. Castles and Dowrick (1990) report estimates for a more disaggregated set of government expenditure components, and this type of more programme-specific analysis is potentially of greater use to a policy assessment.

The effects of monetary policy, or of inflation which largely reflects monetary policy, on comparative economic growth rates across countries is examined in two studies shown in Table 1. The effect of the average rate of inflation varies with the time period and the country sample, and often it is not a significant explanatory variable. These results support the hypothesis of the long-run neutrality of money on real variables. By contrast, both studies find that greater volatility of monetary policy and of inflation significantly reduces the rate of economic growth. Inclusion of a variable for the trade share of GDP, or growth in the share, in the list of explanatory variables usually indicates a significant positive influence on long-term growth. However, the coefficient magnitude is not generally robust for different time periods, different country groupings and different lists of other explanatory variables. Also causality tests indicate bi-causality between economic growth and trade shares, further casting doubt on the reported OLS estimates. None of the studies reported in Table 1 included trade policies as such and, as Edwards (1993) notes in his review, that would be a desirable improvement in model specification and usefulness.

In terms of ability to explain differences in long-term economic growth rates across countries, the studies reported in Table 1 are relatively good for the developed and the rapidly growing developing countries with R^2 values of 0.67 and better, though their explanatory power for the poorer developing countries is more modest, with very few having R^2 greater than 0.33.

CONCLUSIONS

Empirical cross-country regression studies provide useful insights of a broad nature about the sources and causes of long-term economic growth, though their usefulness as a source of policy advice for developing countries is limited. Increases in factor endowments, especially physical and human capital, are important sources of economic growth, but also important is multifactor productivity growth, which has been referred to as our 'measure of ignorance'. In the middle-income developing and developed countries, technology catch-

up explains a part of multifactor productivity growth, but this effect seems not to be operable within the poor countries. Government fiscal, monetary, trade and microeconomic policies appear to be able to influence the rate of productivity growth. Less than a half of the variation of growth rates of developing countries was explained by the reported models.

Overall, the studies provide very limited evidence of the effects of different political and economic institutions on long-term economic growth. If such studies are to assist policy advice, institutional alternatives will need to be disaggregated and specified more precisely, more explicit theoretical and practical understanding of the underlying transmission mechanisms will be required, more detailed longer-run data series will be needed to support the estimations, and almost certainly a general equilibrium model involving multiple equations and simultaneous equation estimators will be necessary.

The studies reviewed highlight a number of good practices to be followed in empirical cross-country studies, such as the use of a fully specified model with all potential key explanatory variables included (even if the main interest is in only a sub-set of variables), consideration of simultaneous relationships in a general equilibrium context and appropriate estimators, and testing robustness of the estimates to different specifications and samples.

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