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THE ROLE OF MICRO, SMALL, AND MEDIUM ENTERPRISES IN ECONOMIC GROWTH: A CROSS-COUNTRY REGRESSION ANALYSIS

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CONTENTS

ACRONYMS

Acronym	Explanation
AMAP	Accelerated Microenterprise Advancement Project
GDP	Gross Domestic Product
IQC	Indefinite Quantity Contract
IRIS	Institutional Reform and the Informal Sector
IV	Instrumental Variable
MCME	Making the Case for Microenterprises
ME	Microenterprises
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
SME	Small and Medium Enterprises
USAID	US Agency for International Development

ABSTRACT

This study explores the role of micro, small, and medium enterprises in the growth of per capita income, using an expanded database for firms in the formal manufacturing sector with fewer than 10, 20, 100, or 250 employees. Employing regression models from the economic growth literature, this study finds evidence of a causal connection between economic growth and the prevalence of firms of medium size or smaller (250 employees or less). However, it finds only limited correlative or causal connection between growth and the prevalence of small or micro firms with fewer than 10, 20, or 100 employees.

BACKGROUND

In 2004, USAID, under the AMAP IQC, commissioned the IRIS Center for a research study to examine if and how micro enterprises contribute to economic growth in developing countries.

A detailed literature survey shows that micro and small enterprises contribute to economic growth through several pathways that go beyond job creation. [1] A conceptual framework was developed for the study, based on literature surveys and consultations with an advisory panel. IRIS identified unexplored primary and secondary pathways for micro and small enterprises to contribute to economic growth, including entrepreneurship, economic dynamism, linkages in value chains, and societal development.[2] "Primary pathways" have greater and more direct impact on growth; they include promoting entrepreneurship and economic dynamism, and creation of value chains through linkages with large firms. "Secondary pathways" are the indirect channels through which micro and small enterprises may contribute to overall economic growth and include human capital improvement, financial market development, societal development, and contributions to other industry sectors.

We then formulated the following hypotheses. (1) Growth of small and micro enterprises is positively associated with economic growth, (2) For small and micro enterprises to grow, industry dynamism and linkages within value chains are important.

In order to test the hypotheses, detailed analyses were carried out at three levels: (i) the macro level, using secondary aggregate static data from 60 countries, to examine causal effects of micro, small and medium enterprises on economic growth; (ii) the meso level, using secondary panel data from small and large industries in Canada, OECD and developing countries, to identify characteristics of dynamic industries and how they map into small and large industries and cause economic growth; and (iii) the micro level, using primary cross-section data gathered for the study from larger firms and micro enterprises in Bangladesh and Peru, to examine if forward linkages facilitate micro enterprises contributions to economic growth. The current report presents the results of the macro-level research.

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1 See the Literature Review undertaken by the IRIS Center as part of the MCME project. http://www.microlinks.org/ev_en.php?ID=12577_201&ID2=DO_TOPIC

2 See Ayyagari and Maksimovic, 2006. http://www.microlinks.org/ev_en.php?ID=12578_201&ID2=DO_TOPIC.

1. INTRODUCTION

Is micro and small enterprise programming warranted? Apart from other programming benefits, is there a clear case that micro and small enterprises have a discernible impact on economic growth? These are the questions the present study explores through a systematic examination of the cross-national evidence for a direct link between economic growth and the prevalence of micro, small, and medium manufacturing enterprises.

To pursue this empirical analysis, this study builds on the analysis Beck et al. (2005) [3] performed for small and medium enterprises. First, it expands that paper's cross-national database—adding more countries and more recent country observations. Second, it extends the database to include finer firm size classifications.

Consequently, this IRIS study is the first to test the direct link between the prevalence of micro enterprises—that is, of firms with fewer than 10 or fewer than 20 employees—and economic growth. By virtue of its data set, it is also the first to explore this link across incrementally larger firm size classifications—from firms with fewer than 10 employees up to firms with fewer than 250 employees.

Employing regression models from the economic growth literature, this study finds evidence of a causal connection between economic growth and the prevalence of firms that employ 250 employees or less. However, results from analysis of this relationship with finer disaggregation by number of employees are inconclusive. We find only limited correlative or causal connection between growth and the prevalence of small or micro firms with fewer than 10, 20, or 100 employees. In other words, our data do not show a consistent pattern across micro, small, and medium firms that a large ME or SME sector results in higher economic growth.

The lack of consistent evidence in this study however, should be interpreted with caution. The data used in this study are static and limited to the formal manufacturing sector, and they may not reflect ME contributions that are either dynamic or outside the formal economic sector. These data features are explained in more depth in chapter 4.

Furthermore, the conclusions of this study do not, on their own, make a definitive case for or against micro enterprises. They only offer additional information on the contribution of micro and small enterprises to improved economic performance in developing economies. Additional information that explains the context of potential pathways for ME and SME growth —namely dynamism and linkages into value chains— are required to complement this study. [4]

In the next section, we present a description of the IRIS database and detail its construction. In chapter 3, we discuss the empirical results, in turn, for micro, small, and medium enterprises. In chapter 4, we offer our conclusions.

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[3] Beck, T., Demirguc-Kunt, A. and Levine, R., "SMEs, Growth, and Poverty," NBER Working Paper 11224, 2005.

[4] These are explored in companion papers to this study. See the following USAID microREPORTs: "Industry Growth, Firm Size, and the Business Environment" (#127), "Microenterprises in Bangladesh: Contribution to Economic Growth" (#128), "Microenterprise Contribution to Economic Growth through Forward Linkages with Large Firms in Peru" (#136), and "Forward Linkages and Well Being of Outsourcee Microenterprise Households in Peru" (#137).

2. DATA AND METHODOLOGY

2.1. DESCRIPTION OF THE DATA USED

This IRIS study follows existing literature in the selection of variables to examine the relationship between economic growth and the prevalence of micro enterprise. [5]

Growth and national policy variables. To measure growth, the study computes the annualized growth rate of real GDP per capita for the applicable time period. [6] To control for other primary determinants of economic growth, and thereby isolate the effects of micro enterprises, the study adopts a standard set of national policy environment variables. [7] To provide an additional control for the national policy environment, the study uses select World Bank Doing Business data series[8] to construct a business environment index via principal component analysis. [9]

Measures of ME and SME prevalence. [10] For a measure of micro, small, and medium enterprises, this study constructs an indicator of the relative prevalence for each firm size classification. The study first sums the total employment for firms of a given size—say, firms with 20 employees or fewer. The study then computes the relative share of employment for that firm size cutoff—dividing, for example, employment in firms of 20 employees or fewer by total manufacturing employment. To provide a picture of prevalence for each incremental firm size cutoff from 10 employees or fewer to 250 employees and fewer, the study repeats this procedure for each size classification. Like earlier efforts, this study limits its measures to the formal manufacturing sector due to limited data availability. [11]

2.2. DIMENSIONS OF THE DATA

This IRIS study improves on existing cross-national databases in several data dimensions. [12] It adds to country coverage, providing a broader cross-section of country data. It adds to the time dimension, updating the data set and creating two periods for analysis. It also adds to the firm size classifications, furnishing a range of prevalence measures, from firms with fewer than 10 employees to firms with fewer than 250 employees.

Country coverage dimension. This study both updates and expands the country coverage of previous data collection efforts. By seeking new country observations from previously identified public domain sources, [13] the

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5 This study adopts the variable choice outlined in Beck et al. (2005).

6 The construction of time periods is explained more fully in the "Dimensions of the data" section.

7 Inflation; black market premium; amount of private credit; secondary school enrollment; exports and imports as a percentage of GDP; government consumption as a percentage of GDP.

8 Cost of entry; cost of contract enforcement; efficiency of bankruptcy; and degree of property rights protection.

9 Principal component analysis is a statistical method that distills the correlation between multiple indicators into a more limited set of factors or underlying components.

10 In addition to the measure presented in this paper, IRIS also collected data, constructed variables, and performed analysis for other measures of ME and SME prevalence. It constructed a measure of MEs and SMEs based on the official country definition. It constructed a measure of importance based on value added by enterprises of a given size. For MEs it used number of establishments as an indicator of the importance of firms of a set employment size.

11 The present study recognizes that the informal-sector ME and SME population may make significant contributions to economic growth. However, like earlier efforts, this study was unable to locate reliable sources of cross-nationally comparable data on the relative importance of the informal sector. Additionally, the present study attempted to collect cross-national data on other formal-sector industries, but could not construct a data series with adequate country coverage for rigorous analysis.

12 The IRIS study largely adopts the data collection and construction methodologies outlined in Ayyagari, M., Beck, T., and Demirguc-Kunt, A. "Small and Medium Enterprises across the Globe" World Bank Working Paper WPS2127, 2003. However, the study departs from this framework in three important ways. First, it supplements the data sources. Second, it adapts the SME procedures to constructing ME data. Third, it extends the principle of SME data series averages to multiple time periods for SME and ME data alike.

13 See Ayyagari et al. (2003) for the complete list of SME data sources used in Beck et al. (2005) for the period from 1990 to 2005. See also the International Finance Corporation note "Micro, Small, and Medium Enterprises: a Collection of Published Data"

study improves the accuracy of the SME measures explained above. By introducing new countries into the cross-national database, this IRIS study also provides a wider sample of country data than previously available. In practical terms, for firms of fewer than 250 employees this means an increase in sample size from 54 to 60. [14] In previously unexplored enterprise size classifications, such as firms of fewer than 10, 20, or 100 employees, this data implies sample sizes of 43, 43, and 54, respectively. [15]

Time dimensions. The temporal addition is twofold. First, the study adds the most recent data for originally available countries as well as for previously unavailable countries. This allows greater precision in analysis, since the database reflects a longer time horizon than was previously possible.

Second, the study supplies two time periods: one extending from 1990 to 2005, the other from 1997 to 2005. With two time periods, the study compares possible changes in the growth-ME relationship across time, taking in one instance the long view and in the other a shorter view. With these two particular time periods, the study examines the extent to which the early 1990s—when several countries either achieved independence or underwent radical economic reforms—may have higher (or lower) than "equilibrium" levels of micro, small, and medium enterprises. With the second time period, the study compares results across MEs and SMEs, since ME data are only available from 1997 to 2005.

Firm size classification dimension. More important than the time dimension, though, is the addition of supplementary size classifications—in particular, of micro enterprises, for which data had not previously been compiled. Whereas earlier work had been confined to larger-sized firms—a cutoff of firms with 250 employees or fewer was used—this study explores how growth performance relates to enterprise prevalence for truly micro and small, instead of medium-sized, enterprises. In addition, because the IRIS study collects data for each incrementally larger size classifications from micro to medium, it investigates how the growth relationship may change as the firm size considered increases or decreases.

(http://rru.worldbank.org/Documents/other/MSMEdatabase/msme_database.htm) for supplementary sources as well as readily accessible electronic data set.

[14] The sample size quoted above, 60, is for data in period from 1990 to 2005. The sample size at the 250 employee cutoff is 42 for the period from 1997 to 2005.

[15] The sample size MEs with employment of 10 and 20 is for the 1997 to 2005 only. The sample size for SMEs of fewer than 100 employees is for the period from 1990 to 2005. The sample size at that same cutoff for the period from 1997 to 2005 is 44.

3. MICRO, SMALL AND MEDIUM ENTERPRISES AND ECONOMIC GROWTH: EMPIRICAL RESULTS

To answer the question of whether MEs or SMEs matter for economic growth, this IRIS study tests two hypotheses.

Hypothesis 1: Countries with larger ME or SME sectors have more rapid economic growth in per capita income than their counterparts, even after controlling for other known sources of economic growth.

To investigate this hypothesis, the study uses an Ordinary Least Squares (OLS) regression model and utilizes the standard set of explanatory variables for economic growth used in Beck et al. (2005) [16] as controls to isolate the connection between MEs or SMEs and growth. In interpreting the results of this model, this study takes a positive coefficient of the ME or SME variable to indicate that economic growth increases with ME or SME prevalence, a prima facie affirmation of hypothesis 1. This study also pays heed to the statistical significance of the ME or SME coefficient, to ensure that the result is not the product of chance alone. [17] Consequently, the study takes a positive and statistically significant coefficient for the ME or SME variable as statistical support for the hypothesis. To correct for undue influence of outlying data points, this study borrows the outlier removal procedures from Beck et al (2005) [18] and reports these robust regression results alongside those of the regular OLS model. Finally, to account for the possible direct influence of business environment on economic growth, this study adds an index of national business environment to the set of explanatory variables mentioned above.

Hypothesis 2: Greater ME or SME prevalence actually causes more rapid growth in per capita income.

The OLS regression results may reveal that countries with a high prevalence of MEs or SMEs also grow faster, on average. However, this result is not enough evidence to say that the prevalence of MEs or SME causes increased economic growth. This result does not control for reverse causality (or, in econometrics terms, endogeneity)—for example, for the possibility that greater growth may coincide with more MEs or SMEs only because higher economic growth may lead entrepreneurs to form more MEs or SMEs to take advantage of favorable business conditions. To control for this potential endogeneity, we employ the Instrumental Variables (IV)[19] approach as well as instruments found in Beck et al. [20] As with the OLS results, our second hypothesis would be supported by a positive, statistically-significant coefficient on the ME or SME variable. Outliers were removed, as in the OLS regressions, to present robust results. Also, as with OLS model, the second hypothesis is additionally tested by controlling for the national business environment.

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16 Following both Beck (2005) and a large literature on economic growth accounting, this study isolates the contribution to growth of MEs or SMEs by controlling for the for the following factors: the initial per capita income; the percentage of secondary school enrollment; the percentage of government consumption; the inflation rate; the black market premium on the national currency exchange rate; the percentage contribution of trade to gross national product; and the claims on the private sector by deposit money banks.

17 Significance levels of 1, 5, and 10 percent are commonly used in social science research in calling an association or relationship "statistically significant." This implies that there is a 1, 5, or 10 percent probability that the association between these variables is due to chance.

18 For certain firm size classifications and specifications, this mechanical outlier procedure removed a substantial number of countries. To provide a fuller view of the relationships within the data, we include results with and without outliers. One future avenue for research and validation of the results here is to employ alternative detection procedures to determine their impact on the hypothesis testing.

19 The IV approach uses a 2-stage regression model; the first stage uses various instruments to remove the endogenous component of the ME or SME value.

20 The instrumental variables were: a dummy variable for transition economies, a dummy variable for sub-Saharan Africa, a dummy for Latin America, and ethnic fractionalization (a measure of the likelihood that members of the same nation do not speak the same language). Future research could conduct systematic weak instrument tests on the existing set of instruments and also to search for additional instruments to substitute in their place.

3.1. SMALL AND MEDIUM ENTERPRISES

For this study, we define SMEs as firms with 100 or fewer employees and also, to follow earlier literature, as firms with 250 or fewer employees. For these definitions, average SME employment shares in the manufacturing sector are available for two time periods: for the full time period available of 1990 to 2005 and also for the more recent period from 1997 to 2005, for which comparable ME data are also available.

3.1.1. FIRMS WITH 250 EMPLOYEES OR FEWER

Countries with larger shares of SME employment have higher economic growth than their counterparts. [21] First, results are always positive (see OLS results in Table 1), indicating that, on average, countries with more prevalent SME employment experience higher growth. In addition, these results are generally statistically significant, especially in the 1990 to 1997 time frame. These positive results for hypothesis 1 echo those found in an earlier, influential paper investigating the cross-country growth relationship for firms with fewer than 250 employees. [22]

Table 1: Economic Growth and Prevalence of Share of SME Employment for Firms of 250 Employees and Fewer

	1990-2005				1997-2005			
	hypothesis 1		***hypothesis 2***		***hypothesis 1***		***hypothesis 2***	
cutoff	OLS	robust OLS	IV	robust IV	OLS	robust OLS	IV	robust IV
SME250	+***	+*	+	+	+**	+**	+**	+***

Notes: * denotes 10%, ** 5%, and *** 1% levels of statistical significance

For the question of causality posed by hypothesis 2—whether higher SME employment shares actually drive, rather than simply accompany, superior economic performance—the statistical picture depends on the time period considered. The results for the more recent period in the IRIS database, from 1997 to 2005, do support a causal connection—and often with strong levels of statistical significance (see sign and significance level for IV and robust IV models in Table 1). On the other hand, the empirical results for the full period, from 1990 to 2005, do not support the hypothesis of a direct causal linkage (see the IV and robust IV results for this time period in Table 1). These results are similar to those in Beck et al. in their IV results for 1990 to 2005. Consequently, for hypothesis 2 **our research results suggest a positive causal link only between SME prevalence and economic growth in recent years.**

Controlling for the business environment in each country reduces the statistical significance of the relationship between SME prevalence and economic growth. The linkage between these two economic phenomena—countries with high prevalence having high growth—may also depend on another element operating in these countries' economies: the business environment. In looking over the results in Table 2, the astute observer will notice the lack of a statistically significant causal relationship in the 1990 to 2005 period, but evidence of causality remains in the shorter 1997 to 2005 period.

Table 2: Economic Growth and Prevalence of Share of SME Employment for Firms of 250 Employees and Fewer, Controlling for Business Environment

	1990-2005				1997-2005			
	hypothesis 1		***hypothesis 2***		***hypothesis 1***		***hypothesis 2***	
cutoff	OLS	robust OLS	IV	robust IV	OLS	robust OLS	IV	robust IV
SME250	+**	+**	-	+	+	+*	+	+***

Notes: * denotes 10%, ** 5%, and *** 1% levels of statistical significance

[21] Using a data set with a narrower country coverage than the IRIS study's, Beck et al. (2005) finds a positive and statistically significant correlation between economic growth and the employment share of firms with 250 employees or less.

[22] Beck et al. (2005)

3.1.2. FIRMS WITH 100 EMPLOYEES OR FEWER

Countries with larger shares of SMEs with 100 employees or fewer do not have higher economic growth. The basic association between SME prevalence and economic growth is consistently negative, although rarely at a statistically significant level, across both time periods (see OLS and Robust OLS results in Table 3). In other words, countries with a higher prevalence of SMEs tend, on average, to have lower rates of economic growth, but this relationship may be due only to chance. That is, the results derived from this study's data do not support hypothesis 1 for firms of fewer than 100 employees.

SMEs with 100 employees or fewer do not cause higher economic growth. The causal relationship between SME prevalence and economic growth (hypothesis 2) is negative and statistically insignificant for the full 1990 to 2005 period. For the 1997 to 2005 period, there is some evidence of a positive relationship (at the 10 percent level, see Robust IV in Table 3). However, this evidence should be weighed in light of a preponderance of other evidence. For instance, while this result indicates a positive, causal relationship between SME prevalence and economic growth, another result in the same time period indicates a negative relationship if outliers are included.

Table 3: Economic Growth and Prevalence of Share of SME Employment for Firms of 100 Employees and Fewer

	1990-2005				1997-2005			
	hypothesis 1		***hypothesis 2***		***hypothesis 1***		***hypothesis 2***	
cutoff	OLS	robust OLS	IV	robust IV	OLS	robust OLS	IV	robust IV
SME100	-	-	-	-	-	-**	-	+*

Notes: * denotes 10%, ** 5%, and *** 1% levels of statistical significance

The business environment may mitigate the relationship between SME prevalence and economic growth. After controlling for the business environment (Table 4), there is no statistically-significant association or causal relationship between SME prevalence (100 employees or fewer) and economic growth. This is true for both time periods of analysis. As in the other results for this firm size cutoff, the direction of the statistical association or causal relationship is generally negative; countries with a higher prevalence of SMEs tend to have lower rates of economic growth.

Table 4: Economic Growth and Prevalence of Share of SME Employment for Firms of 100 Employees and Fewer, Controlling for Business Environment

	1990-2005				1997-2005			
	hypothesis 1		***hypothesis 2***		***hypothesis 1***		***hypothesis 2***	
cutoff	OLS	robust OLS	IV	robust IV	OLS	robust OLS	IV	robust IV
SME100	-	-	-	-	-	-	+	+

Notes: * denotes 10%, ** 5%, and *** 1% levels of statistical significance

3.2 MICRO ENTERPRISES

For this study, MEs are defined both as firms with fewer than 10 employees and as firms with fewer than 20 employees.

Countries with larger shares of MEs do not have more rapid economic growth rates in per capita income. In statistical terms, there is no clear correlation between a larger ME or SME sector and rapid economic growth in per capita income in this sample of countries, after controlling for other determinants of economic growth (hypothesis 1). As the reader can see for the OLS model in Table 5, the relationship is negative but not statistically significant, which means that this apparent pattern—lower growth accompanying more prevalent MEs—could have arisen by chance alone. As the reader can also see in the robust OLS model in Table 5, this negative but statistically insignificant

relationship appears even when outliers are excluded from analysis. Taken together, these results do not support hypothesis 1 for MEs.

Table 5: Economic Growth and ME Prevalence

	1997-2005			
	hypothesis 1		***hypothesis 2***	
cutoff	OLS	robust OLS	IV	robust IV
ME10	-	-	+	+
ME20	-	-*	-	-

Notes: * denotes 10%, ** 5%, and *** 1% levels of statistical significance

MEs cannot be shown to be the clear, causal force behind economic growth. In other words, greater ME prevalence does not appear to cause more growth in per capita income. As with the question of correlation above (hypothesis 1), the evidence of a causal relationship (hypothesis 2), for both the 10- and 20-employee definitions of MEs, lacks statistical significance. Also, the causal relationship is not stable in sign, as it changes from positive to negative as the analysis moves from MEs with fewer than 10 employees to MEs with fewer than 20 employees. Statistically, then, this study does not offer definitive evidence to support hypothesis 2, that MEs directly drive economic growth.

The business environment may matter more for the larger of the manufacturing MEs. The results in Table 5 do not account for the possible direct influence of the national business environment. When controlling for the growth effects of a favorable business environment, the empirical results in Table 6 resemble those obtained in other regression specifications. But the results are different in one noteworthy way. Whereas in Table 5, the regression results (for hypothesis 2) failed to show any statistical significance, those for the robust IV model (for hypothesis 2) in Table 6 now support a causal effect of ME prevalence on economic performance for the 20-employee cutoff at the 10 percent significance level. While this finding should be leavened by other results for ME prevalence, **it does support hypothesis 2 for MEs with fewer than 20 employees,** controlling for country business environment.

Table 6: Economic Growth and ME Prevalence, Controlling for Business Environment

	1997-2005			
	hypothesis 1		***hypothesis 2***	
cutoff	OLS	robust OLS	IV	robust IV
ME10	-	-	+	+
ME20	-	-	+	+*

Notes: * denotes 10%, ** 5%, and *** 1% levels of statistical significance

3.3 SUMMARY OF RESULTS

When viewed across the spectrum of all the ME and SME firm size classifications, the empirical results offer two messages. **First, the results are sensitive**—sensitive to the firm size definition, sensitive to the time period considered, and sensitive to the empirical specification employed. **Second, the results provide only scattered support for hypotheses 1 and 2**, controlling for the business environment, amid select firm size classifications and time periods.

From one firm size classification to the next, the results present different pictures of how MEs and SMEs relate to economic growth. For example, when moving from SMEs of fewer than 100 employees to SMEs of fewer than 250, the results for the OLS models (in Table 1 above) change in both sign and statistical significance. The observed relationship goes from negative and statistically insignificant to positive and highly statistically significant—

in other words, from an indication that SMEs coincide with lower growth to a statistical confirmation that SMEs appear alongside higher average economic growth rates.

From one time period to the next, the results for firms of the same size often vary. From the 1990-2005 period to the 1997-2005 period, the sign of the causal relationship for firms of fewer than 100 employees (in robust IV model in Table 3) changes from negative to positive while retaining the same level of statistical significance. For firms of fewer than 250 employees, after controlling for business environment, the statistical significance of the OLS result (in Table 2) changes, from statistically insignificant for 1990-2005 to highly statistically significant for 1997-2005.

From one model to another, the results often range in sign and statistical significance. For firms of fewer than 100 employees, the robust IV result for the 1997-2005 loses its statistical significance when the business environment is included in the empirical specification. But for firms of that same size, the results for the OLS model and that same time period (in Tables 3 and 4) stay the same before and after controlling for the direct impact of the business environment on growth. Similarly, the results vary across models that, alternatively, include and exclude outliers. For MEs with fewer than 20 employees, the results are statistically insignificant before outliers are excluded but turn statistically significant when outliers are eliminated from analysis (in Table 5).

In conclusion, this study does not show a consistent connection between MEs or SMEs and economic growth across the dimensions of the database. For small and medium enterprises, evidence of an association or casual link between SMEs and economic growth is more frequently positive and statistically significant. At the largest firm size cutoff of 250 employees or less, there is some sustained evidence (at the 5 percent level) of a causal relationship. For many of the results at the lower firm size cutoffs, the association between growth and ME or SME prevalence is instead negative, although seldom statistically significant, and evidence of a causal relationship is generally not statistically significant. To clarify this host of results, it may be worthwhile to focus on evidence that controls for the national business environment and also potential reverse causality (IV results in Tables 2, 4, and 6).

Through this lens, the SME and ME prevalence appears to be positively related with economic growth in recent years (from 1997-2005), but at varying levels of statistical significance. This pattern does not hold for the full time period (1990-2005) and appears sensitive to the presence of outliers. The results of this study, as a whole, do not support a definitive determination that ME and SME prevalence positively affects economic growth.

4. CONCLUSION

This study was designed to explore the relationship between the prevalence of micro, small, and medium enterprises and economic growth. It is the first empirical study to examine cross-country evidence at the level of micro enterprises using an updated and expanded database on formal manufacturing firms.

The study finds no evidence at the micro and small enterprise level of a positive association between ME prevalence and economic growth. At the level of medium firms (with 250 employees or fewer) there is some sustained evidence of a positive, causal relationship that is distinguishable from a chance pattern during the 1997 to 2005 time period.

In sum, the evidence in this cross-country setting provides very limited support for a direct, causal relationship between MEs or SMEs and economic growth. This is not to say, however, that MEs and SMEs are without benefit to the economic development of a country.

The empirical results presented in this study must be accompanied with some cautionary notes. First, the sample consists of employment in formal manufacturing firms only. In many developing countries, the informal and non-manufacturing sectors are a major source of employment, especially in rural areas. To the extent that these firms are important to national growth, the present study may underestimate the contribution of micro and small enterprises to growth. A suggested avenue for future research is to develop data on ME and SME prevalence beyond the manufacturing sector, particularly for an expanded pool of developing countries, to permit a broader level of inquiry into firm size prevalence and economic growth.

Second, the cross-country data, which are averages across the time periods, can paint only a static picture of the manufacturing sector. The causal link that is seen in some models at the 250 employee cutoff, but not for smaller firm size cutoffs, with economic growth may well reflect the fact that firms of this size were successful MEs who have grown up. The role of the ME sector as an incubator for such firms, and thus as a contributor to growth, would be missed in the static picture. Another component of the MCME project, the dynamism study, has examined this in more detail. [23]

Third, the macro view of this analysis misses the micro pathways by which MEs may contribute to manufacturing output and economic growth. This may include linkages in sector-specific value chains where MEs may function as a valuable supply base for SMEs. These were studied in two field settings (Bangladesh and Peru) in another component of the MCME project.

Therefore, this study should not be interpreted as justification for curtailing ME or SME programs. Other pathways may still tie MEs and SMEs to strong economic performance. Other elements of the MCME project shed light on these other pathways by which MEs and SMEs may contribute to economic development.

[23] See Ayyagari, M., and Maksimovic, V., "Industry Growth, Firm Size, and the Business Environment," USAID MicroREPORT.

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