Volume 6, Special Issue 2, 2007 **ISSN 1544-0222**

JOURNAL OF INTERNATIONAL BUSINESS RESEARCH

An official Journal of the
Allied Academies, Inc.

Special Issue Co-Editors

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Whitney Press, Inc.

Printed by Whitney Press, Inc.
PO Box 1064, Cullowhee, NC 28723
www.whitneypress.com

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JOURNAL OF INTERNATIONAL BUSINESS RESEARCH

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LETTER FROM THE EDITORS

It is with great pleasure that we welcome you to this issue of the *Journal of International Business Research*, a journal published by the Allied Academies to support the exchange of ideas and insights in International Business.

This issue features the best papers from those presented at the Guam 2007 International Conference on Business, Economics and Information Technology on the theme of *"Doing Business in the Global Economy: Economic, Political, Social and Cultural Environments Facing Business."* Founded on a simple idea, that there is much we can learn from each other, the conference provided a opportunity for academicians, researchers, students, and representatives from industry and government to get together and exchange ideas in the spirit of scholarship and professional growth.

We thank Alfred University's College of Business, Penn State-Altoona's Division of Business and Engineering, and the University of Guam's School of Business and Public Administration for their support of this conference and the publication of this journal issue. We are also grateful to the Allied Academies for providing us with the outlet by which we can share our scholarly efforts.

Consistent with the editorial practice of the Academy on all 17 journals it publishes, each paper in this issue has undergone a double-blind, peer-review process.

Information about the Allied Academies, the *JIBR*, and the other journals published by the Academy, as well as calls for conferences, are published on the Allied Academies website, which is constantly updated with the latest activities of the organization. Please visit that site and know that the Academy welcomes hearing from you at any time, as do we.

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ECONOMIC AND POLITICAL ENVIRONMENTS AND THEIR EFFECTS ON FOREIGN DIRECT INVESTMENT

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ABSTRACT

This paper is a study of economic and political factors that affect foreign direct investments. The importance of these factors to international businesses and international managers' decision to operate in foreign markets has given rise to a number of statistics that attempt to measure different aspects of the business environment, including those being studied in this paper. We use regression analysis to study the determinants of foreign direct investment. In our analysis, alternative models, each using different measures of economic and political factors, will be estimated in order to test the robustness of our (and previous) empirical results to the choice of proxies for economic and political factors used in the estimation.

INTRODUCTION

Daniels, Radebaugh and Sullivan (2007) pointed out how important it is that managers of international businesses have an understanding of "social science disciplines and how they affect all functional business fields" (pages 21-22). International managers need a working knowledge of basic social sciences—political science, law, economics, geography, and behavioral sciences (anthropology, sociology and psychology)—to understand the different environments around the world under which businesses operate and to decide how much adjustment to make in their business practices in order to adapt to the area or region where business transactions take place. Similarly, the survey of American multinational CEOs by Ball and McCulloch (1993) suggested that an expertise in the area of political relations and international economics is an important consideration when hiring college graduates from business schools (pages 387).

The main analytical framework employed by Daniels, et al. throughout their book identified the following types of operating environments: cultural, legal, ethical, social, political and economic. In chapter 1, they introduced the following modes of international business: importing and exporting, tourism and transportation, licensing and franchising, turnkey operations, management contracts, foreign portfolio investment, and foreign direct investments (henceforth, FDI).

This paper is an attempt to identify and quantify operating environments that are important to international businesses. Among several operating environments discussed in Daniels, et al. and other similar textbook in International Business, this paper will focus on economic and political environments; and among alternative forms of international business, this paper will focus on foreign direct investment. Hence, this paper is a study of the effects of economic and political environments on businesses' decision to undertake direct investments in a foreign country.

REVIEW OF THE LITERATURE

The interest in foreign direct investments in general and in their determinants, in particular, is not new. The literature goes back years ago to many classic papers, which include those by Dunning (1973), Caves (1971) and Wilson (1916). Given the focus of this paper, the review of the literature has paid more attention on previous empirical work on the topic, especially on what other scholars considered to be significant determinants of foreign direct investments.

Jalilian (1996) identified three main variables that affect a firm's decision regarding foreign investment: differences in production efficiency between home and host countries; costs associated with technology transfer; and any cost or benefit which may arise from the differences in the production environment between home and host countries. Of particular relevance to our study is the third variable. As Jalilian noted (page 322), "the source of these costs or benefits… could be due to the general economic variables or those of cultural, legal and political institutions."

The paper by Chan et al. (1990) used vector auto regression analysis on Taiwan's data to evaluate alternative hypotheses regarding the causal relationship among state entrepreneurship, foreign investment, export expansion, and economic growth as suggested by the developmentalist, dependency and statist perspectives (see summary in Table 1, page 107). All three perspectives identified export expansion and economic growth to positively affect foreign investments. In addition, two perspectives (i.e., developmentalist and statist) viewed state entrepreneurship to negatively affect foreign investments.

Their results did not find support for the above hypotheses. Instead, they found that, for Taiwan during 1952-1987, foreign investments are largely determined by its own past values. As a side note, they found no support for claims that foreign investments promoted Taiwan's economic growth and that Taiwan's state entrepreneurship was neither a cause nor a consequence of foreign investments (page 125).

Nigh and Schollhammer (1987) argued that " foreign direct investors react more strongly to negative developments in the political environment (developments which investors perceive as hindering the achievement of the profit or other goals of the organization) than they do to positive developments" (page 307), hence, their "Asymmetric Response Hypothesis". This hypothesis must be considered in specifying the econometric model. Nigh and Schollhammer used an interactive dummy variable to capture the essence of their hypothesis. Their paper was narrowly focused on

FDIs originating from Japan. In addition to using political variables (e.g., intra and inter-nation conflict and cooperation), the authors incorporated relevant economic variables (e,g, market size using real GDP and market growth of the host country). They also separated FDI host countries into developed/advanced countries (DCs) and developing countries (LDCs) and found that, for DCs, they found both intra and inter-conflict/cooperation variables as statistically significant, with investors responding symmetrically to inter-conflict/cooperation and asymmetrically to intra-conflict/cooperation. For LDCs, they found that only intra-nation conflict is statistically significant and that Japanese investors respond asymmetrically in the opposite manner: Japanese investors respond more strongly to a decrease in intra-national conflict (page 310). No explanation was provided for this result.

The papers by Brewer (1993) and Pindyck and Solimano (1993) focused on the role of economic policies and their effect on FDI or aggregate investment, respectively. In his paper, Brewer provided a conceptual framework for a more comprehensive analysis of the effects of different types of government policies on market imperfections and in turn on FDI. In particular, Brewer identified types of government policies according to whether they affect market imperfections directly or indirectly, positively or negatively, and broadly or narrowly in scope (pages 107-111). He also noted the need to decompose FDIs into the following components: initial investment decisions, reinvestment decisions, and capital repatriation decisions for both inbound FDIs and outbound FDIs (page 111; see also Table 5, page 115).

Brewer classified government policies according to whether each policy increases or decreases market imperfections and whether these market imperfections increase or decrease FDI, hence yielding four categories of government policies: (1) those that increase market imperfections and in turn increase FDIs; (2) those that decrease market imperfections and in turn increase FDIs; (3) those that increase market imperfections and in turn decrease FDIs; and (4) those that decrease market imperfections and in turn decrease FDIs (see Figure 1, page 112). For each category, Brewer provided examples in his paper (see Tables 1-4, pages 112-114). Note that Brewer's study was intended to provide a theoretical framework but did not itself undertake an empirical analysis.

In Brewer's review of the theoretical literature on FDI, he noted a strand that focuses on economic conditions and/or government economic policies as important locational factors affecting firms' FDI decisions. Some of these studies are thus related to Dunning's third explanatory condition for FDI, i.e., the locational advantages of particular countries (page 106). He also noted that "to the extent that market size is a factor explaining FDI flows, monetary and fiscal policies become important, as well as government budget priorities that affect demand for goods and services in some sectors of the economy (page 106). Other variables identified as important determinants of FDI are cross-national differentials in the rates of return on financial capital and government exchange rate policies in that "FDI flows into countries with low real currency values, and it flows out of countries with high currency values" (page 107).

Pindyck and Solimano argued that because aggregate investments are irreversible (there are sunk costs) and time-flexible (i.e., they can be delayed), they become very sensitive to uncertainty over their future rate of return or expected profitability of investment. Consequently, the authors pointed to the importance of stable and credible macroeconomic policies in the short to intermediate term. They proceeded to construct an econometric model that looked at the negative impact of economic instability (as above noted), as well as political instability, on future expected profitability and consequently on aggregate private investment.

Regressions were run for the period 1962-1989 for all 29 countries and also for LDCs and OECD countries separately. Results for LDCs confirm the hypothesis that the more volatile is expected profitability, the lower is private investment. The reverse result was found for OECD but no explanation was provided.

Pindyck and Solimano also investigated economic and political variables that affect the volatility of expected profitability by calculating simple correlations between volatility and each of the following economic and political measures of instability: inflation, variability in inflation, variability in real exchange rate, variability in real interest rates; probability of a change in government, assassination, government crisis, strike, riot, revolution, constitutional changes. In its initial regression runs, the authors found inflation, variability in inflation and variability in real interest rate to be significantly correlated with volatility in future rates of return on capital. They also found that aggregate private investments in LDCs are more responsive to political instability than they are in DCs. In cross-sectional regressions, the authors found that inflation "is the only variable that is consistently significant as an explanator of profitability volatility." (page 295) and that "as long as a government can control inflation—an indicator of overall economic stability, and from which exchange rate and interest rate stability tend to follow—it can limit the uncertainty that matters for investment." (page 296). Hence, "stabilizing inflation is a precondition for a resumption of investment in an economy that has undergone a period of high price instability." (page 295)

Although the Pindyck and Solimano paper looked at aggregate investment, not FDI, it continues to be relevant to our study because both aspects of aggregate investment identified by Pindyck and Solimano apply to FDIs, our variable of interest, as well as a third aspect, i.e., the greater mobility of FDIs in that they can easily move across national borders as compared to domestic investments that might have an "attachment" to the home country. As a result, one would expect FDIs to be even more volatile and sensitive to economic and political instability and their impact on future rates of return.

Several papers reviewed provided a greater emphasis on political variables as determinants of FDIs. After reviewing the theoretical literature on FDI, Brewer (1993) concluded that there is widespread recognition, although implicit, that government policies are important determinants of FDI (page 107). As such, Brewer suggested "the integration of political risk studies into FDI theory" (page 114).

Knack and Keefer (1995) argued that the political instability variables by Gastil/Freedom House and used by Barro (revolutions, assassinations, etc.) are insufficient proxies for the quality of institutions that protect property rights, which is of prime consideration for investors, especially foreign investors. In their paper, they constructed two measures: International Country Risk Guide (ICRG) and Business Environmental Risk Intelligence (BERI). Each of these two variables, along with other variables, served as explanatory variables for private investment and economic growth. Using their private investment regression equation (page 220) and regressing it against alternative measures of political instability, they showed that their political institution variables, ICRG or BERI, have a statistically significantly negative impact on private investment while the Gastil/Freedom House and Barro variables did not.

De Haan and Siermann (1996) studied the effect of political instability and political freedom on economic growth and investment rate. Again, although the authors did not focus on FDI, their study's focus on political factors and their effects on investment can easily be extended to FDI, our variable of interest in this paper. The authors estimated a regression model with the investment rate as the dependent variable and political instability and/or political freedom as one of the independent variable(s). The political instability variable was proxied by the total number of government changes while the political freedom variable was defined as a dummy variable based on Gastil's political rights index where values range from 1 to 7, see Freedom House) (pages 341-342). Regression results were obtained using data for the period 1963-1988 for all 97 countries, as well as for countries in Africa, Latin America, and Asia. Their results suggest that political instability negative impacts investment rate in Africa and Asia. One can improve upon the De Haan and Siermann model by replacing the political freedom dummy variable with the actual values/scores of the political rights index.

The paper by Sinn et al. (1997) studied the low FDI inflows to Eastern Europe and cited a number of reasons for this outcome, including the lack of supporting legal and institutional framework, insufficient funds for complementary public infrastructure, substantial economic and political risk faced by investors. However, their main focus was on the political resentment by the local population which arises from FDIs acquisition of state assets that were sold as part of the privatization program. "Selling state assets to foreigners is often seen as" tantamount to "selling the family silver" (page 180). In discussing the Sinn et al. paper, Frey (1997) noted that "a large number of scholars have undertaken careful econometric analyses of the determinants of FDI, paying particular attention to political instability and political risk as a restricting factor." (page 199).

A particular example of a political factor that affects FDIs is the actual or perceived level of corruption in the host country. Azfar et al. (2001) suggested that there are two ways of empirically evaluating the impact of corruption on economic development: one using micro-data and the other using macro-data that allow for a comparison of the economic performances of countries with different levels of corruption (page 46). The latter is relevant to this paper. Azfar et al. noted that all measures of corruption are subjective but fortunately, these measures are strongly correlated.

They made reference to Mauro's (1995) index of bureaucratic inefficiency which was regressed against the investment rate or per capita GDP growth. Mauro found that bureaucratic inefficiency reduced the investment rate and in turn GDP growth. "Corruption is especially harmful (to investment and growth) because of the element of unpredictability it introduces into business transactions." (page 50).

Wei and Shleifer (2000) used regression analysis to investigate the effect of bureaucratic corruption on the volume of inward FDI, controlling for the effect of FDI-oriented government policies such as those discussed by Brewer. The authors used bilateral FDI flows, corruption indexes such as The Economist's ICRG and the World Bank's Global Competitiveness Report (GCR) and World Development Report (WDR), and FDI-oriented government policies from PricewaterhouseCoopers' country reports, from which authors constructed an index. Although the authors noted that using bilateral FDI flows is better than using aggregate FDI flows, our paper will use the latter because these data are more readily accessible than are those for bilateral FDIs.

Another example of a political factor that affects FDI is the host country's level of democracy. Barro (1999) set out to test the Lipset/Aristotle hypothesis that prosperity stimulates democracy. He used a rescaled version of Gastil/Freedom House indexes of political right and civil liberties. He constructed a democracy equation with past values of democracy, log of GDP, years of primary schooling, gender gap in primary schooling, urbanization rate, log of population, and oil country dummy as explanatory variables. Barro's results confirm the Lipset/Aristotle hypothesis, as well as other hypotheses (democracy decreases with the gender gap in primary education, urbanization and greater reliance on natural results and has no relation with country size). In this paper, an attempt will be made to introduce a democracy variable as a determinant of FDI. In addition to the indexes used by Barro, we will also use the democracy index published by the Economist Intelligence Unit (EIU).

Table 1 summarizes the different independent variables used by authors reviewed above while Table 2 summarize the different measures of investment used as dependent variables as well as the country sample included in previous studies.

Table 1: Economic and Political Variables Used in Previous Studies

Explanatory Variables	Author(s) & Year	Effect on Dependent Variable (* means "indirect" effect)
ECONOMIC VARIABLES		
Real GDP	Nigh & Schollhammer (1987)	+
Real GDP Growth	Nigh & Schollhammer (1987)	+/-
	Chan et al. (1990)	+
	Knack & Keefer (1995)	+

Table 1: Economic and Political Variables Used in Previous Studies		
Explanatory Variables	**Author(s) & Year**	**Effect on Dependent Variable (* means "indirect" effect)**
Log of Real GDP	Barro (1999)	+ *
	Wei & Shleifer (2000)	+
Log of Real GDP per capita	Wei & Shleifer (2000)	+
1960 Real GDP per capita	Mauro (1995)	-
Export Expansion	Chan et al. (1990)	+
Inflation	Pindyck & Solimano (1993)	- *
Variability in Inflation	Pindyck & Solimano (1993)	- *
Variability in Real Exchange Rate	Pindyck & Solimano (1993)	- *
Variability in Real Interest Rate	Pindyck & Solimano (1993)	- *
	Wei & Shleifer (2000)	-
Real Exchange Rate (under-/over-valuation)	Brewer (1993)	- / +
Real Government Spending	Knack & Keefer (1995)	Not specified
	Mauro (1995)	-
Government deficit/GDP	Wei & Shleifer (2000)	-
Deviation of investment price from US level	Knack & Keefer (1995)	- (implied)
	Mauro (1995)	-
GOVERNMENT POLICIES		
Government policies that affect market imperfections	Brewer (1993)	+ / -
Corporate tax rates	Wei & Shleifer (2000)	-
FDI restrictions	Wei & Shleifer (2000)	-
FDI incentives	Wei & Shleifer (2000)	+
POLITICAL VARIABLES		
Intra-nation conflict / cooperation	Nigh & Schollhammer (1987)	- / -
State entrepreneurship	Chan et al. (1990)	-
Probability of change in government	Pindyck & Solimano (1993)	- *
Assassinations	Pindyck & Solimano (1993)	- *
	Knack & Keefer (1993)	-
	Barro (1999)	- *
	Mauro (1995)	-
Government crisis	Pindyck & Solimano (1993)	- *
Riots	Pindyck & Solimano (1993)	- *

Table 1: Economic and Political Variables Used in Previous Studies		
Explanatory Variables	**Author(s) & Year**	**Effect on Dependent Variable (* means "indirect" effect)**
Strikes	Pindyck & Solimano (1993)	- *
Revolutions	Pindyck & Solimano (1993)	- *
	Knack & Keefer (1993)	-
	Barro (1999)	- *
	Mauro (1995)	-
Constitutional Change	Pindyck & Solimano (1993)	- *
International Country Risk Guide (ICRG), a composite score of quality of the bureaucracy, corruption, rule of law, expropriate risk and repudiation of contracts by government	Knack & Keefer (1993)	-
Business Environmental Risk Intelligence (BERI), a composite score of bureaucratic delays, nationalization potential, contract enforceability, and infrastructure quality	Knack & Keefer (1993)	-
Political Freedom, a composite score with"1" being best and "7" being worst	De Haan & Siermann (1996)	-
	Barro (1999)	- *
Civil liberty, a composite score with"1" being best and "7" being worst	De Haan & Siermann (1996)	-
	Barro (1999)	- *
Political Freedom and Civil liberties, individual scores are added together ("2" is best; "14" is worst)	Knack & Keefer (1993)	-
Political resentment/privatization/"selling family silver"	Sinn et al. (1997)	-
Corruption	Wei and Shleifer (2000)	-
	Mauro (1995), also one of three indicators making up his Bureaucracy Efficiency variable and nine variables making up his Institutional Efficiency variable	-
U.S. Source Effect (an interactive dummy that multiplies corruption and dummy=1 if bilateral FDIs originated from the US)	Wei & Shleifer (2000)	-
Corruption-related arbitrariness	Wei & Shleifer (2000)	-
Bureaucratic Efficiency, a simple average of three variables: judiciary system, corruption and red tape	Mauro (1995)	-
Institutional Efficiency, a simple average of nine variables from the Economist Intelligence Unit index	Mauro (1995)	-
Political stability	Mauro (1995)	+
Regulatory	World Bank	+

Table 1: Economic and Political Variables Used in Previous Studies		
Explanatory Variables	**Author(s) & Year**	**Effect on Dependent Variable (* means "indirect" effect)**
Rule of Law/Property Rights	World Bank	+
Democracy Index, based on 60 indicators: electoral process and pluralism, civil liberties, functioning of government, political participation, and political culture ("10" being best and "0" worst)	The Economist Intelligence Unit	+
OTHER VARIABLES		
Years of primary schooling	Barro (1999)	+
Primary education in 1960	Mauro (1995)	+
Secondary Education	Mauro (1995)	+
Gender gap in primary school	Barro (1999)	- *
Urbanization	Barro (1999)	- *
Log of population (=population growth)	Barro (1999)	+ *
	Mauro (1995)	-
Oil country dummy	Barro (1999)	+ *
Log of distance between host/home country	Wei & Shleifer (2000	-
Linguistic tie	Wei & Shleifer (2000	+
Quality of Accounting Standards	Wei & Shleifer (2000)	+
* Pindyck and Solimano used the above variables as correlates of expected capital profitability, which is then the determinant of aggregate private investment. For Barro, the above variables were used to explain, which we then use as an explanatory variable for FDI inflows.		

THE EMPIRICAL MODEL

The regression equation is

$$FDI = a_0 + a_{1i}\, ECON_{1i} + a_{2j} POL_{2j} + a_{3k}\, DUM_{3k} + e$$

where FDI is a measure of inbound foreign direct investments, ECON is a vector of variables that represent the economic environment of the host country; POL is a vector of variables that represent the political environment of the host country, DUM is a vector of dummy variables, e is the error term, i, j, and k are indices that correspond to individual economic, political, and dummy variables.

Table 2: Dependent Variable, Time Period, and Country Groups in Previous Studies	
Author(s) & Year	Dependent Variable, Time Period, Income Groups
Nigh & Schollhammer (1987)	FDIs from Japan, 1948-1978, DCs and LDCs
Chan et al. (1990)	Foreign Investment in Taiwan, 1952-1987
Pindyck & Solimano (1993)	Private Investment/GDP, ---, DCs and LDCs, also by region
Brewer (1993)	Inbound FDIs and Outbound FDIs, decomposed into initial investment, reinvestment and repatriation of profits, not an empirical study (instead, it provided a theoretical framework for conducting an empirical study)
Knack & Keefer (1995)	Private Investment/GDP, 1970-1989
Mauro (1995)	Aggregate Investment/GDP, also decomposed into Private Investment/GDP and Public Investment/GDP, 1960-1985, also by region
De Haan & Siermann (1996)	1963-1988
Sinn et al. (1997)	Eastern Europe (not an empirical study)
Barro (1999)	Democracy, 1960-1995
Wei & Shleifer (2000)	Bilateral FDI flows, cross-section using 1994-96 averages

The Sample

Cross-section data of 164 countries, of which 36 are developed countries (DCs) and 128 are developing countries (LDCs). This classification made use of the World Bank's income groups where DCs consist of OECD and high-income countries and LDCs consist of the remaining countries. Note that, depending on which variables are used in the regression, observations might not be available for some countries and the regression program makes the necessary adjustments for missing data.

The Dependent Variable

As Table 2 shows, previous studies have used different measures of investment. In our study, we focus on FDI and used FDI-GDP ratio as our dependent variable, defined as inbound FDIs as a proportion of the host country's income, as measured by Gross Domestic Product (GDP). Inbound FDIs data are taken from UNCTAD (2006) and represent the average over the 2000-2005 period. The nominal GDP is taken from World Bank (2006).

Table 1 offers some guidance on what variables would be included in the ECON, POL and DUM vectors based on what other authors previously used in their studies. The deciding factor on which variables were actually included and used in the analysis was dictated by the availability of data in general and for the period and countries of interest in this study in particular.

Economic Environment Variables

The economic environment variables used in this study are listed below, along with the source of information:

Heritage Foundation's Economic Freedom Index (a composite score of ten indicators of market-orientation) and some of its ten indicators, averaged over the 2001-2006 period ("1" being best and "5" being worst). Of the ten indicators of market orientation, the following areas reflect the economic environment (others reflect the political environment and are hence noted below): Trade, Fiscal Burden, Monetary Policy, Foreign Investment (relabeled as "FDI incentives"), Banking and Finance, Wages and Prices (relabeled as "Price and Wage Rigidity"), and Informal Market.

Heritage Foundation's Income Tax Rates and Corporate Tax Rates for the year 2006

International Monetary Fund's average and standard deviation of CPI-inflation (relabeled as "inflation" and "inflation volatility", respectively), average real GDP growth and standard deviation, average population growth, average current account balance/GDP ratio, all data calculated over the 2000-2005 period. Real GDP is available in both Purchasing Power Parity (PPP) values and also in terms of real national currency.

Percent-change in real exchange rate from Heston, Summers and Aten (2006), with real exchange rate defined as the each country's currency-U.S. dollar nominal exchange rate multiplied by the ratio of U.S. GDP deflator to each country's GDP deflator, averaged over the 2000-2003 period.

Exports-GDP and Imports-GDP ratio for the year 2004, taken from UNDP (2006).

World Economic Forum's Global Competitiveness Index for the year 2006

Political Environment Variables

Similarly, the political environment variables are listed below as well as the source of such information:

Gastil/Freedom House's Political Rights and Civil Liberty Scores, each averaged over the 2000-2005 period (for each, "1" is best and "7" is worst)

World Bank's Governance Indicators (Political Stability, Government Effectiveness, Regulation, Law and Corruption), averaged over the period 2000-2005, scores between -2.5 and +2.5, with "2.5" being best and "-2.5" being worst

The Economist Intelligence Unit's Democracy Index and its five components (electoral process and pluralism, functioning of the government, political participation, political culture, and civil liberties) for the year 2006, with "10" being best and "0" being worst

Select components of the Heritage Foundation's Economic Freedom Index such as Government Intervention, Property Rights, and Regulation, averaged over the 2001-2006 period.

Exports-GDP and Imports-GDP ratio for the year 2004, taken from UNDP (2006).

Dummy Variables

The two dummy variables used in the study are as follows, along with the source of such information:

OECD-high income country= 1; otherwise 0, based on World Bank's income classification

Fixed exchange rate=1; otherwise 0, based on IMF's Exchange Rate Arrangement classification. Similarly, another dummy is defined for flexible exchange rate=1; otherwise 0. Hence, the first dummy will identify countries with fixed exchange rate regimes, the second dummy will identify countries with flexible exchange rate regimes, and those excluded from either category will be those countries whose exchange rate systems are in-between, i.e., neither fixed nor flexible.

Other Explanatory Variables

Other explanatory variables used in the study are as follows as well as the source of such information:

Population growth rate, taken from the World Bank (2006), averaged over the 2000-2005 period

Urban population (as percent of total population) for year 2004, Income Share of Richest 10% relative to the Poorest 10% (a measure of income inequality) for various years, Net Primary Enrollment ratios for all population and decomposed for male and female for the year 2004, Female-male earned income ratios for the year 2004, all taken from UNDP (2006)

The above regression equation is estimated using Ordinary Least Squares and processed through Eviews 4.

Because the above regression model is so general and does not tell us specific economic and political variables matter, multiple regression runs were performed in order to identify the best models (whose results are reported in Tables 3-6). These models were "best" when judged primarily but not exclusively on the basis of the value of the adjusted R-squared, F-statistics and how well coefficients supported test hypotheses based on existing theories. Throughout the regression runs, we take some comfort in the fact that explanatory variables are highly correlated, although this multicollinearity is not perfect. This implies that, if one economic or political variable does not add explanatory power to the model, a similar result is obtained even when that economic or political variable is replaced by another economic or political variable. In this context, we suggest that our results are robust and that, overall, they are unchanged by the choice of economic and/or political variable used in the regression.

Note also that tests were undertaken to ensure that the model was specified using correct functional forms, that variables were transformed when necessary (for example, real GDP data in levels were replaced by data in growth rates), and that the White test was used to correct for heteroskedasticity problems.

THE RESULTS

This section provides a highlight of our regression results, keeping in mind that these results represent the "best" model specification from among multiple regression attempts. However, because these models are associated with low R-squared, although the F-value for each is statistically significant at 10% or better, caution must be exercised in interpreting the results reported below.

The regression results reported below comprise of those from three sets of regressions: (1) using the full sample that combined data from LDC and DC host countries; (2) using LDC data only; and (3) using DC data only.

Basic, more direct, objective, readily available economic indicators perform better than composite economic indexes or scoring systems as determinants of FDIs. Using the full sample that combined DC and LDC data, regression results reported in Table 3 show real GDP growth, index of openness (measured by the sum of exports and imports divided by GDP), and inflation rate (in

this case, marginally, as the p-value slightly exceeds the 10% significance level) to affect FDIs in the way theory suggests. Alternative regression runs that made use of economic indexes (such as the Economic Freedom Index or the Global Competitiveness Index) in place of standard macroeconomic indicators yielded no or lower statistical significance for these indexes as determinants of FDIs.

Other variables that significantly affected FDIs for all countries in the sample are the extent of urbanization (as measured by the ratio of urban population to total population), the dummy variable for high income countries, and the degree of government intervention but the last two results require further clarification. The result in Table 3 suggests that that high income host countries are associated with a lower FDI-GDP ratio but we suspect that this result is sensitive to the fact the FDI has been defined in relation to GDP. As such, this ratio tends to go down as the host country's income increases. With regard government intervention, the results show that some level of government intervention would attract FDI inflows up to a certain point, after which FDI inflows decrease as government intervention continues to increase.

Our results fail to show strong support for the importance of political variables (in this case, proxied by political stability) as a determinant of FDI inflows. In fact, after multiple runs, the best result we could obtain is that reported in Table 3, where the host country's political stability positively affected FDI inflows at a significance level of 12%, exceeding the standard level of 10% or less.

Table 3: Regression results using full sample (combined DC and LDC data)
Dependent Variable: FDI-GDP ratio
Method: Least Squares, with White Heteroskedasticity-Consistent Standard Errors & Covariance Included
observations: 143

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-13.8153	3.8782	-3.5623	0.0005
Fixed Exchange Rate (Dummy=1)	0.5813	0.6599	0.8810	0.3799
High income host country (Dummy=1)	-2.4510	1.2858	-1.9062	0.0588
Real GDP Growth	0.2145	0.1183	1.8135	0.0720
Degree of Government Intervention	7.2091	2.4127	2.9880	0.0033
Degree of Govt Intervention-Squared	-1.2023	0.3680	-3.2666	0.0014
Log of Inflation rate	-0.5806	0.3612	-1.6073	0.1104
Index of Openness	0.0344	0.0085	4.0464	0.0001
Political Stability	-0.9496	0.6126	-1.5501	0.1235
Urban Population/Total Population	0.0756	0.0177	4.2706	0.0000
R-squared	0.2793	F-statistic		5.7275
Adjusted R-squared	0.2306	Prob(F-statistic)		0.0000

Next, the regression model was estimated using data for LDC host countries only. The results, reported in Table 6, are very similar to those obtained for the full sample, partly because LDC data make up a large share of the full sample. In particular, the results show that FDI inflows were influenced by standard macroeconomic variables such as real GDP growth rates and index of openness. One noteworthy difference between the regression results of the full sample (as reported in Table 3) and those using data from LDC host countries only is that, in the latter, composite economic index such as the Economic Freedom Index was also found to be a statistically significant determinant of FDI inflows. This may be because there is greater deviation in this index's value among LDCs and that the inclusion of DC data in the full sample dampens this deviation and hence makes this explanatory variable statistically insignificant in the regression using DC data only or the full sample.

Demographic variable such as the urban population in proportion to total population was also found to significantly affect FDI inflows to LDCs. In this case, urbanization could be proxying both demand factors (for example, the proportion of the population who are economically active and earning incomes) as well as supply factors (the availability of infrastructure such as roads and power supply).

The sign on one political/governance variable, proxied by government effectiveness in this regression model, was the opposite of what one would have expected, which suggests that host countries with less effective governments tend to attract more FDIs. This result might be capturing the scenario that when local governments are less effective and more arbitrary, foreign companies are still able to make profits (sometimes substantial) if they have local partners or consultants who are well-connected with the government and are able to find loopholes.

Inflation rates, fiscal burden and population growth, although not statistically significant at a 10% significance level, would have been significant at around 12% significance level. The political rights variable (reported in Table 4) or the political stability variable (result not reported) are surprisingly not significant determinants of FDI inflows to LDC host countries.

Lastly, the regression model is estimated using data for DCs host countries only. After performing tests of multicollinearity, correct functional forms and heteroskedasticity, and then estimating several regression models of different specifications, it became clear that the Openness variable is the variable that most significantly explains FDI inflows into DCs. This variable accounts for approximately one-third of the variability in the FDI-GDP data in DCs (see Table 5). Given that our data set is cross-section, we are unable to determine the direction of a causal relation between Openness and FDI inflows, however, we have reasons to believe that the causal relation is bidirectional, that is, higher FDI inflows into a host country leads to greater openness (=greater trade in goods and services) in that country and, at the same time, a more trade-oriented country tends to attract more FDIs. This reflects the fact that both FDI inflows (and outflows, for that matter) and trade, equivalently, mobility of capital and goods and services, respectively, are reflections of how a host country gets integrated into the global economy.

Table 4: Regression results using LDC data only				
Dependent Variable: FDI-GDP ratio				
Method: Least Squares with White Heteroskedasticity-Consistent Standard Errors & Covariance Included observations: 117				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	2.8023	4.0388	0.6938	0.4893
Economic Freedom	-3.4045	1.2311	-2.7653	0.0067
Fiscal Burden	1.3570	0.8744	1.5520	0.1236
Real GDP Growth	0.2939	0.1530	1.9205	0.0575
Degree of Government Effectiveness	-2.0206	1.0700	-1.8885	0.0617
Inverse of Inflation	1.2279	0.7811	1.5719	0.1189
Index of Openness	0.0292	0.0093	3.1226	0.0023
Population Growth	-0.4940	0.3217	-1.5356	0.1276
Urban Population/Total Population	0.0439	0.0156	2.8058	0.0060
Political Rights	0.0937	0.2084	0.4494	0.6541
R-squared	0.2873	F-statistic		4.7924
Adjusted R-squared	0.2273	Prob(F-statistic)		0.0000

In running the regression whose result is reported in Table 5, the test for multicollinearity was performed. This test suggests that the Openness variable is not highly collinear with other explanatory variables, with the highest correlation of 58% present with the FDI incentives variable, that is, more open, trade-oriented host countries tend to have more favorable FDI incentives.

Table 5: Regression results using DC data only				
Dependent Variable: FDI-GDP ratio				
Method: Least Squares with White Heteroskedasticity-Consistent Standard Errors & Covariance Included observations: 35				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	6.2990	2.5127	2.5068	0.0173
Inflation rate	-1.0368	1.0220	-1.0144	0.3178
R-squared	0.0640		F-statistic	2.2581
Adjusted R-squared	0.0357		Prob(F-statistic)	0.1424

Table 6: Regression results using DC data only				
Dependent Variable: FDI-GDP ratio				
Method: Least Squares with White Heteroskedasticity-Consistent Standard Errors & Covariance Included observations: 30				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-1.2513	1.4381	-0.8701	0.3916
Index of Openness	0.0479	0.0117	4.0751	0.0003
R-squared	0.3723		F-statistic	16.6067
Adjusted R-squared	0.3499		Prob(F-statistic)	0.0003

Our result differs substantially from the results found by Pindyck and Solimano (1993), that inflation rate is the most important determinant of aggregate investment. In fact, Table 6 below shows inflation rate to be an insignificant determinant of FDI inflows into DC host countries, with the t-statistics -1.01 and a very low adjusted R-squared of 0.03. Recall, however, that Pindyck and Solimano's result was based on their use of aggregate investment, not just FDI. That inflation appears to be a more important consideration for domestic investors than for foreign investors might reflect the fact that inflation changes are partially or fully offset by nominal exchange rate changes, thereby reducing inflation's negative effect on FDIs.

CONCLUSION AND SUGGESTION FOR FUTURE RESEARCH

We found that basic, direct and readily available economic variables such as standard macroeconomic indicators, including real GDP growth, index of openness, and inflation rates performed best in explaining FDI inflows. Composite indexes and scores that represent indirect, often subjective measures of host countries' economic environments such as the Economic Freedom Index and Global Competitive Index did not fare well as determinants of FDIs.

Because the political variables we used in this study are all composite indexes and scores and hence are not as useful in regression analysis, we found no support for most models and only weak support, at best, for the importance of political environments in attracting or driving away FDIs. Previous studies that used more direct measures of the political environment (such as Nigh and Schollhammer (1987), Pindyck and Solimano (1993) and Barro (1999) who used the conflict, cooperation, assassinations, revolutions, strikes, riots, no name a few) found political environments to be important determinants of FDI inflows. One seems to be faced with the challenge of choosing between, on the one hand, proxies of political environments that are multidimensional and hence captures a broader picture (possible, "too much noise") and, on the other hand, proxies that are narrower in focus and representing only a few select events. We reveal our preference by the political variables we chose to use in this study, although more narrowly-defined governance

variables such as degree of government intervention or government effectiveness were also used in this study and yielded stronger results.

One possible direction of future research on this topic might incorporate cultural factors and their effects on FDIs. To some extent, this hypothesis was investigated in this study where some cultural variables were included in some of our regression runs. For cultural variables, we made use of host countries' scores in Hofstede's five cultural dimensions: individualism-collectivism; masculinity-femininity; power distance; uncertainty avoidance; and long-term orientation (data taken from www.geert-hofstede.com/hofstede_dimensions.php). None of these regression runs found support for any of these cultural dimensions to be important determinants of FDIs, again contrary to what theory and experience purport (regression results are not reported here). We suspect that the same problem with political variables applies to the cultural variable, i.e., they are subjective measures, usually based on a scoring system and on surveys of samples that are too small to be reliable. Also, these cultural variables are available for a smaller number of countries, which reduces the sample size in our regression.

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HUMAN RESOURCE MANAGEMENT PRACTICES OF U.S. SUBSIDAIRES IN TAIWAN: A COMPARATIVE STUDY WITH LOCAL TAIWANESE FIRMS

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ABSTRACT

In this study, we compare the human resource management practices of U.S. subsidiaries in Taiwan to those of their parent firms and to those of large Taiwanese companies in an effort to understand how foreign subsidiaries adjust to the competing demands for global integration and local responsiveness. The results indicate that Human Resources Management (HRM) is not a uniform function, but consists of practices that differ in their relative resemblance to local practices and to parent practices. This suggests that the competing demands for global integration and local adaptation should not be viewed as opposite ends of a continuum, but as two independent dimensions. Placing these demands on opposite axes, we propose a global integration-local adaptation matrix with four basic combinations of HR practices: universal, global, unique and local. This matrix recognizes the realities of a global economy where success may require balancing the competing demands for global integration and local adaptation resulting in HR practices in subsidiaries that are unique both to the parent firm and to the local environment. It also recognizes the internationalization of management resulting in universal HR emerging practices.

INTRODUCTION

The study of comparative management practices has received much attention over the past thirty years. When U.S. Multi-National Corporations (MNCs) invest abroad, they usually introduce their management practices, along with production technology, into less developed countries. Inevitably, they face problems relating to cultural differences. Thus, subsidiaries and joint ventures face conflicting pressures from the parent firm and the local environment (Rosenzweig & Singh, 1991).

HR practices are considered important management tools in the U.S. (Gomez-Mejia, Balkin & Cardy, 2007). To understand how the foreign subsidiaries of MNCs adjust to the competing demands for global integration and local responsiveness, in this study we compare the HR practices of U.S. subsidiaries in Taiwan to those of their parent firms, and to those of large Taiwanese manufacturers.

THEORETICAL BACKGROUND

Local Adaptation versus Global Integration

Early research on MNCs focused on the reasons why MNCs exist and what leads to foreign investment decisions. These early investigations neglected to consider how MNCs are best organized. More recently, a central management issue for MNCs is the degree to which they adapt to the foreign host's environment versus the degree to which operations are integrated across borders (Prahalad & Doz, 1987, Rosenzweig & Singh, 1991). The integration-adaptation framework has provided a useful model for analyzing MNCs (Doz & Prahalad, 1991). Following this model, the subsidiaries of MNCs face pressures for both local adaptation and global integration when they operate in foreign countries. Regarding the management of human resources, the parent firm either can allow the policies within each overseas subsidiary to develop according to local values and practices, or can attempt to integrate policies between the parent firm and its subsidiaries (Taylor & Beechler, 1993).

The growing trend among MNCs is to leverage organizational practices across their international subsidiaries in order to improve the worldwide use of their organizational skills as an important source of competitive advantage. Consistent behavioral routines through organizational practices enable MNCs to reduce transaction costs, particularly regarding the coordination and integration of their international corporate network. While the globalization of organizational practices in MNCs seems economically rational in order to increase transnational coordination and efficiency, the heterogeneous institutional, cultural and organizational contexts in which the foreign subsidiaries MNCs operate require the local adaptation of organizational practices so that legitimacy and acceptance by local stakeholders can be maintained. This tension between the need for global integration of organizational practices and their local adaptation poses important challenges to today's MNCs.

In this paper, we report the results of a study comparing HR practices of U.S-based MNCs in Taiwan to those of their parent firms and to those of large Taiwanese companies in an effort to understand how foreign subsidiaries adjust to the competing demands for global integration and local responsiveness. Specifically, we investigate what kinds of HR practices are predominantly transferred as standardized routines, and which are subject to local adaptation.

Research Hypotheses

The global integration/local adaptation framework is useful for assessing the relative strengths of integration and adaptation pressures across various levels: across industries, across firms competing within industries, across nation origin, and even across functions or task within an organization. Human resource management covers a wide span of activities and decision areas ranging from industrial and labor relations to personnel functions affecting all levels of an organization (Lengnick-Hall & Lengnick-Hall, 1988). However, decisions concerning key affiliate managers, such as selection, compensation and benefits, training and development, and performance appraisal are singled out as being particularly important for multinational corporations (Edstrom & Lorange, 1984). Thus, HR practices that contribute to aligning the MNC toward global integration are more likely to receive a similar level of emphasis in both the parent and subsidiary. Specifically, we hypothesized that:

Hypothesis 1: *Performance appraisal practices are more likely to receive a similar level of emphasis in both the parent and subsidiary.*

Hypothesis 2: *Training and development practices are more likely to receive a similar level of emphasis in both the parent and subsidiary.*

As a subsidiary matures and grows, its success may depend more on how well it fits into its local environment than on how much support it receives from its parent firm (Doz & Prahalad, 1988). Thus, personnel practices that contribute to the subsidiary's smooth business operation in the host country are more likely to receive a similar level of emphasis in the subsidiary as among local manufacturers. Specifically, we hypothesized that:

Hypothesis 3: *Recruiting and selection practices are more likely to receive a similar level of emphasis in both the foreign subsidiaries of MNCs and local manufacturers.*

Hypothesis 4: *Compensation and benefit practices are more likely to receive a similar level of emphasis in both the foreign subsidiaries of MNCs and local manufacturers.*

Taken together, the resulting tests of these hypotheses will provide insights into how U.S. multinational corporations with manufacturing subsidiaries in Taiwan address the competing demands for local responsiveness and global integration within their HR practices. Specifically, few

significant differences in the emphasis placed on HR practices between parent and subsidiary would indicate global integration, while few significant differences in the emphasis placed on HR practices of subsidiaries and local Taiwanese manufacturers would indicate local adaptation. However, few significant differences in the emphasis placed on HR practices between the parent and subsidiary, and subsidiary and local Taiwanese manufacturers would indicate that such practices were universal. Finally, significant differences in the emphasis placed on HR practices between parent and subsidiary, and subsidiary and local Taiwanese manufacturers would indicate that the practices of the subsidiary are unique to both the parent firm and to the local environment, perhaps reflecting a balancing of the competing demands for global integration and localization within the subsidiary.

METHODS

Sources of Data

A stratified random sampling scheme was employed to ensure that HR practices of manufacturing firms in similar industry sectors were compared. To accomplish this, a complete list of the U.S. manufacturing subsidiaries operating in Taiwan was obtained from the Investment Division of the Ministry of Economy in Taiwan. From this list, every other firm listed within the six most popular sectors for investment – Food & Beverage Processing, Chemicals, Rubber & Plastics Products, Basic Metals & Metal Products, Machinery Equipment, and Electronic & Electric Appliances – was surveyed – 326 firms in all. Furthermore, from the list of Taiwan's 1,000 largest manufacturing enterprises based on annual sales compiled by Common Wealth Magazine (2006, May) every other firm within the same six sectors – 359 firms in all – were surveyed. One hundred and sixty-six questionnaires were retuned, 72 from U.S. subsidiaries and 94 from locally owned Taiwanese companies, yielding response rates of 22.09%, and 26.18% respectively. As the study was limited to subsidiaries in which the parent company had over 50% equity in their Taiwanese operations and to firms with 100 or more employees, the useable sample was composed of 50 U.S. subsidiaries and 85 locally owned manufacturers.

Data Collection Procedures

Each subsidiary general manager on the mailing list was sent an envelope containing the following items: a cover letter explaining the nature of the study and requesting the cooperation of the general manager or the head of human resources (HR), a copy of the appropriate questionnaires, and a self-addressed, stamped envelope for returning the questionnaire. The questionnaire was prepared in two languages. The questionnaire was first developed in English and then translated into Chinese, then back translated. The questionnaires were revised to make the questions clearer, and

then were mailed out. U.S. subsidiaries were sent the English and the Chinese versions, while Taiwanese firms were sent only the Chinese version.

A mail survey was chosen over other ways of gathering data because of the wide geographical dispersion of companies, the required speed of data collection, and the length of the questionnaire. The general manager or head of HR was asked to respond on behalf of each subsidiary, as they were the managers in the firm most likely to have work experience in both the parent and subsidiary firm and thus best able to compare parent and subsidiary HR practices. In the Taiwanese firms, the head of HR was asked to respond on behalf of the company.

Survey Instrument

The respondents from the U.S subsidiaries were asked to what extent the use of 52 HR practices in the areas of recruitment and selection (15), compensation and benefits (13), training and development (12), and performance appraisal (12) were emphasized in their subsidiary and in their parent firm. The respondents from Taiwanese manufacturers were asked to what extent the HR practices assessed were emphasized in their company only. The executives responded on a Likert scale ranging from 0 (Never emphasized) to 7 (Heavily emphasized). The HR practices assessed were from a survey instrument originally developed by Robinson (1994; 1995) to study the personnel practices of U.S. subsidiaries operating in Japan.

Statistical Analysis

The methods used to analyze the collected data to achieve a two-way comparison were as follows:

1. Ratios, means and standard deviations were calculated to describe the nature and characteristics of variables.
2. As many of the populations sampled were not normally distributed, traditional statistical methods were not suitable. Instead, the non-parametric two related samples test (Wilcoxon Signed-Rank test) was employed to examine the differences between the U.S. parent company and its manufacturing subsidiary in Taiwan.
3. The non-parametric two independent samples test (Mann-Whitney U) test was also employed to examine the differences between the U.S. manufacturing subsidiary in Taiwan and the local Taiwanese manufacturers.

RESULTS

Performance Appraisal Practices

Table 1 displays the mean responses for the U.S. parent firms, their subsidiaries, and local Taiwanese manufacturers, for each of the performance appraisal practices assessed. Note that U.S. subsidiaries placed a similar emphasis as their parents, but significantly less emphasis than local Taiwanese manufacturers on "Merit pay/bonus allocations" and "Development of abilities". This would indicate global integration of these particular practices.

Table 1: Differences between the Performance Appraisal Practices of U.S. Parent Companies, their Manufacturing Subsidiaries in Taiwan and Local Taiwanese Manufacturers

Performance Appraisal Practice	US Parent Mean	Significant difference	US Subsidiary Mean	Significant difference	Taiwanese Firm Mean	Conclusion
Formal systems of appraisal	5.42	n. s.	5.54	n. s.	5.67	Universal
Informal systems of appraisal	5.12	n. s.	5.28	n. s.	5.12	Universal
Numerical performance indicators	5.50	n. s.	5.30	n. s.	5.52	Universal
Subjective judgment in performance appraisal	4.52	n. s.	4.40	n. s.	4.48	Universal
Self-assessment evaluations	4.70	n. s.	4.70	n. s.	4.59	Universal
Long-term performance indicators	5.38	n. s.	5.52	n. s.	5.16	Universal
Multiple measures of performance	4.90	$p<.05$	4.72	$p<.05$	4.60	Unique
Management by objectives system	6.04	$p<.05$	5.82	$p<.05$	5.26	Unique
Performance standards	6.14	$p<.05$	5.64	n. s.	5.87	Local
Merit/pay bonus allocations	4.56	n. s.	4.48	$p<.05$	5.45	Global
Clarifying performance expectations	5.12	$p<.05$	4.76	n. s.	5.14	Local
Development of abilities	4.74	n. s.	4.68	$p<.05$	5.46	Global

The US subsidiaries also placed significantly less emphasis than their parents - but a similar level of emphasis as local Taiwanese manufacturers on "Performance standards" and "Clarifying performance expectations". This indicates responsiveness to the demands for local adaptation in these practices.

It should also be noted that the U.S. parent companies placed significantly more emphasis on "Multiple measures of performance" and "Management by objectives" than their subsidiaries did. The U.S. subsidiaries, in turn, placed significantly more emphasis on these practices than the local Taiwanese manufacturers surveyed. This suggests that U.S. subsidiaries sometimes balance the competing demands for global integration versus local responsiveness when performance appraisal practices that are strongly emphasised by their parent firms receive significantly less emphasis in the local environment.

Finally, all three organizations placed a similar emphasis on the following performance appraisal practices: "Formal system of appraisal"; 'Informal system of appraisal"; "Numerical performance indicators"; "Subjective judgment in performance appraisal"; 'Self-assessment evaluations"; and "Long-term performance indicators". This suggests that these practices may be universal and clearly supports the overall conclusion that the performance appraisal practices of U.S. multinational corporations and their subsidiaries are much more alike than dissimilar to those of local Taiwanese manufacturers.

Thus, support was obtained for Hypothesis 1, in that the U.S. manufacturing subsidiaries in Taiwan surveyed placed significantly less emphasis than their parent firms on just 33.33 per cent (4/12) of the performance appraisal practices assessed, which would indicate global integration. However, the responses of the U.S. subsidiaries also varied significantly from those obtained from local Taiwanese manufacturers on 33.33 per cent (4/12) of the performance appraisal practices assessed. This would indicate local responsiveness. Overall, these findings indicate that the performance appraisal practices of U.S. multinational corporations and their subsidiaries are much more alike than dissimilar to those of local Taiwanese manufacturers. This suggests that many performance appraisal practices may be universal.

Training and Development Practices

Table 2 displays the mean responses for the U.S. parent firms, their subsidiaries, and local Taiwanese manufacturers, for each of the training and development practices assessed. Interestingly, the U.S. subsidiaries did not place a similar emphasis as their parents, but a significantly different emphasis than local Taiwanese manufacturers, on any of the practices assessed. Thus, none of the training and development practices assessed showed signs of global integration.

It should also be noted the U.S. subsidiaries placed significantly more emphasis on "Formal mentoring programs" than both their parents did and the local manufacturers surveyed. In other

words, the US subsidiaries placed a unique emphasis on this particular training and development technique.

Table 2: Differences between the Training and Development Practices of U.S. parent Companies, their Manufacturing Subsidiaries in Taiwan and Local Taiwanese Manufacturers

Training & Development Practice	US Parent Mean	Significant difference	US Subsidiary Mean	Significant difference	Taiwanese Firm Mean	Conclusion
In-house classroom	4.78	p<.05	5.06	p<.0001	5.85	Unique
Informal coaching by supervisors	5.34	p<.05	5.56	n. s.	5.45	Local
Outside classroom training	4.82	p<.05	5.28	n. s.	5.38	Local
Individual development plans	4.62	n. s.	4.68	n. s.	4.86	Universal
Creativity enhance-ment training	4.24	p<.05	4.36	p<.05	4.86	Unique
Technical knowledge training	5.78	n. s.	5.66	n. s.	5.66	Universal
General problem-solving training	5.06	n. s.	4.96	n. s.	5.33	Universal
Interpersonal skills training	4.86	p<.05	4.62	n. s.	4.94	Local
Foreign language training	4.74	n. s.	4.90	n. s.	4.66	Universal
Formal mentoring programs	5.08	p<.05	5.38	p<.05	4.93	Unique
Entry-level training	5.22	p<.05	5.46	n. s.	5.28	Local
International training	4.68	p<.05	3.92	n. s.	4.31	Local

The local Taiwanese manufacturers placed significantly more emphasis on “In-house classroom training” and “Creativity enhancement training” than the U.S. US subsidiaries surveyed. The U.S. US subsidiaries, in turn, placed significantly more emphasis on these practices than their parent firms did. This suggests that US subsidiaries may balance the competing demands for local responsiveness versus global integration when training and development practices that are strongly emphasized in the local environment receive significantly less emphasis in their parent firms.

All three types of organizations placed a similar level of emphasis on the following training and development practices: “Individual development plans”; “Technical knowledge training”; “General problem-solving training”; and “Foreign language training”. This suggests that these training and development practices may be universal.

Finally, the U.S. US subsidiaries placed significantly less emphasis than their parents - but a similar level of emphasis as local Taiwanese manufacturers - on the following training and development practices: “Informal coaching by supervisors”; “Outside classroom training”; “Interpersonal skills training”; “Entry-level training”; and “International training”. This clearly supports the overall conclusion that U.S. multinational corporations with manufacturing subsidiaries in Taiwan are very responsive to the demands for local adaptation in their training and development practices.

Thus, Hypothesis 2 was rejected, in that significant differences were found in the training and development practices between the U.S. parent companies and their manufacturing subsidiaries in Taiwan. Specifically, significant differences in emphasis between parent and subsidiary were found on 66.67 per cent (8/12) of the training and development practices surveyed. This indicates a lack of global integration in training and development practices. In addition, the responses of the U.S. subsidiaries varied significantly from those obtained from local Taiwanese manufacturers on just 25 per cent (3/12) of the training and development practices assessed, thereby indicating local responsiveness. Taken together, these findings indicate that the training and development practices of U.S. multinationals are very responsive to the demands for local adaptation.

Recruitment and Selection Practices

Table 3 displays the mean responses for the U.S. parent firms, their subsidiaries, and local Taiwanese manufacturers, for each of the recruitment and selection practices assessed. Note that for only one practice - “General learning abilities” - did U.S. subsidiaries place a similar level of emphasis as their parents, but significantly more emphasis than did local Taiwanese manufacturers. This would indicate global integration for this particular practice.

All three types of organizations placed a similar emphasis on “Recruitment from other companies”, “Objective skills tests”, “Creativity” and “Ability to fit into the firm”. This suggests that these recruitment and selection practices may be universal in that companies operating in different environments give them similar emphasis.

The local Taiwanese manufacturers placed significantly more emphasis on “Recruitment from schools” and “Compliance” than the U.S. subsidiaries surveyed. The U.S. subsidiaries, in turn, placed significantly more emphasis on these practices than their parent firms did. This suggests that U.S. subsidiaries sometimes are able to create a unique balance between the competing demands for local responsiveness versus global integration when recruitment and selection practices that are

strongly emphasized in the local environment receive significantly less emphasis in their parent firms.

Table 3: Differences between the Recruitment and Selection Practices of US Parent Companies, their Manufacturing Subsidiaries in Taiwan and Local Taiwanese Manufacturers

Recruitment & Selection Practice	US Parent Mean	Significant difference	US Subsidiary Mean	Significant difference	Taiwanese Firm Mean	Conclusion
Recruitment from schools	2.66	p<.05	4.22	p<.05	5.27	Unique
Recruitment from other companies	4.68	n. s.	4.88	n. s.	4.34	Universal
Recruitment from within company	4.58	p<.0001	5.86	n. s.	5.81	Local
Objective skills tests	4.68	n. s.	4.90	n. s.	5.24	Universal
Personality tests	3.68	p<.05	4.02	n. s.	4.32	Local
Interviews by HR staff and managers	5.34	p<.05	5.88	n. s.	5.91	Local
References	3.18	p<.05	3.60	n. s.	4.12	Local
Recruitment from certain schools only	2.44	p<.05	2.64	n. s.	3.12	Local
Specific technical skills	5.32	p<.05	5.80	n. s.	5.58	Local
Creativity	4.96	n. s.	5.08	n. s.	5.31	Universal
General learning abilities	5.60	n. s.	5.82	p<.05	5.58	Global
Compliance	5.04	p<.05	5.42	p<.05	5.78	Unique
Ability to fit into the firm	5.16	n. s.	5.26	n. s.	5.11	Universal
Willingness to cooperate	5.18	p<.05	5.62	n. s.	5.78	Local
Willingness to work hard	5.00	p<.0001	5.58	n. s.	5.99	Local

Finally, the U.S. subsidiaries placed significantly less emphasis than their parents - but a similar level of emphasis as local Taiwanese manufacturers - on the following recruitment and selection practices: “Recruitment from within company”; “Personality tests”; “Interviews by HR

staff and managers"; "References"; "Recruitment from certain schools only"; "Specific technical skills"; "Willingness to cooperate" ; and "Willingness to work hard". This clearly supports the overall conclusion that U.S. multinational corporations with manufacturing subsidiaries in Taiwan are very responsive to the demands for local adaptation in their recruitment and selection practices.

Thus, strong support was obtained for Hypothesis 3 in that the U.S. manufacturing subsidiaries in Taiwan surveyed placed significantly more emphasis than their parent firms on 66.67 per cent (10/15) of the recruitment and selection practices assessed, indicating a low level of global integration. In addition, the responses of the U.S. subsidiaries varied significantly from those obtained from local Taiwanese manufacturers on just 20 per cent (3/15) of the recruitment and selection practices assessed, thereby indicating local adaptation. Taken together, these findings provide strong evidence that overall U.S. multinational corporations with manufacturing subsidiaries in Taiwan are very responsive to the demands for local adaptation in their recruitment and selection practices.

Compensation and Benefit Practices

Table 4 displays the mean responses for the U.S. parent firms, their subsidiaries, and local Taiwanese manufacturers for each of the compensation and benefits practices assessed. Note that on only one practice - "Formal job evaluations" - did all three organizations place a similar emphasis. This would indicate that this is a universal practice.

The U.S. subsidiaries also placed significantly less emphasis than their parents - but a similar level of emphasis as local Taiwanese manufacturers - on "Minimizing felt pay inequities". This indicates responsiveness to the demands for local adaptation of this practice. The U.S. subsidiaries also placed a similar level of emphasis as their parents, but significantly more emphasis than did local Taiwanese manufacturers, on the following practices: "Individual incentive plans"; "Group incentive plans"; "Extra pay for multiple skills"; "Paying above market compensation"; and "Providing above market benefits. This would indicate global integration on these particular practices.

Finally, the U.S. subsidiaries placed significantly less emphasis than both their parents and the local manufacturers surveyed, on the following practices: "Stock ownership plans"; "Rewards for efficiency"; "Rewards for innovation"; "Rewards for quality work"; "Rewards for personal development"; and "Rewarding high performers". This clearly supports the overall conclusion that the U.S. subsidiaries in Taiwan have adopted a unique approach to compensation and benefits, one significantly different in many respects from the practices of both their parents and local firms.

Thus, only moderate support was found for Hypothesis 4 in that the U.S. manufacturing subsidiaries in Taiwan surveyed placed significantly less emphasis than their parent firms on 55.85 per cent (7/13) of the compensation and benefits practices assessed, indicating a lack of global integration. The U.S. subsidiaries also placed significantly less emphasis than local Taiwanese

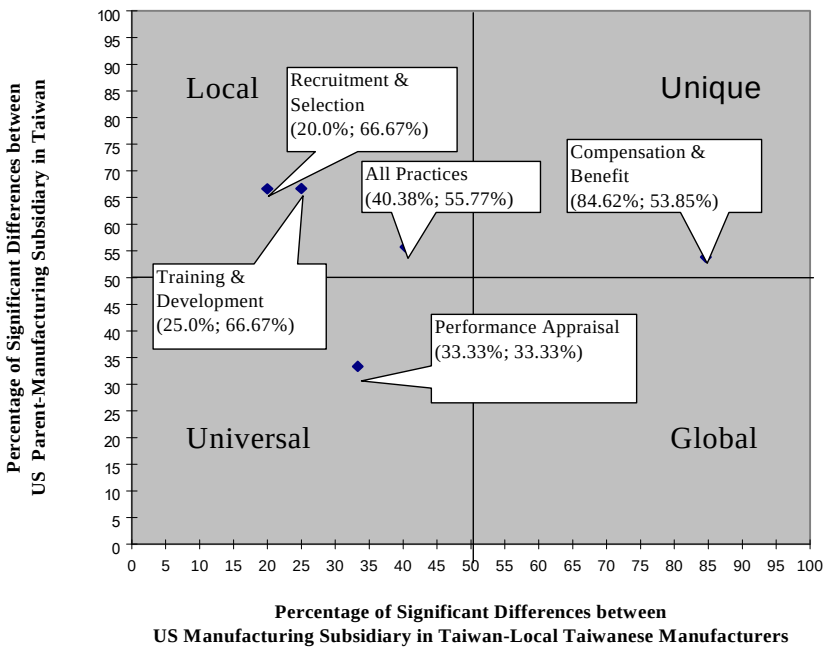
manufacturers on 84.62 per cent (11/13) of the compensation and benefit practices assessed, indicating a lack of local adaptation. Taken together, these findings suggest that the U.S. subsidiaries have adopted a unique approach to compensation and benefits, one significantly different in many respects from the practices of both their parents and local firms.

Table 4: Differences between the Compensation and Benefits Practices of U.S. Parent Companies, their Manufacturing Subsidiaries in Taiwan and Local Taiwanese Manufacturers

Compensation & Benefits Practices	US Parent Mean	Significant difference	US Subsidiary Mean	Significant difference	Taiwanese Firm Mean	Conclusion
Individual incentive plans	4.54	n. s.	4.16	p<.0001	5.48	Global
Group incentive plans	4.32	n. s.	4.48	p<.05	5.665	Global
Stock ownership plans	1.26	p<.05	0.98	p<.05	3.55	Unique
Formal job evaluations	5.26	n. s.	5.18	n. s.	5.51	Universal
Extra pay for multiple skills	3.86	n. s.	3.74	p<.05	4.91	Global
Rewards for efficiency	4.08	p<.05	3.88	p<.05	5.31	Unique
Rewards for innovation	3.74	p<.05	3.50	p<.0001	4.95	Unique
Rewards for quality work	3.68	p<.05	3.42	p<.0001	4.87	Unique
Rewards for personal development	3.44	p<.05	3.04	p<.05	3.99	Unique
Rewarding high performers	5.54	p<.0001	4.80	p<.05	5.56	Unique
Minimizing felt pay inequities	5.96	p<.05	5.70	n. s.	5.89	Local
Paying above market compensation	4.36	n. s.	4.26	p<.0001	5.24	Global
Providing above market benefits	4.82	n. s.	4.72	p<.05	5.41	Global

In Figure 1, the percentage of significant differences between the HR practices of the U.S. parent companies and their manufacturing subsidiaries in Taiwan are plotted against the percentage of significant differences between the HR practices of their subsidiaries and the local Taiwanese manufacturers surveyed. The resulting matrix explicitly recognizes that the competing demands for local adaptation and global integration should not be viewed as opposite ends of a continuum. Rather, the relationship between parent and subsidiary, and subsidiary and local practices should he viewed as two independent dimensions. Thus, the demands for global integration and local adaptation are placed on opposite axes. The resulting matrix reveals four basic combinations of HR practices: universal, global, unique and local. Along with local adaptation and global integration, this matrix recognizes the realities of a global economy where success may require the balancing of the competing demands for global integration and local adaptation resulting in subsidiary HR practices that are unique to both the parent firm and the local environment. It also recognizes the internationalization of management resulting in some universal HR practices emerging.

Figure 1
Global Integration versus Local Responsiveness of US Multinationals' HR practices



Overall, the results indicate that U.S. multinational corporations with manufacturing subsidiaries in Taiwan are more responsive to the demands for local adaptation than global integration in their personnel practices. Significant differences in emphasis between U.S. parent and subsidiary were found on 55.77 per cent (29/52) of the personnel management practices assessed, indicating a trend away from global integration. In addition, the responses of the U.S. subsidiaries varied significantly from those obtained from local Taiwanese manufacturers on 40.38 per cent (21/52) of the personnel practices assessed, indicating local responsiveness. In the areas of recruitment and selection, and training and development, there is a strong emphasis on the adaptation of practices to the local environment (i.e., local responsiveness). With regard to compensation and benefits practices, it appears that the U.S. manufacturing subsidiaries in Taiwan have adopted a unique approach, one significantly different in many respects from the practices of both their parents and local Taiwanese manufacturers. Finally, the performance appraisal practices of U.S. multinational corporations and their subsidiaries were found to be more alike than dissimilar to those of local Taiwanese manufacturers. This suggests that many performance appraisal practices are universal.

DISCUSSION

The findings of this study are significant because they add to our understanding of how the competing demands for global integration and local adaptation shape specific HR practices in foreign subsidiaries. Specifically, the demands for global integration and local adaptation were viewed not as opposite ends of a continuum, but as two independent dimensions in this study. The resulting matrix allowed subsidiaries' practices to be classified as *universal, global, unique,* or *local*. Let us consider the strategic implications of each of these categories.

In this study, universal practices were those that received a similar level of emphasis in parent, subsidiary and local firms. Universal practices reflect the internationalization of management. For example, it is not uncommon for Taiwanese managers (particularly the second generation of family owners of business groups) to hold MBA degrees from U.S. universities. As this generation rises in the managerial ranks, we are likely to see a shift in emphasis to U.S-style management practices. Obviously, such a trend towards the internationalization of management will make it easier for MNCs, particularly U.S-based multinationals, to maintain consistent HR policies and practices across national borders in the future.

Global practices were defined here as those that received a similar level of emphasis in both the parent and subsidiary, but a different level of emphasis in local firms. Rosenzweig and Nohria (1994) suggest that because employees may move among subsidiaries, MNCs have a desire to maintain a consistent set of HR policies and procedures. Even without an extensive exchange of personnel across borders, MNCs, for reasons of internal equity, still may wish to adopt a consistent set of HR practices across subsidiaries (Rosenzweig & Nohria, 1994). Little evidence of global

integration, however, was found in this study. While a MNC may have a strategic or moral imperative to maintain consistent HR practices across its various subsidiaries, the reality is that this is very difficult to do. HR practices are often mandated by local regulation or shaped by local customs. Moreover, since subsidiaries typically hire most of their employees from the local labor market, it is difficult for them to diverge much from local norms.

Unique practices were defined as those that received a different level of emphasis in the subsidiary than in either their parent or local firms. At times, this may be the result of the subsidiary balancing the competing demands for global integration versus local responsiveness when HR practices that are strongly emphasized in their parent company receive significantly less emphasis in the local environment (and vice versa). At other times, the subsidiary may place significantly more (or less) emphasis on practices that receive a similar level of emphasis in both their parent and local firms. Strict adherence to parent or local practices may not always in best practice from a strategic standpoint.

Finally, local practices were defined as those that received a different level of emphasis between parent and subsidiary, but a similar level of emphasis between subsidiary and local firms. From a strategic standpoint, the localization of HR practices may be the best way for the subsidiary of a MNC to attract, motivate, and retain competent employees in highly competitive local labor markets.

Suggestions for Future Research

International human resource management (HRM) involves the worldwide management of people (Tung, 1984; Miller, Beechler, Bhatt & Nath, 1988). Traditionally, it has focused on the recruitment and selection, training and development, performance appraisal, and rewarding of international personnel. The effectiveness of particular HRM approaches and practices depends directly on the firm's environment and strategy (Adler & Ghadar, 1989). The research agenda is clear. Management scholars must study international HRM within the context of changing economic and business conditions. Similarly, future research by management scholars should use multiple levels of analysis when studying international HRM such as the external social, cultural, historical, political and economic environment, and the industry setting. Specific recommendations for further research in these areas are presented below.

First, this study restricted its focus to U.S. multinational firms that generally fall under Bartlett and Ghoshal's (1989) headings of "international" firms. It would be interesting to see how "global" Japanese and "multinational" (European) firms adapt their HR practices given the competing demands for local responsiveness and global integration that they face.

Second, the encouraging nature of these findings could lead to the same method being used to replicate this study in other cultures in Southeast Asia, Latin America, and India. The results

obtained would provide more information about the effects of cultural differences on the operation of multinational companies.

Third, this study was limited to the manufacturing industry, and therefore the findings of this research provide only a partial understanding of the real dynamic of HR practices. The relevance of such a study would be greater if the data could be collected from a more comprehensive range of industries.

Finally, the extent to which the globalization-localization matrix developed in this study can be applied to functions other than HR management needs to be investigated. For example, could this matrix be used to develop a better understanding of the marketing, financial control, and manufacturing practices of foreign subsidiaries? While HR practices are the most likely to be strongly influenced by the demands for local adaptation, marketing and manufacturing practices may also tend to resemble local practices, although perhaps to a lesser degree. One would expect, however, that financial control practices would be shaped mainly by a need for internal consistency in the MNC and thus closely adhere to parent practices.

Limitations

Although the study sample was drawn from a large pool of U.S. manufacturing subsidiaries in Taiwan, and the local Taiwanese manufacturers were randomly selected from an established list, selection bias may remain as a threat to the validity of the study. This procedural difficulty inhibits the external validity of generalizing the results of a study to a larger population. Haire, Ghiselli, and Porter (1996) identified this factor as a threat to the validity of comparative studies dealing with business organizations. According to these authors, no truly complete lists of all the companies of a country from which a researcher might draw a genuinely random sample exist. An accompanying problem is that if such a random sample were drawn, there is no guarantee that all the selected companies would cooperate.

An additional limitation to this study is that the variables in HR practices are difficult to quantify in numerical terms. To minimize the effect of this limitation a scale of measurement was applied in the questionnaire design to define the variables in operational terms and this scale and definitions were used throughout the study.

Another limitation involves the biases that can come into play as a result of survey respondents who attempt to convey a favorable impression of their firm. Possible distortions of the data were reduced by checking responses against supporting documents and through other crosschecking techniques.

Finally, while a business organization is a highly dynamic organism and the environmental factors affecting it change over a time, a researcher can only perceive and document a snapshot image of the organization at an instant in time. In spite of the care taken in the collection and later in processing and interpretation of the data, this limitation to the study remains.

CONCLUSION

This study sought to determine how manufacturing subsidiaries of U.S.-based MNCs operating in Taiwan balance the competing demands of local adaptation and global integration in their HR practices. Our research findings indicated that the HR practices of U.S. subsidiaries generally tend to resemble local practices. Further analysis of the 52 HR practices assessed in this study, however, indicated that HRM is not a uniform function; it consists of practices that differ in their relative resemblance to local practices and to parent practices.

The primary contribution of the present study to international HRM is the recognition that the competing demands for local adaptation and global integration should not be viewed as opposite ends of a continuum. Rather, the relationship between parent and subsidiary (i.e., demands for global integration), and subsidiary and local practices (i.e., demands for local adaptation) should be viewed as two independent dimensions. This allows the demands for global integration and local adaptation to be placed on opposite axes. The resulting matrix reveals four basic combinations of HR practices: universal, global, unique and local. This conceptualization better fits the realities of a global economy where success may require the balancing of the competing demands for global integration and local adaptation resulting in HR practices in subsidiaries that are unique to both the parent firm and the local environment. It also recognizes the internationalization of managerial practices resulting in some universal HR practices. In an increasingly competitive global environment, companies are adopting strategic human resource management practices in order to enhance organizational adaptability and capability (Lengnick-Hall & Lengnick-Hall, 1988). More cross-cultural studies of this nature should enable organizations to develop better HRM policies for employees in international operations.

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PROJECT BREAKDOWN: PATTERNS OF FAILURE IN APPLICATION SOFTWARE IMPLEMENTATION

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ABSTRACT

This paper seeks to identify patterns that bring about failure in major application software implementations. The literature on such failures is reviewed to identify a common set of expected explanations for the failures. A group of forty real world application software implementation projects are then reviewed. Of these, six may be called failures. A brief case study of each failure is presented and explanations for the failure are identified. The explanations for these real world failures are then formally compared to the explanations identified in the literature and similarities and differences are noted. For this data set, there were differences between the expected set of explanations and the actual explanations identified. Most specifically, forms of technological failure were more common than expected from the study of the literature.

INTRODUCTION

As computer based technology has spread around the world, managements of large, complex organizations often acquire new application software from outside vendors to support change in a set of organizational processes. A project team is set up to study the new software, integrate it with existing processes, and implement it across the organization. When the new application is exceptionally complex, organization management frequently hires outside consultants to assist in the implementation. Some application software vendors, knowing the difficulties in bringing about complex process change, will even supply project consultants as part of an application software sale.

These external consultants work with the organization's project team to draw up a comprehensive project plan, provide basic training on software functionality, and advice on each step in the implementation efforts. Despite the best intentions and significant efforts within and without an organization, such efforts are at times unsuccessful and even at times can be identified as complete failures. This presentation seeks to analyze a set of implementation failures associated with a set of over forty software implementation efforts to see whether such failures are idiosyncratic cases or whether patterns can be found in such failures.

The study of failures presents a challenge. Few people are willing to talk about personal and institutional failures and bureaucracies of every type place warning flags in front of attempts to

reflect on bad institutional memories (Tuchman, 1978; Tuchman, 1981). Still there is a fascination with failure and a tradition of the study of failure especially in the field of engineering and politics (Petroski, 1994; Herring, 1989; Pressman & Wildavsky, 1973; Sheehan, 1971; Sheehan, 1988; Vaughan, 1996; Staw & Ross, 1987; Petroski, 1992; Nickerson, 1981; Dorner, 1996; Flyvbjerg, Bruzelius, & Rothengatter, 2003). Such studies can provide some of the personal and institutional humility that can lead to more realistic plans and efforts.

PROJECT MANAGEMENT

Project management is the art of making a plan operational (Lewis, 1995). As a result of successful project management:

- a bridge is built,
- a plane is designed, constructed and flown,
- a product is developed and brought to market,
- members of an organization change the way an important organizational process is carried out.

As a result of unsuccessful project management:

- The Koror-Babeldaob Bridge in Palau, a modern design pronounced ready to last another eighty-five years after major repairs, collapses within three months;
- The Challenger space shuttle blows up during a launch;
- Ford Motor Company builds the Edsel automobile and the Coca-Cola Company develops and markets New Coke.
- The City of Denver opens a massive new airport that requires automated central operation of the baggage system. After missing many deadlines and spending much money on automated baggage handling, the project is abandoned.
- Senior managers at a well known, wealthy, liberal arts college spend large sums of money to purchase a new budget and finance application, take over a year of time and effort to make it work, including paying for expensive custom software modifications, stand up in front of a national meeting to say how pleased they were with the new application software, then soon after abandon the effort because of a simple factor known from the very start of the project. A short distance away another, similar liberal arts college, at almost the same time, successfully purchases and quickly implements the same budget and finance application.

This paper will focus on application software projects of this last type.

No project team plans for failure and often the immediate explanation of failure has simplistic roots in a lack of knowledge. The impact of unknown stresses in the changes to the Palau bridge design and the way cold would affect the rubber seals of the Challenger shuttle were both unanticipated. Production personnel at Ford did not understand the lack of interest people had in a new full sized automobile and marketing personnel at Coca Cola did not understand the hold original Coke had on customers. The managers for the Denver Airport project did not understand the complexity of baggage handling. Finally business office personnel at the liberal arts college did not understand or accept the institutional changes that were necessary in switching from a five-digit fund account number to a four-digit number required by their new software.

REVIEW OF THE LITERATURE

In an early study Danziger (1977) finds that managers who do not understand information systems registered the most frustration with change processes and were the least optimistic about their implementation. In addition he finds that a significant proportion of managers, despite what they thought they had been told, did not find that the use of computers led to cost savings, to a reduction in personnel, to greater cooperation among departments or to better information for decision making. In the view of these managers, greater computer use did not lead to greater organizational efficiency. This analysis blames failures on both a lack of management understanding of how computers really work and on application software that does not do what was promised.

In another early study, Bostrom and Heinen (1977a; 1977b) begin development of a combined sociological-technical understanding of application software design and implementation. They review what then had been reported about MIS failures. According to their analysis, these early reports on software implementation failure cited problems resulting from applications that were developed without recognition of how persons in organizations behaved. The underlying assumption was that people can and will adapt to any design. These approaches blamed user limitations in the face of software inflexibility for software implementation failure. Instead Bostrom and Heinen propose a different understanding. They see application software technology as neutral. They trace software design and implementation failures to incorrect assumptions of application designers about people and how people function in organizations. They expand the understanding of MIS development to include the designers' implicit and explicit theories about who is responsible for the change effort as new application software is developed. In Bostrom and Heinen's view, application software designers typically invent methodologies that see users only as a mechanism for learning whatever is in a new software application. In their view application implementation failure comes about because software developers traditionally do not allow users to be full partners in the design and implementation process. To counter this tendency, Bostrom and Heinen advocate expanding the application design and implementation process to include users in a more

comprehensive way, building up during the effort an understanding of the larger social and organizational issues arising from the project.

Schmitt and Kozar (1978) analyzed the failure of the development of a new comprehensive, state geographic information application. In this case the state agency contracted with a state university for the development of the new application. Personnel in the two organizations had successfully cooperated on prior projects so at this time there was little formal agreement developed prior to the initiation of the project. Neither group had much experience in designing computer based information applications of this type. In effect agency managers turned total control of the project over to university personnel. Meanwhile personnel at the university saw the project as an opportunity to design a comprehensive research database. Unfortunately this kind of database required different information from that desired by the client. Because the state agency managers had abdicated the oversight role, the project quickly spun out of control. This approach found managerial failure leading to project failure.

Senn (1978b; 1978a) on the other hand blames application analysts rather than managers for the failures he has seen. In his view application analysts are too tied to technological solutions to see what is actually happening. In addition he finds that structures in an organization often reward the decision to change rather than reward the decision to stay with successful existing applications. This bias in favor of change leads to unnecessary effort.

Glennon (1978) returns the attention to management failures as an explanation of application implementation failure. In his view, the key problem is senior managers who do not give project managers a level of authority commensurate with their level of responsibility. He boldly says that this is the underlying reason for all application software development failures.

Staw et al. (1987) and Vaughan (1996) continue the theme of management failure by placing responsibility for failure on senior managers who do not develop a solid understanding of what is happening at the project level. They end up being sealed off from implementation processes because of their management position.

Ewusi-Mensah and Przasnyski (1991) add a nuance to the literature when they distinguish between MIS project failure and MIS project abandonment. In their view failure occurs when a project is completed but the resulting product is not utilized or substantially fails to meet project goals. Abandonment occurs when an organization's management terminates work on an ongoing development. Results of their survey are summarized in Table 1. While the authors indicate that abandonment has been little studied, it is clear that many of the earlier studies of failure included abandoned projects within their focus. The authors of this study reinforce the view that lack of management support and the negative behavior of personnel in organizations lead to project abandonment. Table 1 summarizes these views.

Table 1: Reasons for MIS Project Abandonment	
Projected Reasons	Survey Results
Importance of project to the organization.	Not a significant factor; both strategically important and less important projects were abandoned.
Schedule slippage.	Minor factor
Cost overruns.	Minor factor
MIS Technology advances beyond the project.	Minor factor
Lack of senior management support.	General agreement that corporate management was supportive at the start; strong agreement that organizational politics and managerial disagreements about a project led to abandonment.
End user expectations not being met.	All projects encouraged end user participation and user training; however certain projects threatened end users and led to end user conflict.
Lack of familiarity with new MIS technology being used	Minor factor
Disagreements within the project group.	Strongly rejected as a cause of abandonment.
	Ewusi-Mensah and Przasnyski (1991)

Starting in the mid 1990's, MIS theorists began to identify project escalation as a specific form of project failure (Flyvbjerg et al., 2003; Keil, 1995; Montealegre & Keil, 2000; Keil, Mann, & Raiffa, 2000). These authors noted that many software application projects spin out of control, have significant cost overruns, and take much longer to complete than originally planned. The authors hold that projects that are abandoned for these reasons form a separate class of failure.

The literature review finds most authors identify multiple but different causes as the source of failure (Schmitt and Kozar, 1978). Most, but not all, find some level of blame in a lack of leadership and direction from senior management. Some studies find failure caused by organizational politics. Others find fault with project managers and the analysts. Studies were often limited because they only identified single cases or were primarily theoretical in scope. However taken together, these studies provide a list of reasons that can be used in the analysis of real world situations. This list is summarized in Table 2.

Table 2: Summary of Reasons from Literature for Project Failure	
Projected Reasons	Study Source
MIS designs that do not take into account the behavior of personnel in organizations.	Early studies; Senn (1978)
Inflexible MIS designs.	Early studies; Senn (1978).
Incorrect assumptions by designers about personnel in organizations.	Bostrom and Heinen (1977a; 1977b); Senn (1978).
Managerial expectations not being met by MIS.	Danziger (1977).
MIS Technology advances beyond the project.	Ewusi-Mensah and Przasnyski (1991).
Lack of senior management support; poor management leadership.	Ewusi-Mensah and Przasnyski (1991); Schmitt and Kozar (1978).
Project managers lack authority commensurate with responsibility.	Glennon (1978).
End user expectations not being met.	Ewusi-Mensah and Przasnyski (1991).
Lack of familiarity with new MIS technology being used.	Ewusi-Mensah and Przasnyski (1991).
Disagreements within the project group.	Ewusi-Mensah and Przasnyski (1991).
Significant escalation of cost or time to completion.	Keil 1995; Keil, Mann, and Rai 2000; Montealegre and Keil 2000; Flyvbjerg, et al. 2003.

REAL WORLD CASE DESCRIPTIONS OF IMPLEMENTATION FAILURE

The author of this study worked as an external consultant on over forty project implementations of a comprehensive online, real time budget and financial accounting application. In this paper the software application is named the Budget and Financial Application or BFS. These implementations were carried out at colleges and universities. The great majority of these projects were successful when success is defined as going live with the new application within two years of purchase and using the software through the first annual close and audit without major incident. However six of the efforts may be classified as failures. Several of these institutions took five or more years to implement the software and two totally abandoned any effort to implement the application.

The project activities at each of these institutions will be reviewed and they will be compared against the list of reasons for failure drawn up from the literature review. This will help validate whether a generalized set of explanations for failure is reflected in a real world set of failures.

Western State University System (WSU)

The Western State University System was responsible for a diverse range of public institutions including several major state universities and several community colleges. State board personnel initiated this project effort to build the institutional capacity needed to manage the financial operations of both the whole university system and the individual institutions. After determining the need for a common, software based, administrative application, the project was then driven by a cost centered mind set into a set of poor decisions. Early on, senior board personnel decided there would not be enough funds to carry out the implementation along lines that those close to the project considered the "right" way. Board staff concluded that an IBM mainframe solution was just too expensive for the state but they still believed they had to have common administrative software. Therefore central office personnel accepted a proposal from another computer hardware company looking to rescue its computer business. Since the computer company still had a market selling research computers to universities, senior management at the computer company concluded they could also easily enter the college and university market for administrative applications. The computer company contracted with the state board to provide a mainframe computer, and an online, real time budget and financial application. The computer company then contracted with the software company that supplied the CFS software, asking them to convert the software company's budget and financial applications to the computer company's mainframe technology.

A "skunk works" in California handled the product conversion. The conversion was well done despite the risks inherent in moving software from one computer design to a different computer architecture. Unfortunately the computer company was not wealthy enough to provide the resources to support basic user needs such as the development of a common terminal interface using the company's own communication technology. The lack of a standard reliable user interface and common communication standards became a constant problem during the implementation. In addition it became apparent that the software company's design techniques for transaction processing and the computer company's roots in research and math modeling did not mesh well. The company's mainframe bogged down when handling any large volume of online transactions and the operating system was not well structured to handle the processing of large, complex, transaction files, especially those with multiple indexes. This author was privileged to attend several high-level computer company meetings on the topic. Eventually the project was put out of its misery and the computer company finally exited from the computer business. Some years later the state board decided it had to purchase a application that ran on IBM mainframes and went out looking for a student registration application. That is another story.

While much of the failure here was the result of technological problems, and the inability of the computer company to place sufficient technical resources on resolving the problems, much blame can be placed on state board personnel who put only a computer center technician and an assistant controller in charge of the whole project. While higher-level personnel verbally supported

the project, none appeared to really understand what was going on and what needed to happen for the project to be a success.

Famous New England Liberal Arts College (NELA)

This college purchased an IBM version of the BFS budget and finance application. Because of the size of the endowment portfolio, college personnel were really more interested in developing a new online endowment management application. The existing budget and accounting application was home grown and utilized a five-digit fund code whereas the standard application sold by the software vendor utilized a four-digit code. College personnel wanted a standardized budget and financial application so institutional MIS would no longer need to support modifications of the existing financial applications. In addition, well endowed as the college was, college personnel did not want to pay to convert the BFS Budget and Financial Application from a four to a five-digit fund code.

This created a fundamental accounting problem. College personnel were used to managing each endowment gift as a separate, self-balancing set of real and nominal accounts, something that required a separate fund number for each endowment. The challenge was to design an endowment management application as part of the BFS financial application, providing self-balancing, real account information, without also providing a five-digit fund number for each endowment. The software company brought one of its best designers to the project. He chose to use the very latest in MIS application design methodology. A comprehensive application was designed and coded within the parameters set for the project. Based on their initial use of the endowment application, college personnel made a highly positive presentation about the new endowment application at a national meeting.

Completion of the design and coding effort for the endowment subsystem led to a new reality. Now decisions had to be made about a new institutional chart of accounts structure and much of the data from the old applications had to be translated and entered into the new application. In addition the controller at the college needed to lead the business office personnel in learning and implementing the other basic business and finance components of the new application. This proved to be a difficult task for the controller. Eventually the controller paid to have outside consultants flown in regularly to do the data entry. Software company personnel would sit and do data entry while regular employees traded recipes and grocery coupons. Business office personnel did not develop familiarity in using online terminals and resistance to the new application developed. Upon reviewing the situation, college managers decided to abandon the project and have their MIS staff modify their existing endowment application to meet the perceived need for a five-digit fund number.

Here a project was done in by a sense of institutional uniqueness, unwillingness to deal with change, and an inability to provide leadership in a business office situation. The project was finally

brought to close with an under the table agreement that neither party knew the other. Interestingly at almost the same time, another nearby liberal arts college with almost the same size endowment portfolio bought the exact same budget and financial software with the endowment subsystem. Under more difficult technical constraints the software was implemented in a short period of time.

Upper Midwest State University System (MSUS)

This was a BFS budget and financial implementation at a large, complex university system dominated by a single major state university. One of the issues leading to the call for a new application was a series of institutional scandals that had led to a loss of faith in public higher education in the state. The institution had remarkably limited business office experience. At the time there were only five CPA's in an organization that was spending over a billion dollars a years. Even the CPA's lacked experience and at one point the project manager had to teach them how to do basic retail accounting for bookstores. The person nominally in charge of the project was an associate vice president with limited business experience who was concerned with promoting women as administrators. She bailed out of the project soon after it started. A chief accountant (who regularly reminded others of membership in a national group for the very intelligent) was charged with responsibility for developing the chart of accounts. There was no output from those efforts.

An expensive software based purchasing application had been acquired in the previous year. Initially university personnel specified an interface with the new purchasing application even though the budget and finance application came with its own purchasing application that was the equivalent of the stand-alone purchasing application. In addition the client decided to build an interface with an antiquated batch payroll application that duplicated a number of functions in the new business and finance application. Finally computer center personnel decided to implement the application utilizing a newly released, untested, database management application. The project was careening out of control with a lack of central leadership and focus.

Some years later I interviewed personnel at one of the medium sized universities in the system. They had finally gone live on the budget and financial software after making extensive modifications that have made it impossible to implement updated versions of the BFS budget and financial software. The school had just completed a major revision to the chart of accounts because their initial design was so poorly done. The biggest complaint was about a lack of leadership and guidance from central office personnel responsible for the implementation.

Southwest Religious College (SWRC)

This was one of the largest colleges of its kind in the whole world. The mission of this college was to educate students who wanted to become ministers in a strong, Christian, religious tradition. The administrators had a great sense of dedication and loyalty. Many of the students were

hired to work at the college to help make up for the college's limited financial resources. These students were not only hired to do traditional tasks such as maintenance and cleaning but also would be expected to construct new buildings and provide significant support to the college's computer center. This sense of dedication was both the college's biggest resource and the source of some of its biggest problems.

The computer center was understaffed, with only a few full time personnel. The rest of the work was done by student volunteers who were often quite talented and experienced. However they were still focused on their college studies. The chief business officer was a harsh, dominating personality who hired subservient personalities afraid of making mistakes. The controller was above average intellectually but he did not follow through at all on assignments between training visits. He consistently showed understanding of assigned tasks, promised to complete them, and then accomplished nothing, saying he had a lack of understanding about what needed to be done. As is typical with such personalities, he always blamed someone or something else for the situation. While this was happening, computer center personnel maintained their interest in their limited existing application with an old, complex, multilevel interface. They independently adopted the position that the old applications had to remain and interfaces had to be constructed because it would be impossible to determine how all the old applications worked. To test this assumption, in one visit the project consultant reviewed some 100,000 lines of the college's application software code with computer center personnel. It was quickly apparent that the functionality covered by the old code could be handled directly within the new BFS application, obviating the need for any interfaces. Computer center personnel reluctantly agreed. However by the next training visit the computer center personnel had reinstated their requirement to interface with the old code.

Eventually the client's allocation of training days for the new application was used up with no progress made on the implementation. The chief business officer would not accept any institutional responsibility for the situation. Despite his personality, he was never able to get cooperation from the computer center personnel. The implementation process finally broke down and college personnel abandoned the new budget and financial application in hopes of finding a simple PC based application that could substitute for the 100,000 lines of software functionality. However at the time this initially happened, personal computer and server technology had not advanced to the point where it could support an institution of that size and complexity. College personnel were seeking a technical solution for internal management failings.

Those who hold project managers responsible for the success or failure of a project will find fault with the project management in this situation. A hard line was never taken with senior management until the situation was out of control. Still at most organizations, even reluctant personnel eventually find ways to get all implementation tasks accomplished. For a variety of reasons senior management allowed institutional personnel to get out of control and were unable to deal with that reality.

New England State University System (NESUS)

The project was initiated by the university system's central office. The client had standardized on non-IBM computers as well as non-IBM telecommunication mechanisms. The project suffered from the fact that it was the first release of the software company's BFS budget and financial application for that hardware. In fact the initial release was a prettied up version of a product designed for an entirely different market place. Only after the initial implementation did the client receive a product that was based on a full conversion of the BFS application. Unfortunately neither design fully incorporated the latest hardware designs. The computer technology available was unable to handle the transaction-processing load because of the way transaction processing had been converted. In the initial implementation it was typical to have response times of between two to five minutes or more on single submits for transaction update. The long submit times led to the loss of a multi-site sale to a large foundation, leaving the non-IBM version of the BFS application without a market base. Many of the problems were only resolved with another major application software upgrade.

While there were difficulties in the way personnel handled the implementation and use of the new product, it was clear that many of the problems in the first years of the project related to the problems with the underlying software and the way it was implemented on that particular computer technology.

Major Midwestern State Related University (MSRU)

This is another implementation where there was an interesting contrast with a similar, nearby institution. This time, two large, complex state institutions within a relatively short distance of each other bought the same software at the same time. Both had strong purchasing directors who wanted the new software to meet the specific needs of their offices. Both implementations required extensive training. The implementation at this institution took well over five years. The implementation at the other university took nine months.

At the institution that took over five years, the vice president over the business office had not participated in the decision to purchase the new budget and financial application. Instead he was more interested in high-level budget modeling. Rather than utilizing the new BFS budget and financial application as a basis for budget development, he hired several new personnel to develop a PC based budget modeling application, a project to which he directed most of his attention. The assistant vice president over the business office was not a strong personality and had little to do with the project. The controller was a former audit manager for a major accounting firm. Like many former auditors, he focused on not making any bureaucratic mistakes. His former accounting firm was hired to provide additional consulting and implementation support. Without oversight, the

purchasing director expanded his list of mandatory changes to the new application before he would consider cooperating with the project.

Early on a team of business office personnel was charged with design of the new institutional chart of accounts. In most financial application implementations this is a key task around which institutional personnel can coalesce, providing project direction. This task also leads to a critical understanding of the institutional structures. Accomplishment of the task provides direction for the rest of the implementation. At this institution the task was never accomplished. When questioned, the controller said the task was unimportant and instead distributed a 150-page task plan that he had drawn up on expensive project management software. Ominously, the initial project overview took place on the same day as the Challenger space shuttle disaster. The space shuttle flew again before the university implemented the new application. As a result of the funds spent on outside consultants, the accounting firm manager over the project made partner and a software company employee was promoted to Vice President. A few months before the date scheduled to go live with the new application, the client realized that the chart of accounts had not been designed and that all of the training had been on a dummy model with a chart of accounts very different from that which they eventually needed to use.

The project had become a feeding frenzy for the consultants. University personnel were unable to manage outside vendors and their internal lack of cohesion led to an implementation that was extended well beyond the norm. Neither did the university personnel understand how consultants encouraged client dependency. Interestingly all along key institutional personnel believed that they were carrying out the implementation the "right" way. When questioned about the amount of consulting time and the money it took, they explained that their institution was very unique and the special circumstances required a special implementation effort. Meanwhile an almost identical institution less than thirty miles away in the same state carried out its implementation using the standard product in nine months.

These six cases represent real world examples of implementation failure. They are presented through the eyes of a person who was close to the projects yet who is making efforts to be objective. The question here is how do the reasons for application implementation failure compare to those projected in the literature? A summary of the issues and problems identified in these implementations is shown in Table 3.

Table 3: Summary Reasons for Project Failure						
Projected Reasons	WSUS	NELA	MSUS	SWRC	NESU	MMSR
MIS designs that do not take into account the behavior of personnel in organizations.						
Inflexible MIS designs.		*				
Incorrect assumptions by designers about personnel in organizations.						
Managerial expectations not met by MIS		*		*		
MIS technology advances beyond the project.						
Lack of senior management support: poor management leadership.	*	*	*	*		*
Project managers lack authority commensurate with responsibility.	*	*		*		*
End user expectations not being met.	*	*			*	
Lack of familiarity with new MIS technology.	*		*	*	*	
Disagreements within the project group.				*		
Escalation in time to completion or in cost of project.			*			*
Other / summary.	Concern for costs drove poor Technological decisions.	Poor leader-ship	Lack of experience and com-petence	Poor leader-ship	Poorly used tech-nology	Convinced of own uniqueness; big bucks to consultants

CONCLUSIONS

It is possible to make a case that additional boxes should be checked, depending on one's perspective. The attempt here is to focus on key patterns. Review of the Table 3 reveals several such patterns.

- As noted by Schmitt and Kozar (1978) multiple reasons are often behind any particular project failure. Rarely does a single reason by itself bring about failure. This indicates that a project effort can be weak in some area and yet be successful.
- Failures in senior management leadership are associated with most application implementation failures.
- The project manager is consistently in a difficult position because of an inherent lack of authority. This appears to be part of the nature of project management itself. Contrary to what is held by Glennon (1978), this reality will not change. Because projects like this cross so many institutional boundaries, project managers will probably always be expected to win people over to a project task rather than be able to order project personnel to do something. This places even more responsibility on senior management to provide appropriate leadership around project activities
- Problems with new technology and a lack of experience in design and implementation of new technology play a much larger role in the project failures reviewed than would be expected from the literature.
- Incorrect design assumptions on the part of analysts and MIS inflexibility play less of a role in the project failures reviewed than projected by the literature.

What then are the generalized implications of this analysis? First, effective senior management leadership is important to the success of any project. Second, the project manager position in an organization is difficult and has unique requirements. If an organization does not have personnel familiar with the role, managers should consider training for those who will hold such positions. Third, many such projects require learning new ways of working together and accomplishing tasks. While this may not qualify as new technology in the same sense as is found in highly technical activities, senior managers should be careful to ensure that new project activities do not significantly exceed the level of experience of organizational personnel. Training in new ways of working together may be necessary before initiating major new application software projects. Further, senior managers need to provide support to project managers and should review project implementation activities on a regular basis.

This study identifies six real world failures within the same organization and application software type. The literature identifies failures in other organization and software types. The most frequently identified reasons for failure are common across both data sets suggesting that

organization type and application type may not be important elements in implementation failure. This suggests several areas for further investigation. In the past, users were often unfamiliar with computer technology and the user interface for any application had to be designed uniquely for that application. Now users are familiar with computer technology and user interfaces are common across many applications. Determining whether these factors may be related to a change in the number of and reasons for implementation failure may help better define the reasons for failure. Finally, no study has been identified that attempts to relate implementation failures to cultural differences in the business place. Investigation here may also contribute to understanding reasons for failure.

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PEER MENTORING IN INTRODUCTORY ECONOMICS: THE COSTS AND BENEFITS OF SUPPLEMENTAL INSTRUCTION

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ABSTRACT

Supplemental Instruction is an embedded peer tutoring program developed at the University of Missouri, Kansas City. It is targeted at classes where attrition rates tend to be highest and students may have difficulty successfully completing the course. This paper is a case study of two large classes in introductory macroeconomics where the Supplemental Instruction program was implemented. Data collected show a statistically significant decrease in the percentage of students with unsuccessful course outcomes (grades less than 'C' or dropping the class) and a statistically significant increase in the class GPA from prior semesters without Supplemental Instruction (SI).

INTRODUCTION

Supplemental Instruction (SI) is a system of providing peer-led review sessions for students enrolled in high-risk courses. Review sessions are led by a student called an SI leader who is identified by the faculty for the course as having successfully mastered the course material. The work of all SI leaders is overseen by a SI supervisor. SI was developed in 1973 at the University of Missouri Kansas City (UMKC) by Dr. Deanna Martin. By targeting historically difficult courses, SI removes the stigma that students may feel is attached to other types of interventions such as tutoring. Originally designed for medical students in organic chemistry, the program has grown to cover many different disciplines including economics. SI translates well into many programs and cultures. It has been used internationally with great success.

This paper explores the use of SI in an introductory Macroeconomics class in a four-year institution in central Pennsylvania, USA. There is a brief review of the literature on SI followed by a short description of how SI is structured. Next is a statistical analysis of student outcomes after the introduction of SI. Finally, as an economist, I cannot resist an overview of the costs and benefits of using SI at our campus.

LITERATURE REVIEW

There is a wealth of research on the effectiveness of SI. Much of this research is abstracted at the UMKC Supplemental Instruction website: http://www.umkc.edu/cad/SI/Index.htm. Researchers have attributed the following benefits to student participation in an SI program: students gain a better understanding of the learning process (McGuire, 2006), learning strategies are transferred to non-SI courses (Collins, 1982; McGuire, 2006), students' grades improve (Arendale & Martin, 1997; Martin, Blanc, & DeBuhr, 1982; UMKC, 2005), student retention is improved (Arendale & Martin, 1997; Zerger, Clark-Unite, & Smith, 2006), and finally students gain experience in collaboration (Hurley, Jacobs, & Gilbert, 2006).

SI is not a program confined to the United States and its positive impact is seen all over the world. Students who participated in SI programs in 25 courses offered at the University of Port Elizabeth in South Africa earned higher grades than non-participants in most courses for which SI was offered. The researchers found that in courses in which this effect was not seen, students were heavily scheduled and could not regularly attend SI sessions (Clark & Koch, 1997). Researchers at the University of New England, Australia, (Worthington, Hansen, Nightingale, & Vine, 1995) reported that insufficient time was the most common reason students in their survey gave for not attending. Research on the implications of students' self-selection in SI (Loviscek & Cloutier, 1997) found that programs such as SI do have a "demonstrable payoff in the form of increased student learning."

With respect to economic courses specifically, Carson and Plaskitt (1994) found that students in economics and sociology courses described four reasons for the effectiveness of SI: "improvement of learning ability, increased interest in the subject, a forum to meet new friends, and SI leader support." Zaristky (1994) found that Economics 1 students at La Guardia Community College who participated in SI had higher percents of A, B, and C grades (51.7%) and lower percents of D, F, and W grades (48.3%) than those who did not participate (43.6% A, B, and C and 56.4% D, F, and W). Worthington, Hansen, Nightingale, & Vine (1995) found that the failure rate in an introductory economics course offered at the University of New England, Australia, dropped from 33% to 18% after SI was initiated. Hill (1992) also found that students in an introductory economics course earned higher grades if they attended SI sessions.

Stout & McDaniel (2006) report that SI leaders benefit from SI as much, if not more than, the students who attend the sessions. Benefits include "increased understanding of the course material, improved communication skills, and enhanced interactions with faculty, students, other SI leaders, and SI staff." Students who served as SI leaders in 25 courses offered at the University of Port Elizabeth, South Africa, reported the following benefits to themselves: "reinforced knowledge of the academic discipline, improved personal academic performance, increased facilitation and interpersonal skills, increased personal self esteem and confidence, and increased career opportunities due to skills in group facilitation." SI leaders at the University of Sydney,

Australia, reported similar benefits after serving as leaders in an SI program for economics students. In addition, they reported "a change in the way they thought about economics." (Yates, Gill, & Webb, 1995)

THE STRUCTURE OF SUPPLEMENTAL INSTRUCTION

At Penn State Altoona, we define high-risk courses as those with a D (unsatisfactory), F(failure), or W (withdrew from course) rate of 25-30% or higher. The Learning Resources Center (LRC) Coordinator is the SI Supervisor. At Penn State Altoona, the student SI leader must meet the following minimum requirements for tutoring in our LRC: at least nine credits completed at Penn State Altoona, an A or A- in the courses the student would like to tutor, the approval of the professors who taught the student those courses and of the LRC coordinator, and a GPA of at least a 3.0. (The average GPA of peer tutors is usually much higher; during the past several years, it has been averaging 3.80.)

SI leaders must complete the peer tutor training course and additional training on conducting group sessions. The training specific to SI must be provided by a certified Supplemental Instruction supervisor. Ms. Ford earned this certification from the University of Missouri Kansas City in June 2000. Faculty members do not have to train or supervise the SI leaders. Once faculty identify appropriate students, training and supervision is provided by the LRC Coordinator. Of course, faculty members who might have concerns are welcome to discuss them and address any solutions. So far, problems have been minimal in our SI program.

SUPPLEMENTAL INSTRUCTION AND INTRODUCTORY ECONOMICS

The dilemma for our economics students at Penn State Atloona has several facets. Economics at the college is traditionally a large class of around 100 students with the varying degree of preparedness and abilities inherent in any introductory level class. As any faculty who teach introductory level classes knows, it is a challenge to keep the strong students engaged while not leaving the weaker students behind. The amount of quantitative reasoning involved in economics classes adds another obstacle for students who may still be in the process of mastering algebra and graphing skills that are used extensively in the class. Since we are a four-year college, we have no teaching assistants or graduate students to hold recitation sessions or to help with grading, which creates an incentive for faculty to reduce the amount student work that requires direct feedback from the instructor. This, of course, flies in the face of our knowledge of how learning takes place.

The introductory macroeconomics classes clearly seemed to meet the criteria for SI. I implemented the program fall semester 2002 in two sections of introductory macroeconomics courses (ECON 004). Each section had 100 students enrolled. I changed nothing else from the previous semester-same assignments and worksheets, exams, essays, and lecture material. After

receiving approval from our Institutional Research Board (IRB) to conduct research that involved human subjects, I distributed a survey to the students at the end of the semester. In order to use the survey for the study, the students were required to sign a release form. Participation in the study was strictly voluntary with no rewards added for completing the survey and signing the release. We ended up with 143 useable surveys, which was a response rate of 73.8 percent. Additional data on students was requested from our registrar. The outcomes of the students from the spring 2002 semester were compared with the students from the fall semester. STATA 7 is the statistical program used to analyze the data. Overall, our findings are quite consistent with studies mentioned earlier.

Table 1 presents descriptive statistics for mean course grades and the percentage of unsuccessful outcomes comparing fall 2001 and spring 2002 Macroeconomics classes that did not use SI with fall 2002 when SI was introduced. There was a statistically significant increase in the overall mean class grade and a statistically significant decrease in the percentage of unsuccessful course completion. The mean course grade for fall 2001 was 2.31 and for spring 2002 was 2.22 on a scale of 0 (F) to 4.0 (A). The mean course grade for fall 2002 was 2.66. In fall 2001 25.4 percent of students and in spring 2002 26.7 either dropped the class or earned less than a C. In fall 2002, only 19.5 percent of students did not successfully complete the course, a decrease of 7.2 percentage points.

Table 1: Descriptive Results of Course Outcomes

	Fall 2002 (n=195)	*Fall 2001 (No SI)* (n=193)	*Spring 2002 (No SI)* (n=176)
Percent A&B	49.2% (96)	40.3%* (63)	42.9%* (67)
Percent Unsuccessful	19.5% (38)	25.4%* (49)	26.7%* (47)
Final Course Grade (mean)	2.61 (186)	2.33** (180)	2.31** (156)

Level of significance for differences using t-test: **P=<.01,*P<.05

The issue of self selection of students into SI is raised in a study by Congos and Schoeps (1998). If students who attend SI have better course outcomes, specifically higher grades, then the suggestion is that SI students have more academic potential so that higher grades were not necessarily due to the influence of SI. Table 2 shows the verbal and math SATs for all students in the two Macroeconomics classes and scores by whether or not the student attended SI. Both the verbal and math SATs are much lower for the students using SI than students who did not. In fact, SATs for the students attending SI is lower than the class average of the SATs. Yet, the grade for the class is slightly higher for the SI students. The cumulative GPA (not including Fall 2002) for

students attending SI is slightly lower than the cumulative GPA of students who did not use SI. This would seem to be evidence that SI does indeed contribute to the successful outcome of macroeconomics for some of our students who are less prepared academically.

Table 2: Students Who Responded To Survey
n=143 (73.8% response rate for usable surveys)

	Total	Non-SI	SI
Distribution of SI and Non-SI students	-	68.7% (99)	30.6% (44)
Final Course Grade (mean)	2.69	2.67	2.71
Unsuccessful (D or F)	13.9% (20)	15.2% (15)	11.4% (5)
D F		D=11 F=4	D=5 F=0
Cumulative GPA (mean)	2.95	2.96	2.92
SATs (mean)			
Verbal	527	555.7	465
Math	547	583	528
Gender			
Males	58.7% (84)	57.5% (57)	59.1% (26)
Females	41.7% (60)	42.4% (42)	40.9% (18)

A simple linear regression is used to test the impact of attendance in SI sessions on the grade received for the course. Control variables include the student's verbal and math SAT scores, cumulative GPA (not including fall 2002) and a measure of attendance and participation in class activities and worksheets. Cumulative GPA, in-class participation, math SATs and attendance in SI are positively associated with a higher grade in the course. Cumulative GPA and in-class participation are statistically significant. While attendance at SI sessions is not statistically significant, there is a strong positive relationship of the number of times attended and the course grade. (See Table 3.)

Table 3: OLS Regression Results	
Variable	Coefficient (SE)
# of times attended SI	0.0181 (.016)
attendance and participation	0.0095* (.004)
verbal SAT	-0.0001 (.001)
math SAT	0.0004 (.001)
cumulative GPA	1.0088* (.102)
Adjusted R^2	0.5922
n=143	
*P<.05	

Student responses to selected questions are listed in Tables 4 and 5. Included in the tables next to the responses is the mean class grade for that group of students. The first question asks whether the SI sessions were helpful in understanding class material. A Likert scale from one to five where one indicates SI was not helpful to understanding class material, to five where five indicates SI was very helpful. Twenty-nine or 65.9 percent of students indicated a 4-5 on the scale indicating that the sessions were very helpful in understanding class material. The other question asks survey participants whether SI session helped in preparing for exams. Again, a Likert scale from one to five where one indicates SI was not helpful in preparing for exams, to five where five indicates SI was very helpful in exam preparation. Here the results are more mixed. While 54.6 percent of students rated SI sessions from 4 to 5 in helpfulness in preparing for exams. Keeping in mind the small sample size, the one student who claimed SI did not help at all in preparing for the exams earned an A- in the class. This may be a student who was already well prepared. We also asked students who did not attend SI their reasons for not attending (see Table 6). Almost half the students replied that the scheduled meetings did not fit their schedule. 32.1 percent of students not attending SI said they did not feel it was necessary. Two students replied they had been to study sessions and did not find them helpful.

Table 4: Helped to Understand Material		
Help in understanding class material Scale	Percent n=44	Mean Grade
1 (not helpful for understanding class material)	0.0% (0)	
2	11.4% (5)	2.47
3	22.7% (10)	2.5
4	40.9% (18)	2.89
5 (very helpful)	25.0% (11)	2.70

Table 5: Helped Prepare for Exams		
Help in preparing for exams Scale	Percent n=44	Mean Grade
1 (not helpful for exams)	2.3% (1)	3.33
2	9.1% (4)	1.92
3	34.1% (15)	2.62
4	45.5% (20)	2.78
5 (very helpful)	9.1% (4)	3.5

I am going to round out the discussion of our findings by comparing the costs and the benefits of SI for faculty, the SI leaders, the students and the institution. For faculty teaching the courses that use SI, the dollar cost is zero. The only cost to instructors is identifying students who qualify as facilitators for SI and taking a few minutes from class to promote participation in the program. The benefits include helping students refine their thinking and study skills that lead to mastery of course content and better academic performance. In addition to that warm, fuzzy glow from seeing students succeed, there may be an improvement in measures of teaching effectiveness. Towards the end of each semester on our campus (and probably at many others) each instructor is asked to administer a Student Evaluation of Teaching Effectiveness (SRTE) to each class. Students

respond to a set of questions evaluating the course and the instructor. Currently on our campus, SRTEs are the primary measure of our teaching for promotion, tenure, and pay increases. Answers to questions are based on a Likert scale of one to seven where seven is the highest rating possible. Table 7 shows the changes in the key SRTE questions before and after implementing Supplemental Instruction in my Macroeconomics classes. There was a 3.6 percent increase in the rating of the overall course from spring 2002 to fall 2002 and a 1.3 percent increase in the overall rating of the instructor. Comparing the means of course and instructor effectiveness from fall 1999 through spring 2002 to the fall 2002 semester when SI was implement, there is a 9.2 percent increase in the mean over all years in the rating of the overall course and a 7.9% increase in the overall rating of the instructor.

Table 6: Reasons for Not Attending SI

Reason for not attending SI	Percent n=65	Mean Grade
Schedule conflict	47.7% (31)	2.60
Didn't feel it was necessary	32.3% (21)	2.82
Been to similar study sessions and didn't find them helpful	3.1% (2)	2.00
Intended to, but couldn't find time	12.3% (8)	2.88
Other	3	2.67

Table 7: Impact on SRTEs

Mean SRTE	Overall Course	Overall Instructor
Percentage change from mean of all years	9.2%	7.9%
Percentage change from 2001-2002	3.6%	1.3%

For student facilitators, the costs are mainly the opportunity cost of spending time preparing and conducting SI sessions and sitting in the class instead of doing other activities. A direct benefit for students is pay for the time spent preparing and conducting SI session. The SI leaders are paid $10 per hour (2006-07 rates) by the LRC budget. The SI leaders are paid for the review sessions, for attending classes, and for preparation. Peer tutors who work one-on-one with students are paid

$7.00 per hour during their first semester of tutoring and $7.25 per hour in successive semesters. Even though SI leaders earn more per hour and are paid to attend class and prepare materials for their review sessions, the SI program saves the LRC funds because average attendance at SI sessions is four students. In addition to the cost savings, and much more important, is the fact that SI sessions are an effective, efficient way for students to learn.

Student facilitators are participating in a recognized program (International Center for Supplemental Instruction--UMKC as part of Center for Academic Development). This looks great on students' resumes while also building their knowledge base and communication skills. Other studies listed earlier in the paper also note the benefits to the student leaders.

The primary benefit for institutions using SI is clear: student retention. If colleges and universities can provide tools proven to increase student success, students (and their tuition dollars) are more likely to stay enrolled and graduate.

CONCLUSION

This paper is a case study assessing the effectiveness of introducing Supplemental Instruction, a peer mentoring program, into an introductory Macroeconomics classroom. The key findings are an overall drop in the number of students dropping the course or receiving a D or F. We also argue and provide some evidence that the benefits of SI far outweigh its costs for students, faculty and the institution. Truly, the saying below captures well the essence of SI:

Tell me, and I forget
Show me, and I remember
Involve me, and I understand.

Chinese Proverb

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THE INFLUENCE OF ENVIRONMENTAL TURBULENCE ON THE STRATEGY-PERFORMANCE RELATIONSHIP AMONG NEW VENTURE START-UPS: THE HIGH-TECH AND BIOTECH INDUSTRY

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ABSTRACT

This study examines the influence of environmental turbulence on the strategy-performance relationship among first movers and second movers in the high tech and biotech industry in the United States. The data for this study were collected primarily through an online survey as well as mailed out surveys to top executives of high tech and biotech new venture companies in the United States.

This study found significant differences between first movers and second movers in the high tech and biotech industry in regards to the type of strategy process employed and level of environmental turbulence. Specifically, first movers employed a mixed strategic process, whereas, second movers employed a formal strategic process. In addition, first movers reported they operated in moderate environments, whereas, second movers reported operating in environments that were stable.

INTRODUCTION

In high tech and biotech industries, firms are immersed in a fast-moving, tumultuous, unpredictable, and complex environment. Accordingly, high tech and biotech firms must be fully alert to the changing circumstances occurring in its environment. The ability to sense and then seize opportunities afforded by these changes is critical to a firm's survival and future prosperity. Such action requires that the firm possess the ability to understand the fundamental drivers of change so that it can quickly chart action plans to support its sustainability. To survive and achieve success, new ventures need to understand the dynamics of competition in their industries (McGonagle and Vella, 2004) and develop the skills and capabilities that give them a competitive advantage. Possessing effective strategic capabilities can be useful in guiding managers' thinking about the types of assets and resources to develop, the capabilities to be deployed, and the strategic objectives to be emphasized (Fahey, 1999).

While the theoretical constructs have been clearly outlined in organizational literature (Jauch, Osborn, and Glueck, 1980; Tosi, Hunter, Chesser, and Carroll, 1976; and Lawrence and Lorsch, 1967), there is still some difficulty in demonstrating how the environment impacts upon the decision making process of the managers. In a study by Fahey and Christensen (1986) emphasis was placed on posturing the firm with respect to its environment. Because the environment of high tech and biotech new venture firms possess much uncertainty, it is essential that top managers scan and interpret environmental changes to maintain their firm's viability and performance (Elenkov, 1997). This process can assist managers in maintaining an effective match with their environment and improve their firm's performance (Stone and Brush, 1996). The skill of the manager in understanding and reacting to these differing environmental conditions should be emphasized (Thompson and Keon, 1981). Moreover, the attentional patterns of top managers must be given greater consideration. The importance of managers' understanding and ability to effectively manage his or her surroundings has always been a critical concern (Thompson and Keon, 1981). Past studies on firm strategy show that researchers typically examined external conditions with less attention to conditions internal to the firm. While the importance of the firm's external environment has been established, it is inferred that a study of the aspects of the external environment may be important. In addition, it is important to note that the firm's internal environment should not be down played. Thus, the specific element of the environment is an important variable that must be considered and understood by managers.

The problems and concerns raised in this section explored the importance of this study to managers of high tech and biotech new ventures. As the competitive landscape expands and intensifies due to advancements in technology, the growing interest in entrepreneurial ventures is expected to escalate. Firms vying for survival and success in these industries seek solutions and practical applications to achieve optimal performance.

THEORY DEVELOPMENT AND HYPOTHESES

The importance of strategy to managers of old and present is found in the business literature and all agree that managers are confronted with rapidly changing and fast-paced competitive environments making strategic thinking a requisite. Today, more so than years past, managers are plagued with one of the worst economic environments experienced in decades. Such economic conditions place intense demands on organizations to manage the discontinuities by actively engaging in key strategic decision-making. An organization's environment has been found to be a key variable in the relationships between strategy and performance (Porter, 1980). Much of the strategic management literature has focused on the relationship of strategy and performance and considered environments to play a critical role in that relationship. Research examining the threefold relationship of strategy-performance-environments, however, have not adequately addressed the issue of whether environments are independently related to performance, are moderators of the

relationship between strategy and performance, or some combination of the two (Prescott, 1986). In this regard, the environment has been described by past researchers as posing an element of uncertainty to organizations (Lawrence and Lorsch, 1967; Duncan, 1972). Further exploration of the moderating role of environmental turbulence (Ansoff and McDonnell, 1990; Miller, 1987) in the organization's strategy and performance relationship is essential.

The field of strategic management has conceptualized environment as one of the key constructs for understanding organizational behavior and performance (Hofer and Schendel, 1978). This is supported by research findings, which suggest that characteristics of an organization's environment influence decision making through managers' perceptions. While the research of Miles and Snow (1978) illustrate that managers enact their decisions by focusing on certain conditions, trends, and events in their environments, they do not address specific elements of the environment that managers should pay attention to. Beyond the objectives of SWOT analysis, the specific element of the environment that managers pay attention to requires further investigation. Measures of output, input, and internal attention are summative measures of elements of the environment that were developed based on stakeholder approach to organizations (Freeman, 1984) and open systems theory (Katz and Kahn, 1966). In addition, the dimensions of the external environment require further examination to determine its relationship to outcomes of performance.

It is hoped that the exploration of the interrelations of the variables in this study will offer meaningful outcomes that illustrate the effect different firm strategies and strategy processes have on the promotion of successful firm performance.

Two concerns of mainstream strategy research are to explain what determines firm performance and to identify what affects firm strategy. The purpose of this study is to integrate prior theory and research to guide the conceptual development of key hypotheses and to investigate these relationships. Based on earlier findings, this study suggests a unique configuration of firm strategy, strategy process, and environmental turbulence to achieve optimal firm performance. The distinctions between firm strategy and strategy process has been regarded as an area of important study in the strategic management literature. This has led to a need for further theory building and hypotheses testing of these two important aspects of strategic management. Hence, the distinction between firm strategy and strategy process will be addressed. The moderating effects of environmental turbulence on the relationships of firm strategy, strategic process, and performance will be explored to determine its overall effect on the firm.

The literature that relates the dimensions of the variables in this study will be presented and discussed. Then drawing on the discussions and findings in the literature, configurations of the variables will be hypothesized. The hypotheses will be developed to reflect the effect of each of these variable dimensions on the performance of high tech and biotech new ventures. An outline of the conceptual steps follow and key objectives are provided.

Strategy Content – The Firm's Strategy

The importance of strategic decisions made by organizations has been an area of interest for both practitioners and academicians from the perspective of strategic management as well as other fields. This has led to an emergence into the growing body of research on strategy content. Strategy content research is defined as "research which examines the content of the decisions regarding the goals, scope, and/or competitive strategies of corporations or of one or more of their business units" (Fahey and Christensen, 1986). Streams of research on strategy content focused on diversification tendencies of large corporations (Wrigley, 1970; Rumelt, 1974), growth-share matrix by the Boston Consulting Group (1973), and the profit impact of market strategy also known as PIMS (Schoeffler, Buzzell, and Heany, 1974). In light of the studies during this timeframe, Hofer (1975) stated that much emphasis was placed on organizational processes by which strategies were developed rather than on the content of strategies themselves. Thereafter, the area of strategy content experienced a dramatic development. Of interest to this research is the stream of studies pertaining to strategic taxonomies. In the mid-1980s, strategic management researchers began advancing research focus on strategic taxonomies that is often referred to as gestalts, strategic archetypes, or generic strategies (Fahey and Christensen, 1986). These efforts sought to provide a mechanism through which different strategies or patterns of strategic behavior could be classified as well as investigate the differential performance implications of generic strategies within different environmental conditions. Prior studies documented a variety of different strategic behaviors such as those labeled by Robinson and Pearce (1985) as efficiency, service, product innovation, and brand identification. Utilizing the PIMS database, Galbraith and Schendel (1983) suggested six different strategy types as harvest, builder, continuity, climber, niche, and cashout. Another study by Hawes and Crittenden (1984) identified three strategic behavior patterns classified as aggressive initiators, conservative reactors, and submissive defenders. The generic type strategies established by Porter (1980) were supported by the work of Dess and Davis (1984) who found clusters of firms pursuing close resemblance to the low-cost producer, differentiation, and focus generic groups. Then, there is the work by Hambrick (1983) who found partial support of the Miles-Snow (1978) strategy types.

A review of the strategic management literature reveals the Miles-Snow (1978) typology to be one of the most popular classifications of firm-level strategies and has generated a great deal of interest and debate among researchers in the field. The typology is based on the premise that four identifiable strategic orientations exist within an industry that has been classified as Defenders, Prospectors, Analyzers, and Reactors. The features of each type have been discussed in sufficient detail in past studies (Miles and Snow, 1978; Miles, Snow, Meyer, and Coleman, 1978; Miles, 1982). If properly implemented, the Defender, Prospector, and Analyzer strategies can lead to effective firm performance (Zahra and Pearce, 1990). Past research have strongly supported the finding that Defenders, Prospectors, and Analyzers will outperform Reactors. Studies also indicate

that there is mixed support to substantiate that Defenders, Prospectors, and Analyzers are equally effective strategies.

The taxonomy-oriented research stream reveals a type of research development that has transpired on the subject of business strategy content. Taxonomy-oriented research offers some theoretical potential that could allow for the identification of interrelated strategy components, acknowledging that competitive strategies "represent a network of interactions among the various constituent elements that ultimately make up a business strategy" (Galbraith and Schendel, 1983). The research efforts have resulted in seemingly discrete and unrelated attempts to "taxonomically" identify different strategy types. As a result, there is little convergence among the research findings offering opportunity for further research. It seems movement toward some congruence as well as empirical testing of the conceptual typologies or strategy types is the next step, an important implication researchers have alluded to in their writings (Hofer and Schendel, 1978).

To that end, an examination of the literature on strategy types has revealed a simple observation apropos to the high tech and biotech new venture industry. Taking into consideration prior studies' differing categorizations of strategy type, the consistency lies in the clear-cut grouping of leaders and followers. Based on that distinction and in consideration of the high tech and biotech new venture's organizational and environmental activities, the firm strategy types that will be used in this research is classified into two groups: first movers and second movers.

Companies adopting a first mover strategy are described as taking an initial competitive action. This concept was influenced by economist Joseph Schumpeter who believed that firms achieve competitive advantage through entrepreneurial discovery and innovative competitive action (Lado, Boyd, and Hanlon, 1997). In general, first movers "allocate funds for product innovation and development, aggressive advertising, and advanced research and development" (Cheng and Kesner, 1997). Cheng and Kesner go on to say that mover advantages lay in the ability to enter the market in a niche the firm has created, to establish the standards competitors will have to follow, and to achieve an uninterrupted or challenged period of time in which to build brand recognition. Scholars, Hitt, Ireland, and Hoskisson (1999), suggest there are several advantages to be gained by adopting a first mover strategy. The advantages resulting from successful first mover actions will allow a firm to earn above-average returns until other competitors are able to respond effectively. First movers also have the opportunity to gain customer loyalty, making it difficult for responding firms to capture customers. Some disadvantages associated with the first mover strategy include the high degree of risk that must be taken, high development costs, and a dynamic and uncertain market.

Hitt, Ireland, and Hoskisson (1999) describe second movers as firms that respond to a first mover's competitive action through imitation or incremental improvements in the first mover's technology without incurring the steep research and development costs that the first mover incurred. Second movers could also respond with a move designed to counter the effects of the first mover's action. Fast second movers who respond quickly to the first mover's action may be able to earn some of the first mover's advantages without experiencing the potential disadvantages. Second movers

often evaluate customers' reactions to the first mover's actions before responding (Ginsberg and Venkatraman, 1992). There are some disadvantages that second movers encounter. Scholars reveal that the second mover is forced to adopt the standards set by the first mover. Environments that are turbulent produce shorter product development cycles, so technological know-how is an important factor in firm survival and firms in this type of environment are more likely to engage in processes that keep costs down (Zahra, 2000).

The findings of prior studies reveal a tendency for researchers to emphasize the posturing of the firm with respect to the environment. Findings show that attention is paid most typically to the external environment and considerably not as much to the internal environment. This is supported by the literature, which acknowledges the effect of the external environment on a company's strategic decision making process (Boyd, Dess, and Rasheed, 1993). The key dimensions of the environment dictate the position first movers and second movers can occupy in the competitive landscape as well as the sustainability of that position. First mover advantage lies in the ability to enter the market in a niche the firm has created to establish the standards competitors will have to follow and achieve an uninterrupted or challenged period of time in which to build brand recognition (Stearns and Allen, 2001). By contrast, stable environments produce more follower strategies, this typically occurs after a dominant technology has emerged (Miller and Friesen, 1984). In this study, the relationship between the firm's strategic planning process and organizational performance will depend upon the content of strategy the firm pursues (Rogers, Miller, and Judge, 1999).

The Firm's Strategic Process

Research in regards to a firm's strategy process has gained some attention since the famous debates of H. Igor Ansoff (1991) and Henry Mintzberg (1990, 1991). These articles aptly articulated two different approaches to strategic management and facilitated the movement of the field towards a "synthesis or perhaps reconciliation" between them (Goold, 1992). Thereafter, articles in the literature review showed evidence of submissions of different, mostly conceptual, perspectives to attempt to synthesize these two differing views of strategy process. The strategy making process has been portrayed as either rational or incremental (Lindblom, 1959; Fredrickson, 1984), in some cases, formulation and implementation (Andrews, 1971; Porter, 1980). While these studies have given yield to empirical testing, little cumulative knowledge has been reached in regards to the range of processes and the use of different performance measures (Miller and Friesen, 1977; Shrivastava and Grant, 1985; Guth and MacMillan, 1986; Wooldridge and Floyd, 1990). Even studies that focused on the same constructs revealed little convergence (Miller and Friesen, 1983; Fredrickson and Mitchell, 1984). In Hart and Banbury (1994), an incomplete compilation of an array of selected strategy making process models exemplifies the little convergence found in the literature.

Furthermore, it is evident that little effort was made to integrate existing models or to examine the extent to which multiple strategic processes are required (Huff and Reger, 1987).

Given these findings, it is determined that the strongest and most comprehensive bearings of strategy remain with the two basic contentions explicated by Ansoff (1991) and Mintzberg (1990, 1991). On the one hand, the strategy process is based on principles of rational decision-making and assumes that purpose and integration are essential for a firm's long-term success (Andrews, 1971; Ansoff, 1965; Hofer and Schendel, 1978; Lorange and Vancil, 1977; Steiner, 1969; Thompson and Strickland, 1981; Uyterhoeven, Ackerman, and Rosenblum, 1977). On the other hand, the strategy process is viewed as a set of incremental models that are presented as alternatives, or simply as more accurate characterizations of how organizations actually make strategic decisions (Braybrooke and Lindblom, 1970; Lindblom, 1959, 1979; Mintzberg, 1973; Quinn, 1980).

The works of which the literature cites Ansoff as its proponent has been referred to in the research literature as planning, synoptic, formal, or rational. Conversely, Mintzberg's perspectives are often referred to as incremental, adaptive, or emergent. For the purpose of this paper, the terms formal and emergent will be used to identify the two strategy processes that will be examined. A study by Fredrickson (1983) makes the following distinction between the formal and emergent strategy process. The formal strategy process uses a systematic method to solve an entire problem. Planning is a deliberate, rational, and linear process, where the ends are specified first, followed by the means. In the formal strategy process, plans emerge from the strategy formation process "fully specified, ripe for implementation through detailed attention to objectives, programs, and operational plans of ever increasing specificity." The emergent strategy process breaks down problems into subproblems that are solved sequentially. It is described as an adaptive, incremental, complex learning process where the ends and means are either specified simultaneously, or are intertwined. Fredrickson (1983) goes on to state that the ends are rarely announced or recorded in a formal planning document, and when they are announced, they remain broad, general, and non-quantifiable. The means develop and evolve over time as organizations learn from environmental interactions. One study presented summaries from the works of Lindblom (1959) and Mintzberg (1973) detailing a comparison of formal and emergent processes and found that they differed on a number of major characteristics which included motivation, goal concept, means and ends, concept of choice, analytic and integrative comprehensiveness (Fredrickson, 1983). This comparison of processes reveals strategic decision making as a multidimensional process. While the observation remains questionable due to lack of empirical testing, the comparison table does offer a good starting point to compare the two processes. In addition, it serves as a source of reference for debate and discussion of the two processes, which leads to the question, "Which strategy process results in superior performance?"

While debate ensues over which strategy process to employ, scholars have argued the possibility that there exists a mixing of the two strategy processes in businesses (Mintzberg, 1973; Lorange and Vancil, 1977; Nutt, 1976). It has been observed that "some stages of strategic decision

making require a formal process while others call for an emergent one" (Nutt, 1977). The choice to use either process is contingent on the nature of the decision and the functional orientation of the department involved (Mintzberg, 1973). Many studies suggest that a variety of contextual factors such as firm size, environment, or structure may explain why either a formal or emergent approach may be used (Mintzberg, 1973; Lorange and Vancil, 1977; Nutt, 1976). Scholars argue further that organizations not only employ both formal and emergent approaches, and that strategic processes may be formal on some characteristics and simultaneously emergent on others, but in some cases, may assume conditions that are neither formal nor emergent (Fredrickson, 1983). While the latter point is an interesting one, the point is challenged by scholars who state that to be effective, strategies should have both formal and emergent qualities (Mintzberg, 1994; Hax and Majluf, 1988). Firms relying on any single mode may suffer from limitations and biases while firms that combine the different routines (Nelson and Winter, 1982) should experience few blind spots and enhanced performance (Hart and Banbury, 1994). Research on strategic decision models has favored modeling along a continuum where formal and emergent decision making strategies exist to varying degrees (Eisenhardt and Zbaracki, 1992). The study of the strategy process along the formal to emergent continuum has received some theoretical attention but those studies are largely unsubstantiated on an empirical basis (Slevin and Covin, 1997). Based on this gap, there is a need for exploration into the potential formal to emergent strategy range and the fundamental role it plays in depicting how strategies exist in organizations.

In this paper, the organization's firm strategy is identified as the factor that drives the type of process the organization employs. Many prescribed conditions offering a "best fit" context for the use of formal or emergent strategies have yet to be substantiated (Slevin and Covin, 1997). Because of this, the proper context for each strategy process approach has not been the subject of extensive empirical investigation. However, some researchers have examined related strategy process issues such as strategic decision making rationality which focuses on the extent to which decision makers follow a systematic process in reaching carefully thought out goals (Schwenk, 1995; Rajagopolan, Rasheed, and Datta, 1993) and bounded rationality where such issues as "cognitive limitations, incomplete information, behavioral processes intervene to preclude optimal *a priori* decisions" from being made (March and Simon, 1958; Allison, 1971).

In consideration of the above debates, there is an obvious need for advancement of research into the finer points of the strategy making process. Determining which model of strategy formulation or formation results in superior performance offers great research opportunity that serves to benefit many in the academic and business communities. A review of the literature establishes that examination of the relationship between an organization's strategy process and firm strategy deserves further study. Particularly, research examining whether the performance levels of firms may be associated with different strategy processes that are reflective of the substantive differences in how firms choose to compete (Slevin and Covin, 1997). It is assumed that the more complex the decision making tasks of organizations, the more analytical and interactive the strategy

making process (such as formal planning). In organizations where there are minimal decision-making tasks, the strategy making process is conducted without much analysis or consultation (such as emergent planning). Such observations offer many research opportunities for scholars in the field of strategic management. In addressing the question of strategy process and its role in new ventures, this study will attempt to address some of the questions raised in previous studies: What strategy process do new ventures employ? What role does a new venture's firm strategy play in the selection of its strategy process? Do new ventures exercise a mixing of strategy processes? On a continuum, to what degree is a new venture's strategy process more formal or emergent? Is there a relationship between the strategy process a new venture employs and its level of performance? While minimal attention has been given to these inquiries, it is hoped that the outcome of this study will offer insight to the depth of these questions.

Moderating Role of Environmental Turbulence

An organization's business environment and its strategy have been hypothesized and empirically demonstrated to have significant effects on performance (Porter, 1980; Scherer, 1980). Much scholarly work has been dedicated to the examination of the relationships among environment, strategy, and performance variables (Hambrick, 1986; Hitt, Ireland, and Stadter, 1982; Jauch, Osborn, and Gluck, 1980). In the field of industrial organizational economics, much emphasis has also been placed on the linkage between environment and performance where environments have been found to be primary determinants of performance (Porter, 1981). Such works, however, did not address the potential of environments as moderators of the relationship between strategy and performance. In the field of strategic management, a review of the literature reveals that some attention has been given to the relationship between strategy and performance and considered environments as moderators of that relationship (Prescott, 1986). This study attempts to contribute to that body of knowledge by examining the moderating role of the environment on the strategy-performance relationship.

A review of the literature indicates that numerous dimensions of the organization's environment including environmental turbulence, complexity, uncertainty, dynamism, hostility, munificence, stability, and heterogeneity have been demonstrated to impact strategic processes (Emery and Trist, 1965; Keats and Hitt, 1988; Fredrickson and Mitchell, 1984; Miller, Droge, and Toulouse, 1988; Lumpkin, 1996). Of these dimensions, the concept of environmental turbulence is selected for examination in this study. Environmental turbulence is described as an environment that is both dynamic and complex, it changes both frequently and unpredictably, and embodies many inter- and intra-organizational linkages (Miller and Friesen, 1983;Eisenhardt and Bourgeois, 1988). Similarly, environmental turbulence is further defined as the combined measure of the changeability and predictability of the organization's environment (Ansoff and McDonnell, 1990). Changeability is characterized by the complexity of the environment and relative novelty of the successive

challenges, which the firm encounters in the environment. Predictability is characterized by the rapidity of change, which is the ratio of the speed with which challenges evolve in the environment to the speed of the firm's response and visibility of the future, which assesses the adequacy and the timeliness of information about the future. As the competitive environment becomes more turbulent, firms might be expected to evolve from reliance on a single mode of strategy making to a multiple mode strategic process (Hart and Banbury, 1994). Research findings suggest that the characteristics of the environment have been found to influence decision making through managerial perceptions (Miles and Snow, 1978). In this regard, environmental turbulence is measured by management's perception of environmental complexity and familiarity of events, rapidity of change, and visibility of the future. In its original form, environmental turbulence is distributed along a scale ranging from stable to moderate to turbulent. This approach to environmental turbulence constitutes a continuum rather than a number of discrete types to reflect the degree of activity occurring in the firm's environment (Ansoff and McDonnell, 1990).

In strategic management, an ongoing concern for researchers has been how to establish and maintain a match between the external and internal environments. It is figuratively observed that organizations are systems of elements, each of which affect and is affected by the others (Scott, 1992). Accordingly, the external environment is a body of constant change, often unpredictable, challenging many organizations to correspond with the change, lest be victims of it. To survive, managers of organizations must identify a "fit" (Itami, 1987) with the environment. Once the fit has been identified, managers must align strategies, systems, and processes in order to achieve optimal performance. These findings suggest that there must be a fit between an organization's firm strategy and its strategy process to achieve optimum performance. The moderating effects model (Venkatraman, 1989b) suggests that environmental turbulence must be included in order to correctly specify the relationship between the organization's firm strategy and its strategy process, which is necessary to achieve optimal performance.

Organizational Performance

In this study, performance will be based on subjective perceptual, self-report measures derived from respondents. Several reasons support the decision to use this type of measurement method. Researchers have indicated reluctance from owners and/or managers to provide reliable objective measures of performance such as financial performance data (Sapienz, Smith,, and Gannon, 1988). Prior research has also revealed that subjective measures can be consistent with objective measures of performance (Dess and Robinson, 1984; Venkatraman and Ramanujam, 1987). This finding lends support to the approach that will be used in this study. A three year time frame was selected to obtain an overall measure and lessen the impact of variation due to short-term conditions (Lumpkin, 1996). Although prior researchers have asked respondents to estimate a five year average (Dess and Robinson, 1984), the shorter time frame appears appropriate for studying

new ventures. Requesting respondents to compare themselves with competitive peers and using weighted measures was designed to minimize performance differences that may result from industry effects (Dess, Ireland, and Hitt, 1990). Since, firm performance is "multidimensional . . . a balanced attainment of many goals" (Kirchoff, 1978), multiple measures of performance are needed to reflect alternative criteria for success.

Based on these practical and theoretical considerations, components of firm performance that will be measured in this study include sales growth, net profit margin, gross profit, net profit after taxes, financial strength (liquidity and ability to raise capital), employee morale, job satisfaction, commitment to firm's objectives, overall firm performance, planning performance, and firm market share (Pearce, Freeman, and Robinson, 1987; Dess and Robinson, 1984; Gupta and Govindarajan, 1984). The organization's performance will be rated relative to competitive peers over a three-year time horizon.

The following hypotheses were formulated based on the review of the research literature:

Hypothesis 1a: First movers employing a mixed strategic process will perform better than first movers employing either a formal or emergent strategic process.

Hypothesis 1b: Second movers employing a mixed strategic process will perform better than second movers employing either a formal or emergent strategic process.

Hypothesis 2a: First movers will be closely associated with an emergent strategic process than second movers.

Hypothesis 2b: There will be a significant difference between first movers and second movers using a mixed strategic process.

Hypothesis 2c: There will be a significant difference between first movers and second movers employing a formal strategic process such that second movers will be more likely to employ a formal strategic process more frequently than first movers.

Hypothesis 3: First movers will display higher levels of environmental turbulence than second movers.

Hypothesis 4a: The relationship between first mover strategy and the type of strategic process the firm employs will be moderated by the level of environmental turbulence. First movers in a stable environment are more likely to employ a formal strategic process more frequently than second movers.

Hypothesis 4b: The relationship between first mover strategy and the type of strategic process the firm employs will be moderated by the level of

environmental turbulence. First movers in a moderate environment will be strongly associated with a mixed strategic process.

Hypothesis 4c: The relationship between first mover strategy and the type of strategic process the firm employs will be moderated by the level of environmental turbulence. First movers in a turbulent environment will be strongly associated with an emergent strategic process.

Hypothesis 5a: The relationship between second mover strategy and the type of strategic process the firm employs will be moderated by the level of environmental turbulence. Second movers in a stable environment will be strongly associated with a formal strategic process.

Hypothesis 5b: The relationship between second mover strategy and the type of strategic process the firm employs will be moderated by the level of environmental turbulence. Second movers in a moderate environment will be strongly associated with a mixed strategic process.

Hypothesis 5c: The relationship between second mover strategy and the type of strategic process the firm employs will be moderated by the level of environmental turbulence. Second movers in a turbulent environment will be strongly associated with an emergent strategic process.

RESEARCH METHODOLOGY

Data were obtained from companies that have been in business in the high tech and biotech industry for no more than ten years. The study is cross-sectional with the objective of using a correlational approach (Cronbach, 1957) to test the hypothesized relationships. An online questionnaire served as the primary instrument for this study. This was followed by mailed questionnaires as well. A faxed approach was also undertaken to try to increase the rate of response.

For this research, data from businesses founded between 1990 to 2003 were used. This was done in an effort to capture the essence of a new venture company at its start-up stage. Respondents selected for participation in this study included chief executive officers, chief scientific officers, chief technology officers, presidents, vice presidents of business or corporate development, board chairman, managers, directors, or other high ranking mangers familiar with the company's strategic activities.

Research Sample and Methodology

Questionnaires were electronically mailed to the research sample along with a cover letter. A total of 1,832 electronic questionnaires were sent out. From the 113 responses received, a working

number of 86 responses were identified omitting any surveys that were not filled out or that exceeded the ten-year age requirement. The 86 completed surveys received from top executives or owners provided the final sample from which to draw as close to accurate inferences about characteristics that are representative of the population.

Instrumentation

A questionnaire was developed which consisted of scaled, multiple choice, multiple response, and open-ended questions. The scaled questions included 7-point Likert type scales, 7-point Semantic Differential scales, and Checklist item rating scales. The questionnaire was divided into seven sections relevant to the variables defined for the research model as well as a section for boundary control questions. Headings and numbering of questions were used to distinguish between categories of questions.

The questionnaire was developed with the expectation that the respondent would be a member of the organization who would be familiar with the three-year period in query. A filtering question was placed at the beginning of the questionnaire.

RESULTS

Descriptive Statistics for Sample

This section contains descriptive statistics and frequencies of the research variables used in this study (Table 1) as well as elements of the research variable in some cases. The research variables were calculated from the responses to the online and mailed surveys. Among the 113 responses received, only 86 met the requirements to be used in this study. This study controlled for firm age, which was measured as the number of years the firm had been in existence. Based on the year the company was founded, this study required the "new venture" to be less than ten years old during the duration of this study or founded no earlier than the year 1990. Of the entire sample, two surveys that did not contain any data were omitted and 25 were not included in the study because they did not meet the age boundary imposed by the control variable.

In Table 1, the frequency of responses by strategy type, first mover and second mover, is shown along with the research variables used in this study, which include strategic process and environmental turbulence.

Table 1: Table of Frequency of Responses by Strategy Type				
Variable		First Mover	Second Mover	Total
Strategic Process	Emergent	0	0	0
	Mixed	34	9	43
	Formal	31	12	48
Environmental Turbulence	Stable	8	8	16
	Moderate	55	13	68
	Turbulent	0	0	0

A performance index for first movers and second movers was established to rank organizational performance. The respondents were asked to use a 7-point scale that ranged from 1 "Low Performer" to 7 "High Performer." In addition, respondents were asked to rank the importance of each of the performance criteria using a 5-point Likert-type scale ranging from 1 "Not at all important" to 5 "Extremely important." These importance scores were multiplied by the performance scores to obtain an index for each firm. In Table 2, a summary of frequency for organizational performance is illustrated. Firms scoring 0 to 15 were grouped as "low performers," firms scoring 15 to 25 were grouped as "moderate performers," and firms scoring 25 to 36.75 were grouped as "high performers."

Table 2: Table of Organizational Performance Index by First Movers and Second Movers			
ORGANIZATIONAL PERFORMANCE	FIRST MOVERS N = 63; 2 missing	SECOND MOVERS N = 21	TOTAL N = 86
Low Performer	21	8	29
Moderate Performer	32	8	40
High Performer	10	5	15

Hypotheses Testing

In order to test the hypotheses, the data were divided into two groups: first movers and second movers. Table 3 show the results of an Independent-Samples t-Test that was run to determine significance of the mean difference in organizational performance among First Movers Employing Either an Emergent, Mixed, or Formal Strategic Process (N = 65). First movers reported they used either a mixed or formal strategic process. The results of the Independent-Samples t-Test used to test

for differences between the two groups can be seen in Table 3. It is important to note that none of the respondents reported using an emergent strategic process. The results indicate that there is no statistically significant difference in the mean organizational performance score for first movers (t = .079, p = .937) in regards to the strategic process they employ. Therefore, Hypothesis 1a is not supported.

Table 3: Difference in Organizational Performance among First Movers Employing Either an Emergent, Mixed, or Formal Strategic Process

Group	N	Mean	S.D.	t	Sig. (2-tailed)
EMERGENT	0	N/A	N/A	.079	.937
MIXED	34	17.88	8.04		
FORMAL	31	17.72	8.30		

In Table 4 results of the Independent-Samples t-Test for the significance of the mean difference in organizational performance among Second Movers employing either an emergent, mixed, or formal strategic process (N = 21) is shown. Second movers reported they used a mixed or formal strategic process. It is important to note that none of the respondents reported using an emergent strategic process. The results indicate that there is no statistically significant difference in the mean organizational performance score for second movers (t = .889, p = .386) in regards to the strategic process they employ. Hypothesis 1b is not supported.

Table 4: Mean Difference in Organizational Performance among Second Movers Employing Either an Emergent, Mixed, or Formal Strategic Process

Group	N	Mean	S.D.	t	Sig. (2-tailed)
EMERGENT	0	N/A	N/A	1.047	0.308
MIXED	9	16.37	7.96		
FORMAL	12	19.52	8.44		

None of the respondents reported using an emergent strategic process. Therefore, no tests were run on Hypothesis 2a. However, the results do imply some important implications and will be discussed later in this paper.

In Table 5, the results of the Chi-Square Test for the significance of difference between First Movers and Second Movers using a Mixed Strategic Process was supported (N = 86). The results indicate that there is a reliable difference in the number of respondents who chose a mixed strategic process such that significantly more first movers were found using a mixed strategic process than second movers (chi-square with 1 degree of freedom = 12.902, p < .000). Hypothesis 2b was supported.

Table 5: Significance of Difference between First Movers and Second Movers Using a Mixed Strategic Process

Group	Observed N	Expected N	Chi-Square	df	Asymp. Sig
FIRST MOVERS	32	20.5	12.902	1	0.000
SECOND MOVERS	9	20.5			

Table 6 presents the results of the Chi-Square Test for the significance of difference between First Movers and Second Movers using a formal strategic process (N = 86). The results of the Chi-Square test do not support the research hypothesis 2c. However, the results indicate that something systematic operates such that there are significantly more first movers found using a formal strategic process than second movers (chi-square with 1 degree of freedom = 8.395, p = .004).

Table 6: Significance of Difference between First Movers and Second Movers Using a Formal Strategic Process

Group	Observed N	Expected N	Chi-Square	df	Asymp. Sig
FIRST MOVERS	31	21.5	0	1	0.004
SECOND MOVERS	12	21.5			

Hypothesis 3 was not supported. The results of the Independent Samples t-Test for the Significance of the mean difference in Levels of Environmental Turbulence between First Movers and Second Movers (N = 86) is presented in Table 7. The results indicate there is no statistically significant difference in the mean level of environmental turbulence between first movers and second movers (t = 1.681, p = .097). However, there is a marginal significance of p = .09 such that

first movers showed a higher average on environmental turbulence scores (3.642) than second movers (3.388).

Table 7: Significance of the Mean Difference in Levels of Environmental Turbulence between First Movers and Second Movers

Group	N	Mean	S.D.	T	Sig. (2-tailed)
FIRST MOVERS	62	3.642	.574	1.681	0.097
SECOND MOVERS	21	3.388	.661		

In testing Hypotheses 4a, 4b, and 4c a table of frequency matching level of environmental turbulence scores and strategic process type for First Movers is found in Table 8.

Table 8: Table of Frequency Matching Level of Environmental Turbulence Scores and Strategic Process Type for First Movers

Environmental Turbulence	Strategic Process			
	EMERGENT	MIXED	FORMAL	Total
Stable	0	4	4	8
Moderate	0	29	26	55
Turbulent	0	0	0	0
Total	0	33	30	63

The relationship between first mover strategy and the type of strategic process the firm employs moderated by the level of environmental turbulence was tested and did not garner the support anticipated.

Table 9 shows the results of the Chi-Square Test on the moderating role of stable environment scores on the employment of a Formal, Mixed, or Emergent Strategic Process Among First Movers (N = 63). These results indicate that stable environment does not have a moderating influence on the relationship between first movers and the type of strategic process they employ (chi-square with one degree of freedom = 3.83, $p > .05$). First movers in stable environments did not employ a formal strategic process more frequently than a mixed strategic process. It is also noted that none of the first mover new ventures operating in stable environments reported using an emergent strategic process.

Table 9: Moderating Role of Stable Environment Scores on the Employment of a Formal, Mixed, or Emergent Strategic Process among First Movers					
Group	Observed N	Expected N	Chi-Square	df	p
EMERGENT	0	2.6	0	2	>.05
MIXED	4	2.6			
FORMAL	4	2.6			

Hypothesis 4b was supported. The results of the Chi-Square Test is presented in Table 10. The results indicate that something systematic happened such that more first movers who rated environmental turbulence as moderate chose either a mixed or formal strategic process over an emergent strategic process (chi-square with 2 degrees of freedom = 27.72, $p < .01$ or better). The results statistically support the hypothesis that first movers in moderate environments are more likely to employ a mixed strategic process. None of the respondents reported using an emergent strategic process or rated the level of environmental turbulence as turbulent. Therefore, no tests were run on Hypothesis 4c.

Table 10: Moderating Role of Moderate Environment Scores on the Employment of a Formal, Mixed, or Emergent Strategic Process among First Movers					
Group	Observed N	Expected N	Chi-Square	df	p
EMERGENT	0	18.33	0	2	<.01
MIXED	29	18.33			
FORMAL	26	18.33			

Table 11 presents the findings relevant to Hypotheses 5a, 5b, and 5c testing the relationship between environmental turbulence scores and strategic process type for Second Movers.

Table 11: Table of Frequency Matching Environment Turbulence Scores and Strategic Process Type for Second Movers				
Environmental Turbulence	Strategic Process			
	Emergent	Mixed	Formal	Total
Stable	0	3	5	8
Moderate	0	6	7	13
Turbulent	0	0	0	0
Total	0	9	12	21

Hypothesis 5a was not supported. Table 12 presents the results of the Chi-Square Test on the Moderating Role of Stable Environment Scores on the Employment of a Formal, Mixed, or Emergent Strategic Process Among Second Movers (N = 21). These results indicate that a stable environment does not have a moderating influence on the relationship between second movers and the type of strategic process they employ (chi-square = 4.876, p > .05).

Table 12: Moderating Role of Stable Environment Scores on the Employment of a Formal, Mixed, or Emergent Strategic Process among Second Movers

Group	Observed N	Expected N	Chi-Square	Df	p
EMERGENT	0	2.6	4.876	2	>.05
MIXED	3	2.6			
FORMAL	5	2.6			

Hypothesis 5b was supported and the findings are presented in Table 13. The results of the Chi-Square test indicate that something systematic happened such that more second movers who rated environmental turbulence as moderate chose a mixed and formal strategic process over emergent strategic process (chi-square with 2 degrees of freedom = 6.66, p < .05). The results statistically support the hypothesis that second movers in stable environments are more likely to employ a mixed strategic process. Note: No respondents reported using an emergent strategic process or rated the level of environmental turbulence as turbulent. Therefore, no tests were run on Hypothesis 5c. However, the results do imply some important implications and will be discussed in the findings section of this paper.

Table 13: Moderating Role of Moderate Environment Scores on the Employment of a Formal, Mixed, or Emergent Strategic Process among Second Movers

Group	Observed N	Expected N	Chi-Square	df	Asymp. Sig
EMERGENT	0	4.33	6.66	2	<.05
MIXED	6	4.33			
FORMAL	7	4.33			

Additional Findings

This section presents an analysis of additional findings and patterns of the statistical analysis found in data that were not specifically addressed by the research questions designed for this study.

In the previous section, statistical tests were conducted to determine the relationship between firm strategy and strategic process. The results indicated no respondents were found using an emergent strategic process. A table of the observed frequencies is shown in Table 14.

Table 14: Observed Frequencies of Strategic Process of First Movers and Second Movers

	Emergent	Mixed	Formal	Total
First Movers	0	34	31	65
Second Movers	0	8	13	21
Total	0	42	44	86

The Chi-Square results are shown in the following table (Table 15) between Firm Strategy and Strategic Process (N = 86). The resulting Chi-Square test indicates that something systematic operates such that fewer first movers and second movers reported using an emergent strategic process than would be expected due to chance alone. Note that no respondents in either group reported using an emergent strategic process. Results are significant at the .01 level. The implications of this finding will be discussed later in this paper.

Statistical tests could not be run to determine the moderating effect of a turbulent environment on first movers (Hypothesis 4c) and for second movers (Hypothesis 5c) and the strategic process they are likely to employ. This was due respondents' scores, which indicated operating in either a stable or moderate environment, whereas, none indicated operating in a turbulent environment.

Table 15: Results of the Chi-Square Test between Firm Strategy and Strategic Process

Group		N	Chi-Square	df	P
FIRST MOVERS	Emergent	65	32.71	2	<.01
	Mixed				
	Formal				
SECOND MOVERS	Emergent	21	11.14	2	<.01
	Mixed				
	Formal				

In Table 16, the observed frequencies of Level of Environmental Turbulence of First Movers and Second Movers (N = 84).

Table 16: Observed Frequencies of Level of Environmental Turbulence of First Movers and Second Movers				
	Stable	Moderate	Turbulent	Total
First Movers	8	55	0	63
Second Movers	8	13	0	21
Total	16	68	0	84

In Table 17, the results of the Chi-Square Test between Firm Strategy and Strategic Process is presented (N = 84). The resulting Chi-Square test indicates something systematic operates such that fewer first movers and second movers reported operating in a turbulent environment than would be expected due to chance alone. Note that no respondents in either the first mover or second mover group reported operating in a turbulent level of environmental turbulence. Results are significant at the .01 level for first movers and .05 level for second movers.

Table 17: Results of the Chi-Square Test between Firm Strategy and Strategic Process					
Group		N	Chi-Square	df	P
FIRST MOVERS	Stable	63	65.13	2	<.01
	Moderate				
	Turbulent				
SECOND MOVERS	Stable	21	6.0	2	<.05
	Moderate				
	Turbulent				

DISCUSSION AND IMPLICATIONS

This study revealed some interesting findings in regards to the influence of environmental turbulence on the strategy-performance relationship among high tech and biotech new venture companies. The outcomes of the study are noteworthy especially in regard to the strategy formulation process of first movers and second movers in the high tech and biotech industry. The findings discussed in this section offer important implications and contribution to the field of strategic management, both to the academician and the practitioner. The detailed findings of each of the variables will now be discussed.

Strategic Process

Much of the debate and discussion in the strategic management literature stem from the following question, "Which strategy process results in superior performance?" This study explored strategic process along an emergent to formal continuum. The findings showed no relationship between firm strategy and strategic process. Therefore, there is no evidence to support that the position a company pursues, be it first mover or second mover, has any influence on how strategy is formulated. Though, looking at strategic process in a categorical perspective, the findings revealed that first movers are more likely to employ a mixed strategic process than either a purely emergent or a purely formal crafting process. This finding is in line with scholars who have argued that a mixing of both formal and emergent strategy processes is possible (Mintzberg, 1973; Lorange and Vancil, 1977; Nutt, 1976), where "some stages of strategic decision making require formal processes while others call for an emergent one" (Nutt, 1977).

The choice to use either process may be contingent on the nature of the decision and the business orientation of the company involved. It is characteristic for first movers to position themselves for competitive advantage by being the first to introduce a new product or service in their industries. To do this effectively, the finding of this study, in line with previous research, asserts that a business' strategy process must possess a mix of both formal and emergent qualities (Mintzberg, 1994; Hax and Majluf, 1988). This study also found that second movers are more likely to employ a formal strategic process than a mixed or emergent process. Thus, second movers who use a formal strategic process are likely to engage in behavior consistent with developing a formal plan with ends that are specified first and then only after the ends have been specified is strategy implemented. This could be attributed to the features associated with second mover strategy, which involves a wait and see approach. In evaluating first movers' experiences, second movers gain their advantages by picking up on the weaknesses of first movers, which may include product or service improvements, evaluation of customer response to implement better ways to market or sell, and technology improvements. A focus on quality products or services and not being first to market seems to go hand in hand with a formal strategic process. The findings of this study question the claim of Nelson and Winter (1982) who stated that firms relying on a single mode of strategic process might suffer from limitations and biases. Rather, the findings of this study reveal that second movers who employ a formal strategic process rated themselves as higher performers than those second movers who used mixed strategic modes. Interestingly, there was no empirical evidence to support that the type of strategy process a firm uses, either formal or mixed, will affects its organizational performance. This applies to both first mover and second mover new venture companies. The question raised by Schendel (1975) regarding which model of strategy formulation results in superior performance remains unanswered. This is a fundamental question in the field of strategic management, which continues to demand scholarly attention and explanation. It is surprising that the results of this study

did not provide any evidence of a correlation between strategy formulation and organizational performance.

It is interestingly noted that none of the managers of the high tech and biotech companies who participated in this study reported using an emergent strategic process. In consideration of this phenomenon, it is not likely that this finding was due to measurement error given that this study utilized the scale developed by Slevin and Covin (1997), which is widely accepted in the strategic management field. Such an occurrence sparked great curiosity while at the same time, raised some serious inquiries for further research consideration. Nonetheless, this study is premised on the assumption that managers answered the questions honestly and understood what was being asked of them. Therefore, based on that premise and on the findings, it could be inferred that high tech and biotech new venture firms do not use a pure emergent process to formulate strategy. The findings imply that organizational strategy is still carefully planned out and understood before any significant competitive action is taken. It is apparent that formal plans still serve as the basis for competitive actions even within a rapidly changing and tumultuous environment as the high tech and biotech industry. In such an industry, new ventures are inherently subject to incidences of trial and error actions due to content that may not be lucid or comprehensible. In consideration of the industry characteristics and in line with the results of this study, it is suggested that a formal process has served second movers quite reasonably. But for first movers, a formal process combined with aspects of an emergent strategy process, may offer a more appropriate course to embrace. First movers understand that while they have laid out formal plans, they may be subject to situations where it may be necessary to allow room for strategy to emerge over time. This is imperative to the firm's survival and success. A combination of emergent and formal strategy formulation is important to first movers employing a mixed strategy process.

There is no ready explanation to account for why new ventures in the high tech and biotech industry did not indicate using an emergent strategic process. Perhaps, no respondent chose an emergent strategy process due to the nature of the industry studied. Based on this phenomenon, there is a clear need to rethink the distinctions made by theorists of the distinct emergent, mixed, and formal strategy types. In examining the strategic management literature, it became apparent that there is great inconsistency in the field. This research study was prompted by much of that inconsistency with hopeful pursuit to arrive at some propitious explanation or semblance of convergence. However, that was not the case and the questions are even more baffling. This study adopted the contingent perspective that new venture companies in the high tech and biotech industry operated in an environment that was loosely defined, grappling with uncertainty, and unpredictable. Thus, it was hypothesized that an emergent strategic process would correspond with such an environment. This hypothesis was consistent with the findings of Fletcher and Harris (2002) who claim that entrepreneurial organizations, such as high tech and biotech new ventures, increasingly rely on emergent strategy development rather than a formal planning process. The results of this study proved otherwise. Managers of the high tech and biotech new ventures who participated in this

study neither reported operating in a turbulent environment, nor reported using an emergent strategic process. This was an astounding finding and begs the question, "What does it mean?" Does this finding mean that new ventures in the high tech and biotech industry do not use an emergent strategic process? Based on this research, can it be deduced that the strategy process consists only of mixed and formal strategy behaviors? Could it be possible that the downfall of the dot-coms in the late 1990s to early 2000s may have contributed to this phenomenon? Presumably, those dot-coms that failed used an emergent strategic process, which accounts for none of the respondents of those surviving firms reporting use of an emergent strategic process. Consequently, it can be articulated that those firms that endured the anguish of the dot-com bubble burst survived using a mixed or formal strategic process.

Based on that assumption, could it be additionally deduced that more formal strategic planning is being used by new ventures operating in the high tech and biotech industry. This assumption prompts thoughtful contemplation mottled with inquiry. For many companies, formal planning, has proven itself valuable resulting in improved profits and growth. Formal planning offers an explicit process to determine a firm's objectives and procedures to generate and implement strategy. This systematic procedure offers a sense of security due to its clear, transparent nature. It seems that managers of companies in its early stages of the life cycle, such as start ups and emerging companies would be more likely to engage in activities such as those found in formal strategy processes. It seems that the unsettling aspect of starting up a new business would already be too overwhelming to managers who then would most likely reject the opportunity to engage in activities consistent with an emergent strategy. This presumption is supported in a study by Armstrong (1982), who indicated that environmental change was a big factor in firms using formal planning for strategic decision making. Respondents in Armstrong's (1982) study thought that formal planning was less appropriate when change was rapid. Thus, the more complex the environment, the higher the need for a plan to ensure that things will operate smoothly.

Alternatively, another research offers yet another perspective to explain the surprising findings of this study. Lynch (2002) points out that despite the work of Mintzberg, Stacey, Brown and Eisenhardt, the school of emergent strategy "is less developed than other schools." This could serve as an explanation as to why managers may not be using emergent strategy; perhaps managers are not familiar with the opportunity and inventiveness offered by an emergent strategy process. Could it be that managers deem the process of emergent strategy as passé? With the ephemeral dot-com phase long gone, managers who participated in this study may not have felt comfortable admitting that they use an emergent strategy process.

In reflection of the findings, consideration is given to the role of the life cycle of the organization and its possible effect on the type of strategic behavior the firm may employ. For many companies in the high tech and biotech industry, the early stages can best be described as ambiguous and uncertain. New ventures in the start up and emergence stage are tasked with seeking seed capital in their early stage and as they go through the rounds of funding, may be subject to a number of

changes in the organization which may greatly affect the manner in which strategy is formulated in these companies. Studies have found that an entire funding cycle would take a minimum of five years, but experts claim the internet has shortened that time horizon saying now it could take anywhere from 24 and 36 months to complete the funding cycle (Klein, 1999). It is presumed that companies that pass the early stages of start up and emergence and move into the growth stages may experience greater stability in terms of funding and development of the organization. It is presumed that this stability could contribute to a more established behavior in terms of strategy formulation within the organization after about three to five years of the company's existence. It is further asserted that companies older than five years would have a well established strategy that may allow for clearer distinctions among or between the strategy types studied in this research.

Another consideration that must be accounted for in regards to the findings related to the firm's strategy process, is the mentality of top executives of high tech and biotech new ventures. It is understood that managers who lead companies in the high tech and biotech industry possess a mentality filter (Ansoff, 1990) that may be quite different from that of managers of traditional organizations. While the literature in the field of strategic management is beset with findings that offer academic explanations for strategic behavior and how certain processes may be more appropriate under different conditions or may offer optimal performance outcomes if one strategy process is used over another, it may not be adept at capturing the reality of the strategic process in actual practice. It is acknowledged that further research in this area is imperative to make more accurate conclusions and to offer research results that are current and representative of today's fast growing and continuously adaptive business organizations.

Environmental Turbulence

The findings indicate that there was no significant difference between first mover and second mover new ventures and level of environmental turbulence. The research findings support that both first movers and second movers who rated their environment as moderate were more likely to be associated with a mixed strategic process than a formal one. The results of this study provides empirical evidence which supports that new ventures operating in moderate levels of environmental turbulence would be very likely to engage in strategy formulation behavior that ranges somewhere between two extremes where in one instance, strategy is carefully planned serving as the basis for competitive action and, in the other instance, strategy is "typically not planned in advance, but rather emerges over time." To strike some type of balance between these two extremes would serve as the best means for achieving objectives. In addition, there was no conclusive finding to support that environmental turbulence played a moderating role in the strategy formulation process as suggested by Prescott (1986).

Surprisingly, the findings of this study indicate that the relationship between stable environment and formal strategic process was insignificant. Another important and interesting

finding in regard to environmental turbulence was that none of the high tech and biotech executives rated the environment as being turbulent. This is inconsistent with the findings of research conducted on firms in the West, which indicate that ventures are more likely to be successful with product innovation strategy in turbulent environments (Li and Atuahene-Gima, 2001; Covin and Slevin, 1989). This interesting phenomenon would suggest that perhaps this undiversified sample of top executives of high tech and biotech new ventures may have contributed to this occurrence and requires further research attention.

Additionally, the findings reveal that new ventures with high levels of proactiveness are likely to experience changes in the environment that are new and have never been experienced before. These new ventures will also find change occurring much faster than the organization's ability to respond and visibility of the firm's future is obscure and not clear at all. Firms with low levels of proactiveness are likely to describe their company as operating in environments that are repetitive, where change is slow or nonexistent, and visibility of the future is very clear.

In contemplating the results of environmental turbulence, it is speculated that managers who operate in the high tech and biotech industry may be biased in how they regard the environment of the firm and may explain how these managers see high turbulence as a "way of life" that blurs their ability to make an accurate distinction of the company's true level of turbulence. The high tech and biotech industry is regarded as a highly turbulent environment, thus, managers who operate in this environment are constantly subject to rapid changes, fierce competition, and uncertainty on a daily basis. This daily exposure to such turbulence may minimize managers' perceptions of turbulence in the high tech and biotech industry environment. It is suggested that this environmental turbulence observation be considered in future studies and is deemed an area that requires further research attention.

Other Findings

High performers of both groups were examined. The following are characteristics of first movers in the high tech and biotech new ventures who participated in this study. Those first movers who rated their company as high performers, in this study, were found to employ a mixed strategic process; rated their environment as moderate. Second movers in this study who rated their company as being high performers were found to have employed a formal strategic process; rated their environment as stable.

Limitations

The following limitations not foreseen in this study include a sample size that was rather small for making powerful conclusions, especially for the split sample hypotheses, which examined differences between first movers and second movers. The sample was not as large as first hoped for

and the reliability of the findings could be improved with a larger sample and a more even split between groups. The sample used in this study was confined to only the available sources of high tech and biotech new venture or start up listings. Most companies that responded are from San Diego and southern California. The database was built on lists of organizations based in San Diego and southern California. Another limitation includes the self-report measures that were used to collect data. Only one person from top management was asked to respond to the survey. No other managers were involved in the study. The responses were based solely on their personal perceptions of the respondents.

Conclusions

Based on the findings of this research, top executives of high tech and biotech new ventures are encouraged to take the following measures and actions in order to enhance their strategy-performance outcomes. It is suggested that top executives of new ventures pursuing a first mover strategy employ a mixed strategic process, which integrates characteristics of emergent and formal planning behaviors. This requires the firm to engage in strategy formulation behaviors that may be formal on some characteristics and simultaneously emergent on others. It is true that managers need planned strategy in order to provide a sense of purpose and direction for their company, but emergent strategy is needed as well in order that simultaneous learning and action will lead to discovery of a viable path. It is highly suggested that managers position their new venture strategy formulation somewhere along the continuum between formal and emergent strategies. This study also suggests that new ventures pursuing follower strategies may also experience some success in using formal planning strategies where the ends are specified and courses of action are based on a deliberate and systematic method supportive of those goals. Moderate levels of environmental turbulence were found to influence both first movers and second movers of high tech and biotech companies to employ a mixed strategic process.

Summary

This study provided empirical support for the influences of entrepreneurial orientation, focus of attention, and environmental turbulence on the strategy-performance relationship. This research offers some contributions to both the theory and practice of management. It has established support for (a) the difference between first movers and second movers and the use of a mixed strategic process; (b) the difference between first movers and second movers and the employment of a formal strategic process; (c) partial support for the moderating effect of environmental turbulence on first movers and second movers and the type of strategy process they employ; and (d) established a list of supplemental findings revealing additional relationships and areas for future research.

Recommendations for Future Research

While this study offered interesting research findings, it is again acknowledged that it also holds some limitations. For many of the assumptions planned in this study, it was not possible to verify significant outcomes due to possible latent errors. Although, not conclusive, the features of this study did offer reasonable support for the hypotheses. In consideration of this actuality, the outcomes of this study point to opportunities for future research. The following recommendations are suggested for future research. Research indicates that firms pursue different strategies across different industry contexts and that particular strategic behaviors may be more appropriate depending on the stage (Fahey and Christensen, 1986). It is recommended that further research into the life cycle of high tech and biotech firms to establish growth stages of the industry is need. Research is recommended to include all high tech and biotech companies at different stages of the life cycle. It is suggested to further research why high tech and biotech firms did not report using an emergent strategic process; some rethinking is required to determine the extent of differences among the distinct categories of strategic process; are there really strong differences among the strategy process types and, if so, how are they different? Also, research to determine why high tech and biotech firms did not report operating in a turbulent environment is another area for future consideration. Research into the strategy formulation process based on descriptive information from executives of high tech and biotech companies is necessary. In future, the development of a research instrument to measure firm performance that may be more applicable to new venture companies. Future research incorporating leadership constructs and its effect on perceived levels of environmental turbulence and strategy process is another viable area for further study. It may also be interesting to conduct research comparing new ventures backed by venture capital and other new venture companies.

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ACCESS, AFFORDABILITY, PREVENTION: REPORT OF FINDINGS AND OPTIONS FOR GUAM'S UNINSURED

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ABSTRACT

The initial study of Guam's uninsured provides a snapshot of the number of uninsured, perspectives of affected groups, and a general preference for a health system that provides access, affordability, and prevention. From data gathered in the Guam 2005 Household Income and Expense Survey (HIES), the Health Survey Supplement (HSS), focus group meetings, and the Guam Health Summit, this study points to key determinants of Guam's uninsured as of 2005. It establishes a baseline from which to build and evaluate local health system reforms to expand health insurance coverage.

INTRODUCTION

There has been some success in reducing the price of some medical procedures, yet overall U.S. health care costs have risen 54 percent in the past five years (Thorpe, 2005). Demand for health care continues to rise, driven in part by demographics, advances in medical treatments, and direct consumer advertising of health services and products. The combination of increased utilization and increased costs all but assure s that households, businesses, and government spend more for health care.

As current health care costs outpace employee wages and inflation, how we pay for health care has also come under pressure. With rising medical costs, it is no surprise that health insurance is less affordable than in the past. In response, employers are reducing benefits and shifting costs to employees; government is setting eligibility limits and restructuring programs; households, especially middle class families are choosing to self-pay for primary medical care and look to government to subsidize catastrophic illnesses. Currently, 60 percent of U.S. employers offer health insurance coverage to their workers—the lowest rate in the past decade (Gabel, J. et al., 2005). These and other changes in the U .S. health system trigger great uncertainty about future health care quality and cost.

Guam, a U.S. territory, faces similar challenges—perhaps to a greater degree than other U.S. communities. With nearly 94 percent of businesses employing fewer than fifty workers, most

businesses on Guam are small businesses.[1] As the U.S. system of health care depends on private health insurance through employment, many of Guam's workers do not have access to insurance through their workplace—a well -documented problem for small businesses (Glover, S.H. et al., 2000). For Guam it is one of several critical explanations for why its rates of uninsured are higher than U.S. averages. This study examines data from the 2005 Household Income Expense Survey, the Health Survey Supplement, and other data from focus group meetings to uncover the issues and possible remedies for Guam's uninsured.

GUAM'S UNINSURED

The Guam 2005 Household Income and Expense Survey found 6,199 or 17.2 percent of Guam's 36,117 households did not have health insurance. Of those with health insurance, 36.9 percent were affiliated with government programs; and 37.5 percent with private firms. The following section profiles Guam's uninsured—their demographics, employment, and health status—as well as Guam's health system and current policies.

Demographic Profile

There are many demographic factors, which describe Guam's uninsured. Age, race/ethnicity, gender, educational attainment, and income levels are the usual characteristics discussed in such profiles. Presented here are some of the highlights, an amalgam of factors, which characterize the demographic profile and special circumstance of Guam's uninsured.

Citizenship

One of the most striking elements of the profile of Guam's uninsured is citizenship. It appears from HIES data that citizenship is a strong determinant of whether one has access to health insurance. Nearly 63 percent of Guam's uninsured households are headed by non-U.S. citizens. Of this 63 percent, 34 percent of households without health insurance are permanent, non-citizens. Another 28.3 percent of uninsured households are temporary non-citizens. U.S. citizens on living on Guam are also uninsured, but their reasons are likely different from those of non-citizens. Fifteen percent of naturalized citizens and 10.4 percent of households headed by citizens born in the United States or a U.S. territory are uninsured.

Of households headed by those born in the region and living on Guam, 12.2 percent do not have health insurance. This finding points to migration as a related factor. The Guam 2000 Census reports 115 people, not born on Guam, moved to the island for medical reasons. Another 92 persons reported that they came to Guam for subsistence. [2] While not documented in census findings,

migration for employment is also a likely reason, as many non-citizens are employed in Guam's construction, tourism, and service industries.

Place of birth of householders reported from HIES reveals that those born in China and Korea have the highest rates of uninsured at 69.9 percent and 58.5 respectively. Householders born on neighboring islands have the following rates of uninsured: Pohnpei 43.8 percent, Chuuk 32.6 percent, Yap 31.1 percent. Twenty-five percent of householders from Japan and 25.2 percent from the Philippines are without health insurance.

Education Level

In studies of the uninsured, educational attainment is a determinant of health insurance status. Higher rates of uninsured are correlated with lower levels of education and are assumed to be issues of access, affordability, and of valuing one's health. Affordable insurance is generally not available for low-wage/low -skill jobs. Guam's HIES data reveal expected findings in this regard. Heads of households whose highest level of educational attainment was the 6th grade had the highest uninsured rates at 36.9 percent.

The HIES data show some unexpected findings. The second highest level of uninsured, 26.3 percent, is reported for those who had attained a Master's Degree. The reason for this is unclear as it contradicts the assumption that those with higher levels of education and income have greater rates of insurance enrollment. This may be a segment of Guam's uninsured population that has been overlooked, given the assumption of higher education levels and health insurance status. Those whose levels of educational attainment were High School Diploma or Bachelor's Degree were lower at 15.8 and 15.5 percent, but remain high by U.S. comparisons.

Income Level and Unemployment Rate

Income and unemployment are particularly important, as access to health insurance is determined in large part by both. Guam has 56,810 persons employed and a reported rate of unemployment at 7.7 percent (CLFS, March 2004). Median household income on Guam is $33,457.[3] Twenty percent of Guam's households fall below the U.S. federal poverty level.[4] Median income for male wage earners on Guam is $28,125. The median income for female wage earners is $24,118.[5] Average hourly wages reported for non -supervisory workers was $11.03 in March 2004.

Guam's uninsured households are primarily those that earn less than $50,000 per year. The 2005 HIES study confirms that nearly 46 percent of Guam's uninsured wage earners earned between $10,000 to $24,999 per year; 30 percent earned $1 to $9,999 per year, 18 percent earned $25,000 to $49,999 per year, 3 percent earned $50,000 to $99,999, and less than 1 percent earned over $100,000 per year.

Age

Access to health insurance is also determined by age. Given the availability of government programs for the young and the elderly, one expects low rates of uninsured in these age groups. Yet Guam HIES data show comparatively higher rates of uninsured in all age groups compared with U.S. averages. Table 1 provides comparisons. Possible explanations for the differences in percent uninsured on Guam with U.S. averages need to be evaluated for cause. Unique to Guam is the relatively high numbers of senior citizens who identify themselves as uninsured. No comparison with U.S. rates for this age group is available, as U.S. seniors generally have health coverage from Medicare or Medicaid. Preliminary explanation finds Guam's seniors without health insurance are likely retired Government of Guam workers who were not enrolled in the U.S. Social Security system and did not contribute to Medicare and as a consequence are ineligible.

Table 1

Uninsured Demographics in the United States and Guam

	Percent Uninsured	
	U.S.	Guam
Population under age of 65 years	19	25
Children 18 years of age and younger	12	26
Young Adults aged 19-24 years	3.5	27.1
Total Population	15.6	22.6

Source: US Bureau of Census and Guam Household Income and Expense Survey 2005

Race and Ethnicity

Ethnic variation within age groups may be a contributing factor as Guam's uninsured were primarily Native Hawaiian and other Pacific Islanders (47.8%), Asians (34.5%), and those who declined to identify their ethnicity or race (10.8%). There were no Blacks who were uninsured, and 6.9% of the uninsured were White. No persons in the survey gave Hispanic as an ethnicity or race. Of all those surveyed, 51% were Native Hawaiians and Other Pacific Islanders, 33.6% were Asian, 4.9% were White, less than a half percent were Black, and 9.9% declined to identify an ethnicity.

Focus Group Findings

In addition to the HIES data, focus group meetings with the uninsured provided additional insight about contributing factors and for many their recent decision to be uninsured. Most were

members of working middle class families, were college students or recent graduates, or were small business owners. Each expressed a shared concern about the cost of health insurance and the lack of relative coverage benefits.

In the case of students and small business owners, most claimed that affordable coverage was not available to them at discounted rates. Students had investigated a program for health insurance coverage sponsored by a local university and found the price of $500 per month prohibitive. Almost all indicated that the price of health insurance had escalated beyond their means; in some cases exceeding their monthly take home pay.

In cases where families had the means to pay for health insurance, most found that the benefits were not worth the cost. With high premiums, deductibles, and co-payments these families believed it better to set aside money in their own bank accounts to pay for out of pocket expenses. Most were worried, however, that they would not have the means to pay for catastrophic illness, but believed that if such were to happen the Government of Guam would provide care from its Medically-Indigent Program (MIP) through the local hospital. From their point of view, the downside risk of self -insurance seems minimal.

Other comments from this meeting with the uninsured indicated that the process of managing claims forms and health receipts is burdensome. Keeping track of health expenses seemed to be more of a problem in high deductible plans. While no specific examples were mentioned, they indicated that the system that requires referrals, prior authorization, and advanced payment is becoming complicated for the average person, and especially so for the young, the elderly, and the less educated.

Guam's uninsured households appear to be conducting their own cost/benefit analysis and find the costs outweigh the benefits. They identify themselves as uninsured by choice —although not what they prefer. They would rather be insured at reasonable rates for which they realize some benefit of access to health coverage with limited out -of-pocket expenses, and minimal management.

Top five issues of the uninsured:	
♦	Gap between health care costs and what family can afford
♦	High deductibles and premiums make health insurance unattractive
♦	Complicated process, need education on insurance options
♦	Government assistance to provide direct subsidy for health insurance costs
♦	More public health services needed as private health care becomes less affordable

EMPLOYMENT PROFILE

Nearly 51 percent of Guam's uninsured heads of households were employed and reported working in the week prior to the HIES survey. Of uninsured wage earners, nearly 46 percent earned

between $10,000 to $24,999 per year; 30 percent earned $1 to $9,999 per year, 18 percent earned $25,000 to $49,999 per year, 3 percent earned $50, 000 t o $99,999, and less than 1 percent earned over $100,000 per year.

Public and Private Sectors

Guam's employment base is a mix of private businesses and public sector agencies of the federal and local government. In 2004, the mix of private and public sector jobs showed 74 percent of Guam's workforce employed by the private sector with 26 percent employed in public sector jobs. Within the public sector, the Government of Guam employed 20 percent.

Source of employment is an important consideration in understanding Guam's uninsured. Better health benefit programs are typically offered by large private employers and to employees of government agencies. With 74 percent of Guam's workers employed in the private sector and with of 94 percent of Guam's employers employing 50 or fewer workers, the potential for higher rates of uninsured is obvious.

Economic Condition

Recessionary pressures, continuing from the late 1990s, contributed to the closure of many of Guam's small businesses and reductions in full-time employment in others. With tax revenues declining, the Government of Guam was also looking for ways to reduce the numbers of persons employed and other cutbacks to benefits, such as health insurance premium contributions.

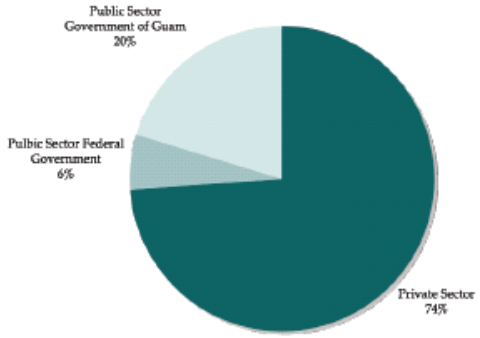
A look at employment patterns shows that unemployment in the past few years was as high as 11.4 percent in 2002 with current rate at 7.4 percent as of March 2004. Part-time employment also increased. In all, these factors contributed to rising numbers of individuals without health care insurance.

The 2002 Guam Economic Census reports that there were 43,104 persons on private sector payroll. Guam's leading industries are associated primarily with tourism and the military. Guam has an emerging service sector in health care and other professional services, particularly banking and insurance. Distribution of employment by industry type is shown in Chart 2. Nearly half of all full-time jobs on Guam are related to hotel and food services and retail trade. Part-time jobs are associated with these industries as well, although not reflected in the statistics of the Guam 2002 Economic Census.

In terms of full -time, year -round salaried jobs, Guam's largest private employment sector is Accommodation and Food Services with 26 percent of persons employed. Retail Trade accounted for 17 percent of Guam's private sector workforce, followed by Administrative Support Services accounting for 10 percent and Construction with 8 percent.

Chart 1

Employment Distribution: Public/Private Sectors



Source: Guam Statistical Yearbook 2004.

Employment Benefits

Most middle -income families rely on employment benefits to cover health insurance costs and a percentage of out -of-pocket medical expenses through co -payment plans. The rise in self-employment, underemployment and part-time jobs has resulted in a loss of health benefits by traditional means of employer sponsorship.

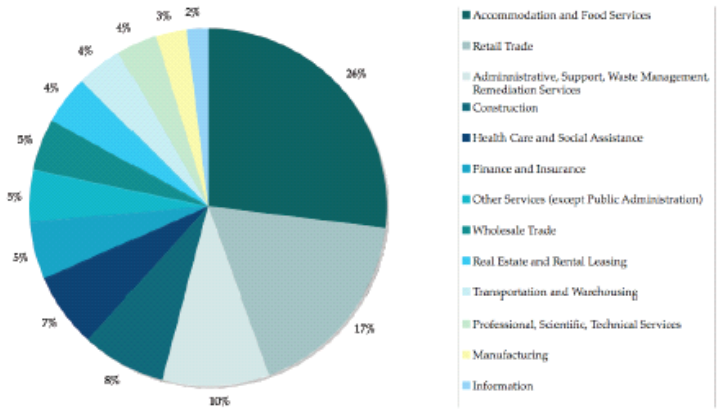
Findings of the 2005 HIES study confirm changes in employment benefits for Guam's workers with 16.7 percent of Guam's employed householders without health insurance. Of those employed by a private company on Guam, 19.8 percent did not have health insurance. Eleven percent of householders employed by the government had no health insurance. For those who indicated employment was not applicable for reasons of unemployment or retirement, 16.4 percent indicated that they had no health insurance coverage. Another 6.9 percent of householders working without pay were without health coverage.

Many of Guam's small business firms lack access to group rate s for their employees and have limited resources to pay for health insurance for their workers. Guam's large businesses are often corporate affiliates of U.S. national firms, such as Continental Airlines, Hyatt Hotels, and Citibank with greater access and resources to fund health insurance benefit programs. Unlike Guam's small businesses, these firms have more than fifty employees, making health insurance somewhat more affordable through group rates.

The meeting with Guam's small business owners revealed that many did not offer health insurance for the primary reason of access and affordability. Many indicated that as small businesses they were not able to attract the interest of insurance firms to negotiate health benefits for their employees. Small business owners noted related problems of recruiting and retaining their workforce. With lower wages and no health benefits, small business owners described themselves as attracting entry-level workers. Once trained, their workers tend to move to mid-level or large firms for higher wages and benefits. Thus, small firms face additional costs from not offering health insurance —the ability to retain a competent workforce.

Chart 2

Employment Distribution: Guam's Private Sector



Source: Guam Economic Census, 2002.

As a solution, some small business owners are banding together through affiliations of the Guam Chamber of Commerce, and ethnic business associations such as those being formed by Chinese and Korean business owners to pool companies into larger bargaining units to acquire affordable health insurance rates. Others, especially independent s mall businesses noted the need for government to grant tax relief to small business firms to purchase health insurance for their workers. Some expressed particular problems with current policies that give health insurance firms and other large employers tax breaks from the Government of Guam's Gross Receipts Tax (GRT).

Small business owners suggested that similar opportunities should be granted to them to use what they pay in GRT to fund affordable small business health insurance.

Some small businesses are encouraging their workers to enroll in the Government of Guam's Medically Indigent Program or to seek health services from the Public Health System. With low wages and no access to private health services, many of these workers are getting care from government agencies. Business owners noted that as they pay GRT, they advise their workers to use the Government's public health programs. This cost shifting is showing up in increased public health expenditures.

Representatives of Guam's larger businesses, those that employ fifty or more workers reported that they plan to continue to offer health benefits to their workers in spite of increased costs. They are seeking other options to reduce costs such as increased co-payment plans with higher deductibles. Others are reducing their share of the expense. Where some companies used to pay 100 percent of the premium, they now report reducing their share to 80 percent. Some have eliminated family coverage benefits; yet offer them to the employee to buy at their option. Surprisingly, many large businesses on Guam report that they expect to continue their benefits plans without much change, including 100 percent cost of coverage. They cite increased competition for talented workers, noting that health benefits are a mean to attract and retain a competitive workforce. Large businesses reported working well with insurance companies to keep premium prices affordable. They also reported good working relationships with health insurers in claims handling and cost analysis, which lessens the need for corporate HR personnel to attend to such matters.

While not part of the private sector interviews, the Government of Guam is the largest single employer with 11,610 employees.[6] Employers in the private sector noted that many of their newly hired workers had previously worked for the Government of Guam. They reported that these workers left local government service in search of better health benefits. Shifts in Guam's workforce appear to be taking place in favor of firms offering better health benefits programs.

Large firms also report better job stability as many of their workers continue employment to maintain health coverage and some reward longevity with better benefits. Large firms also commented on the need for government to provide some support to keep costs affordable. They noted the importance of public policy in shaping the ultimate costs of health care including tort reform, prescription medication costs, and especially on Guam, access to off-island care for specialized medical needs. They also noted that Government should offer tax incentives to businesses that offer health benefits and consider special insurance coverage for workers with high-cost medical conditions. In this way, businesses would be better able to reduce costs if high -risk employees could be hired without raising rates for other workers.

Both large and small employers reported a need to educate Guam's workforce on issues of health management: prevention strategies, plans selection; claims filing, and Health Savings Account (HSA) investments. Some Human Resource managers commented that they personally encourage employees to sign-up for employer sponsored health benefits. Surprisingly, they report

that young and unmarried workers tend not to enroll, even if the company provides 100 percent of the cost. Again, they point to the importance of consumer education and public service announcements about enrolling in health insurance programs.

HEALTH STATUS PROFILE

One of the more interesting differences between the insured and uninsured is reports of illness. Those who are insured report higher rates of diagnosed illness. This appears to hold true of data retrieved for Guam from the Health Survey Supplement conducted at the time of the 2005 HIES study.[7] While no follow-up study has been conducted for Guam's findings, other research suggests two main explanations —those who report illness have an incentive to seek health insurance; the uninsured may see themselves as either healthy and not needing coverage or are unaware of their health status as they do not have regular primary care.

The 2005 HIES study shows Guam's uninsured were less likely to report having diabetes (14.2 percent) than the insured (18.2 percent), and also less likely to report being hypertensive (23.3 percent of the uninsured and 32.7 percent of the insured). The uninsured were less likely to have ever had a cholesterol test (16.4 percent vs. 26.1 percent of the insured). Those who had tests were also less likely to report having been told their cholesterol was high. Sixty-five percent of uninsured had high cholesterol while 68.8 percent of insured did.

Diagnosis of asthma and heart disease appear to be different for the uninsured, which may be attributed to age-related factors. The uninsured reported higher rates of having ever had asthma (10.8 percent) than the insured (8.9 percent). However, in terms of current diagnosis, the uninsured had lower rates of current asthma (56 percent of those who ever had asthma) than the insured (71 percent). They also reported lower rates of ever having had a heart attack (3.4 percent vs. 5.7 percent), angina (2.6 percent vs. 4.9 percent), or stroke (3.4 percent vs. 3.7 percent) than the insured.

HEALTH SYSTEM PROFILE

Guam's health system is a mix of government and private health services, which provides for a population of 156,154.[8] Not surprisingly, the uninsured were less likely (52.2 percent) than the insured (75.7 percent) to report having a clinic or doctor that they usually go to for health care, but more likely to have not gone to the doctor at least once in the past year because of the cost (32.8 percent of uninsured vs. 11.9 percent of insured).

Public Health System

The Government of Guam administers the only civilian hospital, Guam Memorial Hospital (GMH) and provides health services through a network of public health facilities for medical, mental health, and disabilities.

There are four local government departments: Department of Public Health & Social Services (DPHSS), Department of Mental Health & Substance Abuse (DMSHA), Department of Integrated Services for Individuals with Disabilities (DISID), and Medical Referral Offices (MRO). Approximately $53 million (15.4 percent of the general fund) was allocated for health costs for F Y 2005 (Government of Guam Executive Budget, 2005).

As an unincorporated territory of the United States, Guam is eligible for Medicare, Medicaid, and other federal support for public health. As Medicaid benefits are capped at $6.98 million, the Government of Guam also has a local program of medical assistance, through its Medically Indigent Program (MIP). Guam has three federally -qualified health centers (FQHCs), Guam Community Health Centers (Northern, Central, and Southern Regions), which provide primary care services.

The demographics of Guam's Medicaid and MIP participants are shown on Table 2. There were a total of 37,104 individuals enrolled in the Medicaid and MIP programs during FY 2005, of which 36,668 were eligible participants. Of those claims that were paid for Medicaid and MIP, a total of 11,905 were from females and 8,392 from males. Total enrollment by ethnicity for Medicaid and MIP was 20,996 Chamorros, 8,417 FSM (or other Micronesians), and 5,301 Filipinos. Total expenditures for MIP and Medicaid combined in 2005 were $28.9 million (Guam DPHSS, Bureau of Health Care Financing, 2005).

Table 2
Demographics of Medicaid and MIP Participants (2005)

		Medicaid	MIP	Total
Enrollment		26,758	10,346	37,104
Eligible Participants		26,511	10,157	36,668
Gender *	*Females*	9,049	2,856	11,905
	Males	6,717	1,675	8,392
Ethnicity **	*Chamorro*	18,066	2,930	20,996
	FSM	4,065	4,352	8,417
	Filipino	2,964	2,337	5,301

*Based on Paid Claims **Based on Enrollment
Source: Guam Department of Health and Human Services, Bureau of Health Care Financing, 2005.

Other public medical assistance to the aged, blind, and disabled totaled $18.9 million in 2005, which averaged a total cost of $1196.71 per patient. Of the total medical claims, 8.32% was used for *Old Age Assistance*, 36.89% went to *AFDC Adults* 52.05% went to *AFDC Children* and

2.73% was used for *Aid to the Permanently Disabled*. A small portion, $47.80, was used for *Aid to the Blind.*

Guam participates in the federally supported program, State Children Health Insurance Program (SCHIP). The Guam CHIP is an expansion of the MAP that provides medical and health related services to qualified children less than 19 years of age. It is a 65:35 federal-local funded program, which received approximately $1.2 million from the federal funds and $623,337 from local funds in FY 2005. The current cap on CHIP is $1.48 million.

The Government of Guam provides health insurance coverage for qualified active employees, retirees, and survivors. The open enrollment data for FY 2005 and FY 2006 is reported on Table 3. There were four health plans offered in FY 2005 with an enrollment of 16,041 including active employees, retirees, and survivors. In FY 2006, there were six health plans offered with an enrollment of 16,634. The new plans, offered by Select Care, included Health Savings Account option with a $1500 deductible, and a plan with a $1000 and health care services from the Philippines.

The Government of Guam-Employee share for health insurance for FY 2006 was 59% to 41%, which are approximately $24.6 million from Government of Guam and $16.8 million from employees for a total premium annual cost of $41.4 million. Guam's private health system includes primary care clinics, medical specialists and technologists, and other allied health services such as dental medicine, chiropractic, mental health and counseling services, optometry, home health nursing and rehabilitation services, and pharmacies.

Table 3

Government of Guam Health Insurance Enrollment (FY 2005 and FY 2006)

Health Plan	Active Employees		Retirees – Survivors	
	FY 2005	FY 2006	FY 2005	FY 2006
Staywell Silver	797	560	1513	924
Staywell Bronze	3194	2644	2016	1978
Staywell Bronze (High)	5812	5686	1135	1641
Select Care 1500	896	326	677	210
Select Care HSA 1500	N/A	1560	N/A	399
Select Care PHL 1000	N/A	585	N/A	121

Source: Department of Administration, Government of Guam 2006.

Seven private health insurance companies provided coverage on Guam during CY 2003 and CY 2004. The insurance companies that provided accident, life, and health coverage during this time period were American Family Life Assurance Co., Netcare Life and Health Insurance Co.,

PacificCare Health Insurance Co. of Micronesia, Prudential Insurance Co. of America, United Healthcare Insurance Co., Nichido Insurance Co., and Zurich Insurance, Inc. Company premiums and direct losses are summarized on Table 4. Direct premiums written for all seven companies were approximately $160 million for CY 2003 and $174 million for CY 2004. Direct losses paid for all seven insurance companies were approximately $128 million in CY 2003 and $142 million in CY 2004. Low to middle -income families are most affected, yet there appears to be evidence of more affluent families seeking public health services for

Table 4

Guam Insurance Companies Premiums and Losses (CY 2003 and CY 2004)

	CY 2003	CY2004
Direct Premiums Written	$160,271,434	$173,799,581
Direct Premiums Earned	$158,372,536	$173,795,552
Direct Premiums Paid	$128,314,599	$142,289,332
Direct Losses Incurred	$131,719,419	$137,523,128

Source: Department of Revenue and Taxation, Government of Guam, 2006

HEALTH POLICY PROFILE

Compared with private health care, government-provided health services are viewed as a safety net for those not part of employment-sponsored health programs. With rising rates of unemployment, increases in the numbers of people employed in part-time work, and reductions to health care benefits provided by employers, the concept of a government safety net is changing. For many citizens, government-provided health service is becoming the mainstay of health security either through direct service or through legislative and other advocacy efforts aimed at affordability.

Those uninsured at the time of the HIES study had the following reasons for not having coverage: Couldn't afford the premium (26.9 percent), lost or changed job (6.8 percent), no employer coverage (6.0 percent), spouse or parent lost job or died (3.2 percent), problems with eligibility (3.2 percent), and other, uncategorized reasons (21.3 percent). Those w ho were currently insured but had been uninsured at some point during the past 12 months reported similar reasons for not having coverage.

Given Guam's prolonged recession and structural changes to its employment base, Guam's middle-class is finding it more difficult to pay for health insurance coverage. As a result, the

government's role in providing health services is emerging as the provider of choice for more families.

In this market condition, Guam's policy makers should anticipate an increase in demand for services to be paid for and provided by public health programs. Calls for government action may become more vocal as more middle class families, particularly those employed by the Government of Guam, find themselves with limited coverage or limited options in choice of health insurance providers. One response is to intervene in private markets with legislation. The other is to allow markets to adapt and adjust.

If government acts in ways to distort the market, it contributes to longer-term problems that are often more pervasive than a market imbalance in the supply of health services at affordable costs. An appropriate policy action is often for government to do nothing, yet this is often difficult, especially in emotionally charged debates, such as health care.

Demand for public health services will likely increase. Part of this increase comes from the newly implemented network of care for public health management between the CHCs and the hospital. Other demand comes from growing support as part of the Compact of Free Association agreements with neighboring islands. In all the Government of Guam may find itself being the insurer of last resort for those who have lost health benefits, as well as for those who never had them.

EXPANDING COVERAGE

A Health Survey Supplement, conducted as part of HIES, revealed reasons given by those not having coverage as: could not afford the premium (26.9 percent), lost or changed job (6.8 percent), no employer coverage (6.0 percent), spouse or parent lost job or died (3.2 percent), problems with eligibility (3.2 percent), and other uncategorized reasons (21.3 percent).

Issues of access and affordability appear to be two major reasons for Guam's uninsured. These findings were also prominent in the Health Summit which brought together informed industry leaders, government agency directors, and policy makers. This group identified an additional issue of prevention as an important third element to be part of the health plan for Guam's uninsured. While the Health Survey Supplement respondents did not explicitly identify prevention as a reason for their status as uninsured, it is indirectly identified with problems of eligibility. Estimating preventive care cost models need further or special attention in the design of Guam's health plan as well as assessing individual incentives for changes in lifestyle to realize associated longer-term health gains.

TOWARD IMPLEMENTATION

Implementation of Guam's health plan to expand insurance coverage begins with some evidence that Guam's economy is rebounding from its prolonged recession. From an economic perspective, there are five critical issues that shape Guam's implementation strategy:

Guam's economy is rebounding with an expectation for improved government revenues, increased number of businesses, and improved prosperity from Guam's private sector, including households.

1. No change in the relative distribution of small businesses is expected and Guam's health plan will need to address access to health insurance for these firms, their workers and families.
2. The number of non-US citizens living and working on Guam will likely increase with demand for workers to improve the island's physical infrastructure in advance of military relocation. Increased numbers of uninsured are projected.
3. Demand for public health services likely will increase unless Guam's health plan provides incentives to make private medical care affordable and attractive to both health consumers and providers.
4. Guam's geographic proximity to international markets and related price competition for health care may constrain island resources, erode its private market share, and contribute to increased health system costs.

With the background and guidance of this study, staging implementation of a universal health begins with a sense of local trends and will build upon a need to capture additional information, evaluate progress and make incremental policy changes at a time when Guam's economy is expected to grow significantly. Much of the current condition of Guam's health system may be the result of a severe and prolonged economic recession. The numbers of uninsured may change with an improved economy and effective policy actions to improve the health system.

The outlook for policy action and support for continued monitoring appears strongly positive. Similarly community awareness and engagement created by this study makes certain that the issue of the uninsured will not fade without it being addressed.

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ENDNOTES

[1] The 2002 Guam Economic Census reports 2,926 total business establishments on Guam with 2,757 businesses reporting fewer than 50 employees. The largest category of firms, those with four or fewer workers, numbered 1,326.

[2] Census 2000 provides information on Guam's population and housing and reports a population of 154,805. Demographic and other data are used for projections of health demand given the relation ship between income and health status).

[3] Data as of 2003 reported by Guam Bureau of Labor Statistics. US Census 2000 reports Guam's median household income as $39,317.

[4] Data from 2000 US Bureau of Census and Guam Household Income and Expense Survey 2005.

[5] Data from Guam 2000 Census, US Census Bureau. Data are reported for full -time, year-round wage earners.

[6] Issues of health benefits coverage for employees of the Government of Guam will be addressed in a later section of this report, Policy Profile.

[7] The Health Status Survey was conducted for all persons within the household and for al l major disease categories except cancer.

[8] Military personnel and their dependents are not included in the population totals. Health services for active duty military are provided by a Naval Hospital and military clinics located on Guam and are not included in this review. Veterans receive care from local health

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