Economic Growth, Trade, and Multinational Presence in Vietnam's Provinces

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Abstract

This paper examines the relationships between the growth of per capita GDP, on the one hand, and trade and multinational corporation (MNC) presence on the other, in a large number of Vietnam's provinces for 1995-2003. Both descriptive statistics and regressions which assume no simultaneity among growth, trade, and MNC presence suggest that MNC presence is positively and significantly correlated with per capita growth. Moreover, the inclusion of MNC presence as explanatory variable suggests convergence of per capita growth among Vietnam's provinces that is not observed when this variable is excluded. On the other hand, both descriptive statistics and these regressions indicated that correlations between trade or export ratios and per capita growth were weak and never significant statistically. Although remarkably consistent over a wide variety of possible specifications, these results must be treated with caution because attempts to deal with potential simultaneity among per capita growth, trade or export ratios, and MNC presence suggest no significant correlations among these variables and were not able to explain provincial growth very well. Numerous potentially severe measurement errors in the Vietnamese provincial data also mandate caution when interpreting the results.

Keywords: growth, trade, exports, multinational corporations, Vietnam, province
JEL Categories: F14, F23, F43, O11, O47, O53

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1. Introduction

After the introduction of market reforms in the mid- to late-1980s, Vietnam's economy performed extremely well, with real per capita GDP increasing over 5 percent annually in 1992-1997 and again in 2000-2005 (Figure 1). As a result, real per capita GDP increased 2.2-fold in 1992-2005 (Ramstetter 2006), and although Vietnam is still a relatively poor economy, these increases in per capita GDP have been a major cause of improved living standards and reduced poverty. The economy has also undergone important structural changes. Large increases in international trade and the activities of foreign-owned multinational corporations (MNCs) in Vietnam are two of the most conspicuous structural changes, and the relationships between these changes and the growth of per capita GDP are the focus of this study.

The ratio of merchandise trade (exports plus imports) to nominal GDP was only 15 percent as late as 1988, but it increased markedly to 66 percent in 1995 and 133 percent in 2005 (Figure 1). Although imports exceeded exports by an average of about 7.5 percent of GDP in 1986-2005, trends in the ratios of trade to GDP and exports to GDP have been similar. Foreign direct investment (FDI) in affiliates of foreign MNCs was virtually non-existent through 1988, but it subsequently increased to annual averages of US$493 million in 1989-1995 and US$1.6 billion in 1996-2004 (Ramstetter 2006). MNCs produced 6.3 percent of Vietnam's nominal GDP in 1995 and this share increased to 15 percent in 2004.[1] MNCs also accounted for disproportionately large shares of merchandise trade, which also increased rapidly from 27 percent of exports and 18 percent of imports in 1995 to 55 percent of exports and 35 percent of imports in 2004 (Vietnam, General Statistics Office, various years a, various years b). In short, rapid economic growth has been accompanied by even more rapid

[1] In real terms (1994 prices), this increase was somewhat slower, from 6.7 percent in 1995 to 12 percent in 2004. Thus, relatively rapid inflation in MNCs was partially responsible for the increase in the nominal share. We focus on the nominal share here to be consistent with the following analysis of province level data, in which real shares are often not available.

increases in international trade and MNC production, while MNCs were responsible for a large portion of the growth in trade.

The interrelated increases of international trade and MNC presence have been pointed to as important causes of Vietnam's rapid growth in recent years (Dollar 1996; Dollar and Kraay 2004). On the other hand, it is also true that MNCs have accounted for a much smaller share of Vietnam's employment and that MNC presence has been highly concentrated in mining and manufacturing.[2] Moreover, MNCs and trade also tend to be concentrated in the major economic centers surrounding Hanoi and Ho Chi Minh City. Thus, it is not clear how widespread the benefits from trade or MNC production have been. The major purpose of this paper is thus to shed light on the relationships among economic growth, trade, and MNC activity in Vietnam's provinces.

This is not a straightforward task for several reasons. First, it is not easy to analyze the relationships among growth on the one hand, and trade or MNC presence on the other, as will be clarified in Section 2's literature review. Second, Vietnam's provincial data have a number of problems that further complicate the analyses and Section 3 highlights how data problems relate to the methodology used to analyze the effects of trade and MNC presence on growth. Section 4 then analyzes the relationships among growth, trade, and MNC presence in some detail, using both descriptive statistics and econometric estimates. Finally, section 5 summarizes the major results obtained and tasks remaining for future research.

2. Analyzing Relationships among Economic Growth, Trade, and Multinationals

In the last two decades, there has been a large increase in the literature examining how

[2] For example, MNC shares of Vietnam's employment were only 0.6 percent in 2000 and 1.5 percent in 2004 (Vietnam, General Statistics Office, various years a), while mining and manufacturing firms accounted for 88-89 percent of the turnover and 89-93 percent of the employment in foreign-owned firms which were included in enterprise surveys covering 2000 (1,058 foreign firms) to 2003 (2,007 foreign firms; Vietnam, General Statistics Office various years d).

and why economic growth, usually defined as the growth of GDP or GDP per capita over periods spanning a decade or more, varies across countries and regions.[3] In order to simplify the discussion it is convenient to divide the large number of possible growth determinants into two categories, variables explaining how technology and input levels affect growth and variables describing how policies and institutions affect growth. However, these two categories are interrelated and it is sometimes difficult to classify explanatory variables into one category unambiguously.

Many models in this literature use four core variables to describe how technology affects the variation of per capita GDP growth over long-term periods (usually defined to be a decade or more).[4] The first two determinants, the growth of population or the labor force during the period, and the average ratio of saving or fixed investment to GDP over the period, derive from a simple production function where production viewed as a function of labor and capital. The expected sign on the growth of population or labor is negative, while the expected sign on the saving or investment variable is positive, though there are a number of studies which now question whether saving or fixed investment is an important determinant of growth (Blomström, et al. 1994).

The use of a third variable, per capita GDP at the beginning of the period studied, reflects the fact that poorer economies may be able to catch up with their richer predecessors. One reason this occurs is because poorer economies can gain from previous technological advances more cheaply than richer economies are able to generate or adapt more advanced technologies. The fourth commonly used explanatory variable is some measure of human

[3] For some good recent surveys of this literature, see Barro and Sala-i-Martin (2004), and Helpman (2004).

[4] The economic literature generally defines technology very differently than more commonly cited scientific literature or the popular press. In economics, technology is generally defined as how factors of production are combined to produce output. A peculiar aspect of this definition is that the effects of transactions costs related to marketing and political governance, including economic policy making, are not explicitly accounted for.

capital intensity, which is typically a measure of skilled labor relative to the total labor input. The use of this variable also reflects the key role of technological innovation in promoting growth and how technological knowledge is often embodied in the labor force. In this paper we assume that these factors are also important determinants of the variation in economic growth across Vietnamese provinces. Other potential explanatory variables that might fall into this category measure the contributions of other factors of production (e.g., natural resources, infrastructure) or alternative aspects of technology (e.g., research and development [R&D]) but we do not use these variables to describe growth directly.[5]

In addition to these technology-related variables, cross-country or cross-region growth regressions often include a number of explanatory variables designed to capture how variation in institutional arrangements and policies affect growth. The list of explanatory variables falling into this category is particularly long but commonly used indicators attempt to capture the influences of (1) inflation or related variables, (2) public sector size or public sector deficits, (3) the quality of governance or the extent of corruption, (4) the degree of political stability, (5) openness to international trade or transactions, and (6) the size of inward FDI relative to the size of the economy. The last two of these variables are of particular interest in this study and the related literature is reviewed in detail below.

Primarily because there are a large number of potential explanatory variables, there is a large and growing literature concerned primarily with identifying the "true" specification that captures the major determinants of growth (Sala-i-Martin 1997; Temple 1999; Barro and Sala-i-Martin 2004, ch 12). However, because these variables often capture a number of interrelated influences, it seems impossible to establish clear, *a priori* criteria to select which explanatory variables should be used and in what form. Correspondingly, this literature has come to focus on various empirical techniques that identify which regressors work best with

[5] Infrastructure variables are used to explain growth, trade, and MNC presence in the first stage of instrumental variables estimates, however.

various data sets. Unfortunately, as in many studies of this topic, data limitations make it impossible to conduct such rigorous sensitivity analysis in this study (see Section 3 below). If data constraints prevent us from identifying the "true" model, our estimates below may thus be affected by specification bias and there is no way to know how severe that bias might be.

2a. International Trade and Growth across Countries

Does a greater degree of openness to international trade lead to higher growth in a region or country? This is one of the most important questions economists have asked for centuries. On the one hand, the greater division of labor facilitated by international (and domestic) trade is known to generate important static and dynamic efficiency gains, which intuition suggests should generate higher economic growth in relatively open regions. On the other hand, increased international trade often entails substantial adjustment costs and import competition can make it more difficult to develop new industries, which may be comparatively disadvantaged at their inception. Here again, intuition suggests that if these adjustment costs are large and/or industrial development is retarded as a result of import competition, growth could conceivably be lower, not higher, in economies with greater openness. Unfortunately, it is extremely difficult to reflect the intuition described above in theoretical models, partially because most common trade models are static and incapable of realistically modeling growth, while most growth models do a relatively poor job of sorting out precisely how the static and dynamic gains and losses from trade affect growth.[6]

Another fundamental problem relates to how openness is measured. Perhaps the most common measure in the literature is the ratio of trade volume, or the sum of exports and imports, to GDP (Dollar 1992, Edwards 1993). However, this measure has some obvious weaknesses primarily related to the fact that the ratio is not solely determined by openness.

[6] See Lopez (2005) for a good review of this literature.

For example, gravity models illustrate how economic size and geographical location can affect trade flows and thus openness. Correspondingly, Frenkel and Romer (1999) also create an adjusted measure of openness that removes such gravity influences in their growth regressions. Frenkel et al. (1996) use a similar framework to show that openness, or the lack of it, describes a particularly large amount of growth for Asian economies. Others such as Sachs and Warner (1995) focus on alternative measures of openness such as the black market premium, while Dollar and Kraay (2004) use the changes in trade volumes to capture the effects of changes in trade policies on growth levels. As highlighted by the surveys of Berg and Krueger (2003) and Giles and Williams (2000), as well as many of the sources cited above, a large number of studies find a positive and significant relationship between growth and openness, even after accounting for many other influences on growth.[7] Moreover, Lewer and Van den Berg (2003) argue that estimates of the size of trade's impact on growth are surprisingly consistent, suggesting that a 1 percentage point increase in export growth leads to about one-fifth percentage point increase in GDP growth.[8]

On the other hand, most measures of openness used in this literature have been criticized because they capture more than trade policy effects (Rodriguez and Rodrik 2000) or because they are thought to be correlated with other policy-related determinants of growth (Levine and Renelt 1992). Simultaneity bias is another potential problem because causation may also run from growth to openness, not just the other way around.[9] Moreover, results from studies such as Barro and Sala-i-Martin (2004, 521-541), Estrada and Yap (2006),

[7] Some other studies finding a positive relationship between trade and growth include Hallak and Levinsohn (2004), Irwin and Tervio (2002), Rigobon and Rodrik (2005), Rodriguez and Rodrik (2000), and Rodrik et al. (2002).

[8] López (2005) also emphasizes how such findings can be reconciled with microeconomic evidence indicating that exporting firms tend to be more productive than non-exporters even before exports are initiated.

[9] Lee et al (2004) use the identification through heteroscedasticity methodology to estimate the effect of openness on growth while controlling for reverse causation. Their results indicate that openness has a small positive effect on growth.

Harrison (1996), Harrison and Hanson (1999), and Levine and Renelt (1992) illustrate that it can be difficult to find a statistically significant and positive relationship between openness and growth in some data sets and specifications. In summary, the large variety of empirical results suggests that results regarding the relationship are sensitive to the specification of growth regressions, the measurement of openness, and sample selection among other factors.

2b. Foreign Multinational Corporations and Growth across Countries

The relationship between activities of foreign-based MNCs and economic growth in host economies has also come under increased scrutiny in recent years. Like international trade, investment by foreign MNCs is generally thought to lead to the efficient reallocation of resources in most cases. Moreover, MNCs are also thought to generate many of the technological advances in the world and may therefore be able to create particularly important gains in dynamic efficiency as well. Thus, larger MNC presence is generally thought to lead to higher growth. On the other hand, MNCs are known to operate primarily in imperfectly competitive markets, suggesting that larger MNC presence could be associated with relatively inefficient market structures and thereby retard growth.

The early studies of the relationship between MNC presence and economic growth focus on the effects of inward FDI by foreign MNCs in developing economies and most find a positive relationship, which was usually limited to a subset of countries. For example, Blomström, et al. (1994) find that FDI positively affects growth in higher income developing economies, but not lower income ones. Similarly, Borenstein et al. (1998) find that the positive relationship between FDI and growth is statistically significant only when the host country has a minimum threshold of human capital (i.e., when the FDI variable is interacted with a schooling variable). Balasubramanyam et al. (1996, 1999) also get a similar result, and perhaps more importantly in this context, find that FDI's positive effects are much larger in

countries which avoided import-substitution strategies. Results from larger samples including developed economies suggest other influences may also be important. For example, results from Alfaro et al. (2004) indicate that FDI induces higher growth in countries with well-developed financial systems and de Mello's (1999) study of advanced economies suggests that the impact of FDI on growth depends negatively on the technology gap between investing and host economies. Lensink and Morrissey (2001) also suggest that FDI positively affects growth, but that FDI volatility is negatively related. On the other hand, results from a more recent study by Carkovic and Levine (2005), which tests several different specifications in alternative samples, suggest that FDI does not "exert an independent influence on economic growth". Thus, as with studies of the relationship between openness and growth, estimates of the FDI-growth relationship also vary depending on specification, measurement, and sample selection.[10]

In this context, the effects of measurement errors may be particularly serious for two reasons. First, international capital flows, including FDI, are measured with notoriously large errors, which are probably much larger than corresponding errors in estimates of trade flows, for example. Second, FDI is a very poor proxy for the actual production-related activities of MNCs (as measured by sales, value added, or employment, for example). Fortunately, in sub-national studies such as this one, preferable measures of MNC presence such as the share of GDP produced by MNCs are available.

2c. Relationships among Growth, Trade, and FDI across Sub-national Regions

It is also common to examine the determinants of growth among sub-national regions instead of among independent countries. As highlighted by Barro and Sala-i-Martin (2004, ch. 11), greater factor mobility and similarities among institutions, business practices, and

[10] See de Mello (1997) for a survey of numerous older studies.

preferences among sub-national regions, have important implications for models of growth among sub-national regions. One of the important implications of these differences is that convergence is generally expected to be relatively rapid among sub-national regions. In this context, it is also important to note that policy-related barriers to trade and FDI tend to be relatively small among sub-national regions. Indeed, if these barriers were sufficiently small, one might expect variables such as openness to international trade to have relatively little explanatory power among Vietnamese regions, for example. On the other hand, both of these explanatory variables do vary greatly among regions and it is of some interest to see if this variation explains some of the variation in regional growth.

There have also been many sub-national studies of another transition economy in Asia, China, which are particularly relevant to this study. For example, in Tian et al. (2004) and Berthélemy and Démurger (2000), both FDI (different measures) and international trade (exports plus imports) are used to explain the variation in growth across Chinese provinces. Other studies such as Lin (1999), Wei (1995), and Yao (2006) focus on the relationship between growth and exports instead of growth and international trade. Many of these export studies also include analyses of the growth-FDI relationship. These studies also use other control variables, such as human capital, the size of state-owned enterprises (SOEs), and indicators of financial stability. A significant part of the Chinese growth literature focuses only on the relationship between growth and the three factors of most interest here, namely FDI, international trade, or exports.[11]

The results of most of these studies suggest that both FDI and exports are positively correlated with growth among Chinese provinces. There are a few exceptions with Jin (2004) finding that the positive relationship between the ratio of FDI to provincial GDP and growth

[11] See, for example, Chen and Fleisher (1996), Chen et al. (1995), Démurger (2001), Zhang (2001), Jin (2004), Chen and Feng (2000), Sun and Parikh (2001), and Park and Prime (1997).

was limited to coastal provinces, while estimates from Berthélemy and Démurger (2000) suggest that the impact of exports cannot be observed when both exports and FDI are introduced in their growth regressions. Tian et al. (2004) find that the coefficient on the growth rate of total trade is positive but statistically significant only at the 10 percent level. These authors and others thus suggest it is very difficult to separate the effects of FDI from those of trade, largely because MNCs account for disproportionately large shares of trade (particularly exports) as in Vietnam. Correspondingly, Berthélemy and Démurger (2000) build a model which suggests that that trade only has an indirect effect on growth with trade positively affecting FDI, which in turn directly increases growth.

In general, the Chinese studies are less sophisticated than recent international studies largely because most have apparent problems with measurement and model specification that have been eliminated from many of the recent international studies. These problems include difficulty in measuring basic variables such as GDP and trade, as well as the more generic difficulties measuring MNC presence mentioned above. Some common control variables are also not available for Chinese provinces, which limits model specification choices.

3. The Analytical Framework and Related Measurement Problems

Following the theoretical discussion in the preceding section, this paper will proceed to analyze the relationships between growth, on the one hand, and trade and MNC presence on the other, for samples of Vietnamese provinces using a rather standard growth model framework. The most basic or control models to be considered are as follows:

(1) $gYP_{95\text{-}03}$= f1(YP_{95}, $gP_{95\text{-}03}$, $IFX_{99\text{-}03}$, HK_{96})

(1') $gYP_{95\text{-}03}$= f1'(YP_{95}, $gP_{95\text{-}03}$, $IFX_{99\text{-}03}$, HK_{96}, $SOE_{95\text{-}03}$)

where

$gP_{95\text{-}03}$=growth of population, 1995-2003;

$gYP_{95\text{-}03}$=growth of real per capita GDP, 1995-2003;

HK_{96}=a measure of the human capital stock in 1996 (the first year data are available), three

alternatives are considered as follows:

$HK1_{96}$=share of skilled workers in total employment 1996;

$HK2_{96}$=share of workers with secondary education or more in total employment 1996;

$HK3_{96}$=share of workers with high school education or more in total employment 1996;

$IFX_{99\text{-}03}$=average ratio of fixed investment to GDP in current prices, 1999-2003;

$SOE_{95\text{-}03}$=the average SOE share of GDP in current prices, 1995-2003;

YP_{95}=initial level of per capita GDP (in 1995).

Equation (1) is an endogenous growth model identifying key technical determinants of growth related to input levels, human capital stocks, and the tendency for poorer regions to catch up with richer ones. Following standard endogenous growth theory and previous empirical results described in the literature review above, per capita growth is expected to be negatively correlated with the initial level of per capita GDP and population growth, but positively correlated with fixed investment and human capital. Equation (1') adds an important institutional characteristic used in several previous studies of transition economies such as China, the average SOE share of GDP, to see if the size of the SOE sector is related to regional growth in Vietnam. Economic theory often emphasizes the tendency for SOEs to have relatively weak profit motives and suggests that SOEs will be less efficient than their non-SOE counterparts. On the other hand, previous studies suggest that SOEs have actually tended to have relatively high productivity in Vietnam (Phan and Ramstetter 2004).

Some of the most fundamental problems encountered when estimating models such equations (1) or (1') for Vietnam result because data on provincial economic performance are only available for recent years, 1995-2003. This is a relatively short period in which to conduct growth analysis, which is inherently long-term in nature. On the other hand, the literature is full of examples (including some reviewed above) where shorter data spans have been used, and the use of decade-long spans is common in the panel analysis, which has proliferated in recent years. A related problem is that the fixed investment variable is only available for an even shorter period, 1999-2003. This means that period averages which

should cover 1995-2003 must be proxied with an average for a shorter, more recent period. A similar but less severe problem occurs with the human capital variables which are only available from 1996 forward.

The simplest way to examine the relationship between trade and growth is to add the ratio of total direct trade to GDP or the ratio of direct exports to GDP to equations (1) and (1') as follows:

(2) $gYP_{95\text{-}03}$= f2(YP_{95}, $gP_{95\text{-}03}$, $IFX_{99\text{-}03}$, HK_{96}, $TRD_{00\text{-}03}$)

(2') $gYP_{95\text{-}03}$= f2'(YP_{95}, $gP_{95\text{-}03}$, $IFX_{99\text{-}03}$, HK_{96}, $SOE_{95\text{-}03}$, $TRD_{00\text{-}03}$)

(3) $gYP_{95\text{-}03}$= f3(YP_{95}, $gP_{95\text{-}03}$, $IFX_{99\text{-}03}$, HK_{96}, $EXP_{00\text{-}03}$)

(3') $gYP_{95\text{-}03}$= f3'(YP_{95}, $gP_{95\text{-}03}$, $IFX_{99\text{-}03}$, HK_{96}, $SOE_{95\text{-}03}$, $EXP_{00\text{-}03}$)

where

$EXP_{00\text{-}03}$=ratio of direct exports to GDP in current prices, 2000-2003;

$TRD_{00\text{-}03}$=ratio of trade (direct exports and direct imports) to GDP in current prices, 2000-2003;

Ratios of trade or exports to GDP are expected to be positively related to per capita growth in Vietnam but the data span is extremely short in the case of trade variables, covering only 2000-2003. Moreover, import data are missing for a number of provinces which means that trade samples are smaller than export samples (55 vs. 59 provinces). Even if data were available for the entire period and all provinces, the use of these trade variables in growth models is potentially problematic. First, as indicated in the literature review, these variables are at best a proxy for the efficiency gains one would really want to measure. Second, growth can also affect trade (especially imports), creating a potential simultaneity bias, and it is perhaps more likely that rapid growth could spur more rapid increases of trade in subsequent years than in concurrent years, amplifying the potential for a simultaneity bias. Correspondingly, it is important to account for potential simultaneity between trade and growth when estimating these equations. On the other hand, the provincial ranking of trade or export ratios is not likely to have been much different in 1995-2003 than it was in 2000-2003.

In this sense, the available data are probably reasonable proxies for the entire period.

Third, the fact that the provincial data measure only direct trade, not total trade, creates another potentially important measurement problem because estimates using this definition of trade cannot account for the effects of a region's exposure to indirect trade, which can be large and may also be a major source of gains from trade. On the other hand, it can also be argued that most indirect trade is carried on by branches of trading companies, which are often headquartered and managed elsewhere, and that direct trade is thus a better measure of how a region is affected by international competition.

The simplest way to examine the relationship between MNC presence and growth is to add the MNC share of GDP to equations (1) and (1') as follows:

(4) $gYP_{95\text{-}03}$= f4(YP_{95}, $gP_{95\text{-}03}$, $IFX_{99\text{-}03}$, HK_{96}, $MNC_{95\text{-}03}$)
(4') $gYP_{95\text{-}03}$= f4'(YP_{95}, $gP_{95\text{-}03}$, $IFX_{99\text{-}03}$, HK_{96}, $SOE_{95\text{-}03}$, $MNC_{95\text{-}03}$)
where
$MNC_{95\text{-}03}$ =the average MNC share of GDP in current prices, 1995-2003;
Here the MNC share is expected to be positively correlated with per capita growth. However, here again, it is likely that MNCs will be attracted to rapidly growing regions, creating a potential simultaneity between growth and MNC presence.

The effects of trade and MNC presence are then examined together so that interactions of their effects on growth can be sorted out. This can be done by estimating the following equations:

(5) $gYP_{95\text{-}03}$= f5(YP_{95}, $gP_{95\text{-}03}$, $IFX_{99\text{-}03}$, HK_{96}, $TRD_{00\text{-}03}$, $MNC_{95\text{-}03}$)
(5') $gYP_{95\text{-}03}$= f5'(YP_{95}, $gP_{95\text{-}03}$, $IFX_{99\text{-}03}$, HK_{96}, $SOE_{95\text{-}03}$, $TRD_{00\text{-}03}$, $MNC_{95\text{-}03}$)
(6) $gYP_{95\text{-}03}$= f6(YP_{95}, $gP_{95\text{-}03}$, $IFX_{99\text{-}03}$, HK_{96}, $EXP_{00\text{-}03}$, $MNC_{95\text{-}03}$)
(6') $gYP_{95\text{-}03}$= f6'(YP_{95}, $gP_{95\text{-}03}$, $IFX_{99\text{-}03}$, HK_{96}, $SOE_{95\text{-}03}$, $EXP_{00\text{-}03}$, $MNC_{95\text{-}03}$)

As mentioned above, one might reasonably expect simultaneity to exist between the trade ratios (especially the import part of the total trade ratio) and MNC presence on the one hand and per capita growth on the other. To explore the implications of this possible simultaneity,

equations (2) through (6') are all estimated using both ordinary least squares (OLS) and instrumental variables (IV). IV estimates use all independent variables in an equation and the following two infrastructure variables as instruments:[12]

$ST1_{95}$=index of freight transport volume relative to the national average 1995;
$ST2_{95}$=index of telephone numbers relative to the national average 1995;

It should be noted that the IV estimates used in this paper are at best a partial attempt to deal with simultaneity in these equations because per capita growth might also be expected to influence population growth, the fixed investment ratio, and perhaps SOE presence. However, we were not able to successfully endogenize all of these variables at one time and focus on the implications of endogenizing the trade ratios and MNC presence in this paper.

It should also be noted that there are no provincial deflators for fixed investment, value added (GDP) of MNCs or SOEs, and exports or total trade. Because measuring the variation of ratios of these variables to GDP across provinces is paramount in this context, these ratios are calculated in nominal, not real terms here. Another alternative would be to use national deflators to account for the time-wise variation in real values of these variables relative to GDP. However, this approach is likely to distort the province-wise variation in the data set and is not used here. Rather, the use of nominal ratios is thought to be the preferable alternative in this context.

Although measuring growth and related variables in Vietnam's provinces is difficult, the Vietnamese data have two important advantages compared to similar data from other countries. Namely, it is possible to directly measure MNC and SOE presence as the ratio of value added (GDP) produced by MNCs or SOEs, respectively, to Vietnamese GDP. For MNC presence in particular, this is a far superior measure compared to often-used, FDI-based alternatives such as the FDI-GDP ratio (see Lipsey et al., 1998; Ramstetter 2000). In short,

[12] Note that the SOE share was also used as an instrument even in equations (2), (3), (4), (5), and (6), where it was excluded as an independent variable.

the contributions of MNCs and SOEs are probably measured relatively accurately in Vietnam.

4. Growth, Trade, and MNC Presence in Vietnam's Provinces

The first conspicuous characteristic revealed by Table 1 is another important measurement problem. Although the national average of real per capita GDP growth was only 5.45 percent in 1995-2003, the mean per capita growth rate for the 61 provinces for which data are available was much higher, 8.16 percent, and only three provinces reported growth which was lower than the national average for the period. Correspondingly, there are substantial adding-up errors in the real GDP series (Vietnam, General Statistics Office various years a; various years b; various years c). For 1995, the sum of provincial GDP estimates was 6.4 percent smaller than the national total but it became 2.7 percent bigger than the national total in 1999 and 14.8 percent larger in 2003. The problem appears to be concentrated in provincial GDP deflators as the sum of provincial estimates of nominal GDP was 6-11 percent smaller than the national estimate in 1995-2002 and 4.5 percent smaller in 2003. It may also be related to motives among provincial authorities to report relatively high growth to the national authorities.[13] On the other hand, generic measurement errors also seem to have been important in the provincial data, as there were similarly large adding up problems with many of the variables used in this exercise, population being the major exception.

Of the eight major regions in Vietnam, mean per capita growth was the most rapid in the relatively poor Northwest, where mean population growth was negative (Table 1). The Red River Delta including Hanoi and Haiphong and the Southeast region surrounding Ho Chi Minh were the next most rapidly growing regions. However, there was little difference in average annual per capita growth in these regions (8.4-8.6 percent) and the Central Highlands, the Mekong River Delta, or the Northeast (8.0-8.3 percent). The South Central Coast grew

[13] This has been reported to be a problem in other transition economies such as China (Movshuk 2002).

slightly slower (7.8 percent) and the North Central Coast was the slowest growing region (6.8 percent). In contrast to the relative lack of variation in mean per capita growth among regions, the Southeast had much higher trade and export ratios, as well as much larger MNC presence than other regions. The South Central Coast, Northeast, Mekong River Delta, and Central Highlands also had relatively high trade and export ratios, while the Red River Delta also had relatively large MNC presence. Other regions traded far less and had much smaller MNC presence.

Table 2 also shows that MNC presence tended to be relatively large in provinces with per capita growth of 8 percent or more, but that trade ratios were lower in the nine provinces which grew 10 percent or more than in provinces growing 8.0-9.9 percent or 6.9 percent or less (Table 2). Correspondingly, the simple correlation coefficient between per capita growth and MNC presence (0.25) was among the largest observed in this data set and this correlation was markedly stronger than corresponding correlations with total trade ratio (0.14) or the export ratio (0.10, Table 3). Likewise there was a weak tendency for growth to be higher in groups of provinces with relatively large MNC presence. On the other hand, growth was relatively high in groups of provinces with very high or very low trade or export ratios, and lower in groups with moderate ratios. The descriptive statistics in Tables 2 and 3 thus suggest that there was a relatively strong correlation between per capita growth and MNC presence at the provincial level, but that correlations with the trade or export ratios and growth were not as strong.

Provinces with per capita growth of 10 percent or more also had relatively high initial per capita GDP and low population growth rates, while provinces that grew 8 percent or more had a relatively large SOE presence (Table 2). The simple correlation between per capita growth and population growth was negative as expected and the strongest of all simple correlations with per capita growth (Table 3). The correlation with SOE presence was also

relatively strong, slightly smaller than the correlation with MNC presence, and positive. Correlations with the fixed investment ratio were positive and about the same magnitude as the correlation with the export ratio, while correlations with human capital and infrastructure variables were negative, but tended to be relatively small in absolute value.

The simple correlations described above can be misleading, however, because they cannot provide information about how other influences on per capita growth affect relationships with trade and/or MNC presence. For example, estimates of equations (2) and (2') in Table 4 allow us to examine the correlation between the total trade ratio and growth after controlling for the influences of the basic growth determinants included in equation (1). Likewise, the estimates of equations (3) and (3') in Table 5 show the correlation between export ratios and growth in a similar manner. These regression results reinforce the impression created by the descriptive statistics above as the coefficients on the trade and export ratios are never statistically significant at the standard (5 percent) level in the 24 sets of estimates which are reported. The results are relatively comprehensive, allowing for use of 3 alternative measures of human capital, as well as both OLS and IV estimates to examine the effects of potential simultaneity between trade and growth. In other words, the correlation between trade or export ratios and growth still appears very weak in Vietnam's provinces after trying several alternative ways of controlling for other determinants of growth.

Several qualifications are important in this context, however. First, the only explanatory variable that is a consistently significant determinant of per capita growth is population growth, while coefficients on other explanatory variables are rarely significant at standard levels. Second, the coefficient on the SOE share was positive and significant when human capital was defined as *HK1* and weakly significant at the 10 percent level in other estimates of equation (2'). Positive coefficients on this variable may be surprising if one supposes the SOE sector is relatively inefficient, but is not surprising in light of evidence that

SOEs tended to have relatively high productivity in Vietnam through the early 21st century (Phan and Ramstetter 2004). Third, the coefficient on initial GDP per capita was weakly significant at the 10 percent level in estimates of equation (3') when human capital was defined as *HK1*, However, this coefficient was positive, suggesting a lack of convergence among Vietnamese provinces. This specification also yields a negative and significant or weakly significant coefficient on the human capital variable, contrary to expectations that human capital should be positively correlated with growth. However, the failure to observe similar results in other specifications makes it difficult to attach much meaning to this unexpected result. A somewhat more typical result is the insignificance of the coefficient on the fixed investment variable in all specifications.[14]

Fourth, it should be noted that attempts to account with simultaneity did not explain per capita growth very well when estimating these equations and defining human capital as *HK2* or *HK3*. The poor fit of many of the IV estimates suggests that these instruments did not do a very good job of explaining the variation in trade or export ratios and per capita growth. Another potential problem is that these IV estimates failed to adequately account for simultaneity between growth and other independent variables such as the fixed investment ratio and the growth of population. Unfortunately, we have no way of knowing how severe the simultaneity-related inconsistency is in either the original OLS estimates or in the IV estimates.

When equations (4) and (4') are estimated by OLS (assuming no simultaneity between growth and MNC presence), higher MNC presence is positively and significantly correlated with growth in all specifications (Table 6). This result is markedly weaker when

[14] It is also interesting to note that similar results are obtained when equation (1) is estimated without trade or MNC presence variables (see Appendix Table 2). Results of estimating equation (1) also suggest that differences among the total sample of 61 provinces, the export sample of 59 provinces, and the trade sample of 55 provinces influence the results to some extent, but not a lot.

simultaneity is assumed and equations are estimated by instrumental variables. However, even in the IV estimates, MNC presence is positively correlated with growth at a weak significance level of 13-23 percent in almost all specifications (equation (4') when the human capital was defined as *HK1* is sole exception). This again suggests that the instruments used cannot adequately describe the variation in the endogenous variables in the system or that the simultaneity is so severe that properly accounting for it would reverse important results in the OLS estimates.

Another conspicuous difference between estimates of the MNC equations (4) and (4') on the one hand, and estimates of the trade equations (2), (2'), (3), and (3') on the other, is that the OLS results suggest a negative and significant correlation between initial GDP and growth in the MNC equations, whereas this relationship is insignificant or weakly positive in the trade equations (Tables 4, 5, 6). This result is important because it suggests that there may have been convergence among Vietnamese provinces during this period and that including the MNC variable is important to revealing the existence of that convergence. However, this result is statistically insignificant when IV estimates of the MNC equations are made and here again the chosen instruments appear to do a poor job of predicting the endogenous variables in the system. Correspondingly the extent of simultaneity-related inconsistency in the original OLS estimates remains unclear.

If one believes that both trade and MNC presence can affect growth, which we think is very likely, estimates of the trade and MNC equations in Tables 4, 5, and 6 also have a potentially severe omitted-variable bias.[15] In principle, this bias can be removed by including both the trade or export ratios and MNC presence as determinants of per capita growth as in equations (5), (5'), (6), or (6'). However, OLS estimates of these equations suggest very similar results to those already described. Namely, MNC presence is positively and

[15] This bias would also affect the estimates of equation (1) in Appendix Table 2.

significantly correlated with per capita growth in all specifications, while correlations between trade or export ratios are never statistically significant. Initial per capita GDP is also negatively and significantly correlated with per capita growth, again suggesting that the inclusion of the MNC variable reveals convergence among Vietnam's provinces that would not otherwise be observed. Population growth remains negatively and significantly correlated with growth, while correlations with the fixed investment ratio are never statistically significant. Coefficients on the human capital variables are also insignificant in estimates of equations (5) and (6), which exclude SOE presence, but when SOE presence is included in equations (5') and (6'), the negative relationship between growth and human capital becomes significant at standard levels (the trade-MNC equation (5') with human capital defined as *HK1* or *HK2*) or weakly significant at the 10 percent level (all estimates of the export-MNC equation (6')). In short, the OLS estimates of trade-MNC and export-MNC equations tell a story that is broadly consistent with the stories told by descriptive statistics and the previous regressions which include only the trade ratio, the export ratio, or MNC presence separately.

On the other hand, the IV estimates of trade-MNC and export-MNC equations explain growth much more poorly than the OLS estimates. Moreover, in the IV estimates all estimated coefficients are usually insignificant statistically. The negative coefficient on population growth when human capital is defined as *HK2* in equation (5) and *HK1* or *HK2* in equation (6) were the only correlations that were significant in these estimates. The large contrast between the OLS and IV results for these equations, combined with the fact that the IV estimates of these equations are markedly worse than IV estimates of other equations, suggests that the instruments chosen here do a particularly poor job of jointly predicting per capita growth, the trade or export ratio, and MNC presence. However, here again one cannot rule out the possibility that OLS results are affected by a particularly severe inconsistency problem related to simultaneity involving growth, trade, MNC presence, or other explanatory

variables.[16]

5. Concluding Remarks

This paper has examined the relationships between the growth of per capita GDP, on the one hand, and trade and MNC presence on the other, in a large number of Vietnam's provinces for 1995-2003. Both descriptive statistics and OLS regressions (which do not account for possible simultaneity among growth, trade, and MNC presence) suggest that MNC presence is positively and significantly correlated with per capita growth. Moreover, the inclusion of MNC presence in the OLS regressions suggests convergence of per capita growth among Vietnam's provinces that is not observed when MNC presence is excluded. On the other hand, both descriptive statistics and the OLS regressions indicated correlations between trade or export ratios and per capita growth were weak and never significant statistically. In other words, MNC presence appears to be an important determinant of per capita growth in Vietnam's provinces but trade does not. Although remarkably consistent over a wide variety of possible specifications, these results must be treated with caution, however, because attempts to deal with potential simultaneity among per capita growth, trade or export ratios, and MNC presence suggest no significant correlations among these variables and were not able to explain provincial growth very well, and because there are numerous potentially severe measurement errors in the Vietnamese provincial data.

Future research on relationships among per capita growth, trade, and MNC presence in Vietnam's provinces will have to focus first on improving the dataset used. The most

[16] Multicollinearity is another potential concern in this context because, as noted in the introduction, MNCs account for large portions of Vietnam's trade and one might therefore expect high correlations between trade or export ratios and MNC presence. However, the relatively weak correlation among these variables in Vietnam's provinces (Table 3) and the fact that OLS estimates including both trade or export ratios and MNC presence do not differ much from estimates using these variables separately suggest that multicollinearity is not a large problem in this context.

important improvement that can be made is to collect data for additional years and estimate growth models for longer periods of time. If possible, it would also be desirable to obtain revised estimates from the statistical authorities that eliminate many of the apparent errors (e.g., related to adding up) encountered in the data that have been published so far. Second, efforts to improve the instrumental variables which account for potential simultaneity must be made. In particular, it seems that the instruments used in this exercise were not able to explain variation in the endogenous variables well and efforts to identify better instruments are thus important. Third, there are some strange results regarding the role of human capital in provincial growth which should be examined further. Fourth, the use of additional variables to explain the variation of growth in Vietnamese provinces should be examined. It may be that the inclusion of an explanatory variable omitted from this study, like the inclusion of the MNC share in some of these analyses, would change fundamental and important results. One potentially important extension in this respect would be to explicitly model interregional migration and its effects on growth. Finally, the collection of additional data, as well as improving the quality of existing data, will also be helpful when addressing the last three issues mentioned above.

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Figure 1: Per Capita GDP Growth, MNC Presence, and Trade in Vietnam (percent)

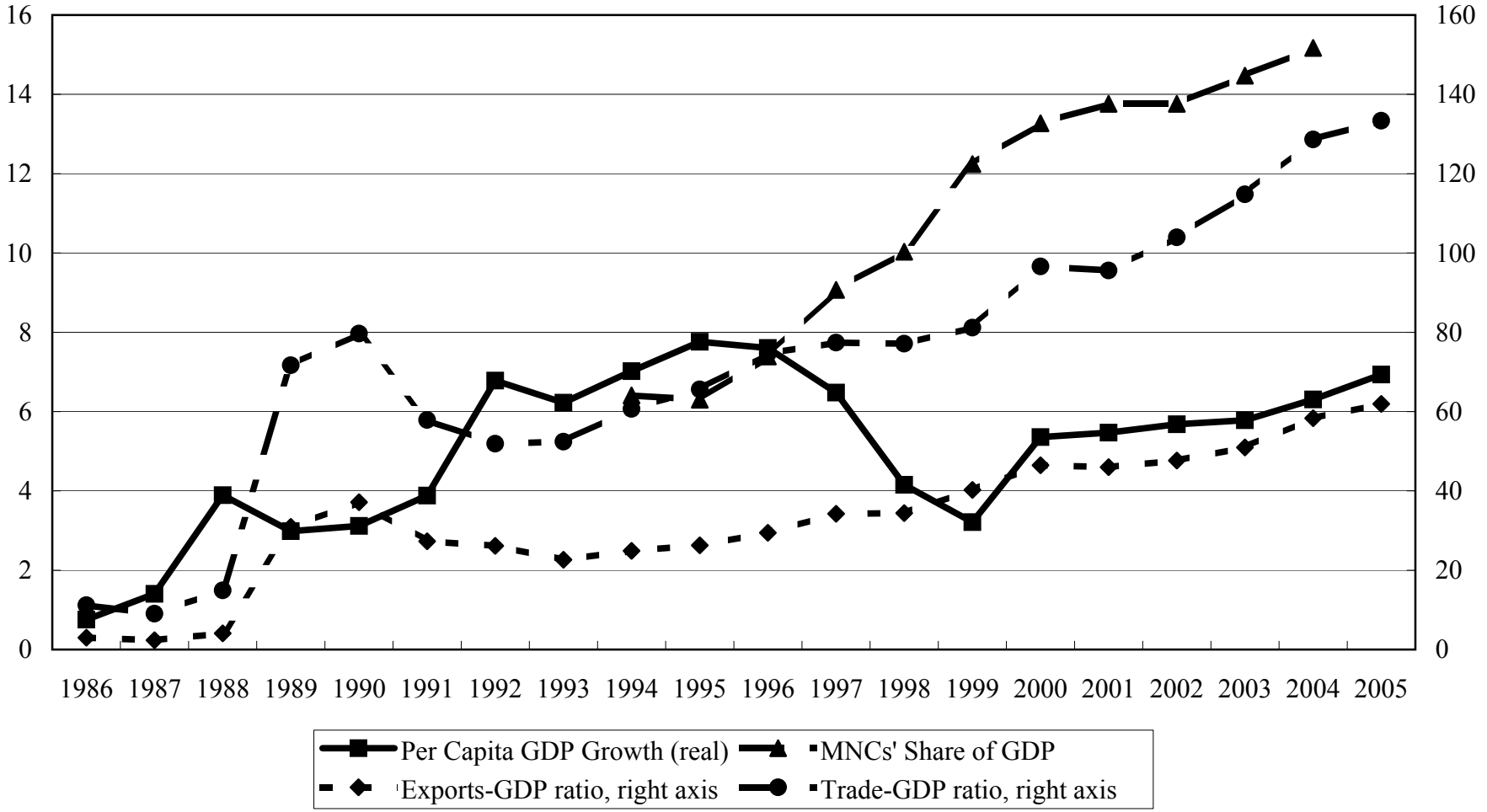

Table 1: Growth and Selected Potential Determinants for Regions and Individual Provinces with High Trade Ratios and/or MNC Shares (all variables in percent except initial GDP per capita in thousand 1994 dong)

Group (number of provinces in group), selected provinces	Growth of GDP per capita $=gYP_{95\text{-}03}$	Initial GDP per capita $=YP_{95}$	Growth of population $=gP_{95\text{-}03}$	Fixed investment -GDP ratio, nominal $=IFX_{99\text{-}03}$	Direct export-GDP ratio, nominal $=EXP_{00\text{-}03}$	Direct trade-GDP ratio, nominal $=TRD_{00\text{-}03}$	MNCs' share of GDP, nominal $=MNC_{95\text{-}03}$	SOEs' share of GDP, nominal $=SOE_{95\text{-}03}$
VIETNAM, national	5.45	2,717	1.47	34.64	48.18	104.05	11.94	39.21
Mean of available provinces	8.16	2,238	1.20	36.17	25.48	46.16	4.59	30.68
No. of available provinces	61	61	61	61	61	57	59	60
Red River Delta (11)	8.58	2,108	1.00	38.72	10.48	22.25	6.97	30.58
Hanoi	8.01	4,750	2.67	51.91	21.07	71.78	15.28	62.84
Hai Phong	8.11	3,198	1.09	52.48	35.80	51.46	13.33	48.31
Vinh Phuc	13.94	1,389	1.09	25.86	3.05	5.42	22.80	21.82
Northeast (11)	8.04	1,477	1.09	36.41	19.44	44.53	1.55	36.58
Lang Son	8.58	1,653	0.81	41.85	145.48	243.89	0.07	29.23
Northwest (3)	10.33	893	-1.14	48.92	2.84	4.39	0.25	41.09
North Central Coast (6)	6.78	1,535	1.09	30.60	8.13	16.10	2.27	31.79
South Central Coast (6)	7.75	2,056	1.42	40.64	26.89	51.94	2.64	32.47
Da Nang	9.09	3,220	2.01	44.76	60.31	145.50	7.26	57.22
Central Highlands (4)	8.26	1,735	2.91	52.92	28.46	34.88	1.11	34.68
Dac Lac	9.54	1,761	2.14	34.49	64.56	68.10	0.72	32.25
Southeast (8)	8.35	4,696	2.58	35.07	68.77	131.29	17.24	28.31
Ho Chi Minh	6.41	7,756	2.27	32.92	105.94	172.46	18.34	44.32
Binh Phuoc	5.60	1,614	4.61	15.13	50.35	57.60	0.77	30.89
Dong Nai	9.97	3,224	1.89	42.35	160.61	375.18	26.73	30.81
Vung Tau	10.07	16,150	2.81	14.32	3.98	10.32	65.76	19.76
Mekong River Delta (12)	8.10	2,365	0.51	26.12	28.51	36.07	1.96	20.76
Soc Trang	8.34	2,301	0.89	20.19	57.13	58.08	0.03	11.67
Ca Mau	7.47	2,926	1.58	25.43	62.22	62.46	0.16	19.31

Notes and Sources: See Appendix Table 1 for data and related information.

Table 2: Growth and its Potential Determinants Sorted by Per Capita Growth, Trade Ratios, and MNC Shares (initial GDP per capita in thousand 1994 dong; ST indexes have national average = 100; all other variables in percent)

Group (number of provinces in group)	$gYP_{95\text{-}03}$	YP_{95}	$gP_{95\text{-}03}$	$IFX_{99\text{-}03}$	$EXP_{00\text{-}03}$	$TRD_{00\text{-}03}$	$MNC_{95\text{-}03}$	$SOE_{95\text{-}03}$
MEANS FOR PROVINCES GROUPED BY PER CAPITA GROWTH (maximum number of provinces in parentheses)								
Growth>=10% (9)	12.30	3,160	-0.40	29.74	12.97	23.08	12.70	30.52
Growth=8.0-9.9% (17)	8.72	2,140	1.80	44.76	46.54	92.83	4.80	36.41
Growth=7.0-7.9% (17)	7.51	1,801	1.24	40.65	16.85	25.67	1.40	29.06
Growth=6.0-6.9% (14)	6.50	2,392	1.20	27.40	20.52	33.11	3.94	26.44
Growth=4.5-5.9% (4)	5.08	1,904	2.03	25.74	18.08	28.18	1.11	27.43
MEANS FOR PROVINCES GROUPED BY TRADE RATIO (maximum number of provinces in parentheses)								
Direct trade ratio>=145% (5)	8.73	3,851	2.12	48.85	129.76	258.83	13.10	37.87
Direct trade ratio=42-72% (13)	8.46	2,430	1.17	30.87	39.59	57.51	4.93	33.10
Direct trade ratio=20-30% (11)	7.82	1,729	1.49	35.63	14.52	24.59	1.91	31.88
Direct trade ratio=10-20% (16)	7.50	2,753	1.13	32.78	9.09	15.50	5.81	26.69
Direct trade ratio=0-9% (12)	8.56	1,297	0.70	42.89	3.55	5.91	2.77	29.82
MEANS FOR PROVINCES GROUPED BY EXPORT RATIO (maximum number of provinces in parentheses)								
Export ratio>=105% (4)	8.64	4,009	2.15	49.87	147.13	287.17	15.05	33.04
Export ratio=25-65% (12)	9.05	2,368	1.14	30.46	44.97	65.87	4.17	32.01
Export ratio=10-22% (17)	7.41	2,092	1.44	35.89	16.35	28.60	2.99	30.69
Export ratio=5-9% (16)	7.31	1,695	1.10	33.43	7.39	13.96	1.92	29.34
Export ratio=0-4% (12)	9.32	2,452	0.72	41.36	2.48	6.93	7.99	30.26
MEANS FOR PROVINCES GROUPED BY MNC SHARE (number of provinces in parentheses)								
MNC share>=10.0% (6)	9.42	7,768	1.97	36.64	55.08	114.44	27.04	37.98
MNC share=5.0-9.9% (10)	8.56	2,585	1.25	31.20	23.27	48.63	7.22	38.33
MNC share=1.0-4.9% (11)	8.71	2,134	0.78	33.41	16.02	23.84	2.59	27.74
MNC share=0.1-0.9% (13)	7.72	1,800	1.46	35.59	18.54	27.25	0.50	29.61
MNC share<=0.1% (19)	7.56	1,850	0.87	39.59	20.39	31.66	0.06	26.95

Table 2 (continued)

Group (number of provinces in group)	*HK1* $_{96}$	*HK2* $_{96}$	*HK3* $_{96}$	*ST1* $_{95}$	*ST2* $_{95}$
MEANS FOR PROVINCES GROUPED BY GROWTH RATE (maximum number of provinces in parentheses)					
Growth>=10% (10)	8.25	40.24	11.55	55.79	50.82
Growth=8.0-9.9% (16)	12.36	42.28	13.02	149.36	129.75
Growth=7.0-7.9% (18)	9.90	41.59	11.58	77.78	58.82
Growth=6.0-6.9% (13)	9.98	39.73	11.90	113.19	162.49
Growth=4.5-5.9% (4)	12.69	49.29	11.48	37.96	40.50
MEANS FOR PROVINCES GROUPED BY DIRECT TRADE SHARE OF GDP (maximum number of provinces in parentheses)					
Direct trade share>=50% (15)	14.79	37.26	14.58	129.61	366.88
Direct trade share=20-49% (14)	12.53	37.35	12.77	196.28	155.96
Direct trade share=10-20% (16)	10.43	31.81	10.34	94.21	72.27
Direct trade share=5-9% (8)	9.70	50.28	12.68	75.61	55.95
Direct trade share=0-4% (4)	8.17	42.26	10.65	38.52	31.81
MEANS FOR PROVINCES GROUPED BY DIRECT EXPORT SHARE OF GDP (maximum number of provinces in parentheses)					
Export share>=50% (9)	15.42	37.56	14.98	110.26	423.86
Export share=20-49% (12)	10.67	31.37	10.09	199.31	83.49
Export share=10-20% (13)	11.45	36.18	12.05	106.17	132.92
Export share=5-9% (15)	9.49	56.24	13.66	72.03	46.56
Export share=0-4% (12)	8.92	41.65	10.87	25.83	33.17
MEANS FOR PROVINCES GROUPED BY MNC SHARE (number of provinces in parentheses)					
MNC share>=10.0% (6)	18.85	56.66	22.56	327.06	492.89
MNC share=5.0-9.9% (10)	11.42	50.19	14.90	137.01	81.06
MNC share=1.0-4.9% (11)	9.45	39.75	10.98	100.98	78.10
MNC share=0.1-0.9% (13)	10.18	40.13	11.00	57.19	45.16
MNC share<=0.1% (19)	8.47	36.51	8.99	45.34	39.76

Notes and Sources: See Appendix Table 1 for data and related information.

Table 3: Correlations Coefficients among Per Capita Growth and Potential Independent Variables

Variables	$gYP_{95\text{-}03}$	YP_{95}	$gP_{95\text{-}03}$	$IFX_{99\text{-}03}$	$EXP_{00\text{-}03}$	$TRD_{00\text{-}03}$	$MNC_{95\text{-}03}$	$SOE_{95\text{-}03}$	$HK1_{96}$	$HK2_{96}$	$HK3_{96}$	$ST1_{95}$	$ST2_{95}$
$gYP_{95\text{-}03}$	1.0000	0.0278	-0.4635	0.1037	0.0972	0.1377	0.2495	0.2328	-0.1171	-0.0641	-0.0096	-0.0264	-0.0822
YP_{95}		1.0000	0.2445	-0.1894	0.1947	0.1884	0.8737	0.0081	0.3650	-0.0132	0.2710	0.2032	0.4126
$gP_{95\text{-}03}$			1.0000	0.0147	0.2130	0.2015	0.1769	-0.2081	0.2478	0.0426	0.1533	0.0138	0.1447
$IFX_{99\text{-}03}$				1.0000	0.1826	0.2509	-0.1838	0.2837	0.0773	-0.0184	-0.0089	0.0435	0.0585
$EXP_{00\text{-}03}$					1.0000	0.9656	0.1876	0.0419	0.2201	-0.1946	0.0161	0.0912	0.2658
$TRD_{00\text{-}03}$						1.0000	0.2656	0.1139	0.2765	-0.0957	0.1170	0.0672	0.2623
$MNC_{99\text{-}03}$							1.0000	0.0612	0.3032	0.1292	0.3713	0.1907	0.2788
$SOE_{99\text{-}03}$								1.0000	0.5844	0.2430	0.4691	0.3851	0.3503
$HK1_{96}$									1.0000	0.4256	0.7980	0.5432	0.7364
$HK2_{96}$										1.0000	0.8017	0.2673	0.1610
$HK3_{96}$											1.0000	0.4925	0.5879
$ST1_{95}$												1.0000	0.3526
$ST2_{95}$													1.0000

Notes and Sources: See Appendix Table 1 for data and related information.

Table 4: Regression Results for Equations (2) and (2'): Dependent Variable = $gYP_{95\text{-}03}$

Variables	Equation (2), OLS		Equation (2'), OLS		Equation (2), IV		Equation (2'), IV	
	Coeffii-cient	p-value	Coeffii-cient	p-value	Coeffii-cient	p-value	Coeffii-cient	p-value
HK_{96}=$HK1_{96}$								
Constant	8.3145	0.00	7.7562	0.00	8.2891	0.00	7.6709	0.00
YP_{95}	0.0002	0.23	0.0002	0.11	0.0002	0.24	0.0002	0.13
$gP_{95\text{-}03}$	-0.7250	0.00	-0.5469	0.00	-0.7178	0.00	-0.5221	0.01
$IFX_{99\text{-}03}$	0.0081	0.67	-0.0089	0.64	0.0092	0.64	-0.0069	0.75
$HK1_{96}$	-0.0195	0.73	-0.1378	0.06	-0.0029	0.97	-0.1003	0.34
$SOE_{95\text{-}03}$	-	-	0.0694	0.02	-	-	0.0719	0.02
$TRD_{00\text{-}03}$	0.0048	0.26	0.0045	0.26	-0.0009	0.97	-0.0098	0.71
F-Statistic	4.60	0.00	5.28	0.00	4.18	0.00	4.01	0.00
Adj. R^2	0.25	-	0.32	-	0.22	-	0.17	-
HK_{96}=$HK2_{96}$								
Constant	8.2628	0.00	7.8475	0.00	8.3458	0.00	8.1668	0.00
YP_{95}	0.0001	0.25	0.0001	0.34	0.0002	0.25	0.0002	0.23
$gP_{95\text{-}03}$	-0.7326	0.00	-0.6586	0.00	-0.7224	0.00	-0.5172	0.04
$IFX_{99\text{-}03}$	0.0073	0.70	-0.0048	0.81	0.0084	0.66	-0.0062	0.82
$HK2_{96}$	-0.0017	0.90	-0.0089	0.51	-0.0024	0.85	-0.0208	0.32
$SOE_{95\text{-}03}$	-	-	0.0382	0.10	-	-	0.0695	0.09
$TRD_{00\text{-}03}$	0.0044	0.29	0.0030	0.47	0.0010	0.94	-0.0255	0.29
F-Statistic	4.57	0.00	4.43	0.00	4.28	0.00	2.35	0.05
Adj. R^2	0.25	-	0.28	-	0.24	-	-0.02	-
HK_{96}=$HK3_{96}$								
Constant	8.0837	0.00	7.7007	0.00	8.1233	0.00	7.6119	0.00
YP_{95}	0.0001	0.29	0.0001	0.27	0.0002	0.23	0.0003	0.20
$gP_{95\text{-}03}$	-0.7385	0.00	-0.6439	0.00	-0.7154	0.00	-0.5343	0.03
$IFX_{99\text{-}03}$	0.0072	0.70	-0.0055	0.78	0.0102	0.62	-0.0041	0.88
$HK3_{96}$	0.0118	0.79	-0.0360	0.48	0.0234	0.63	-0.0292	0.68
$SOE_{95\text{-}03}$	-	-	0.0434	0.10	-	-	0.0654	0.10
$TRD_{00\text{-}03}$	0.0043	0.30	0.0034	0.40	-0.0057	0.72	-0.0237	0.31
F-Statistic	4.58	0.00	4.44	0.00	3.92	0.01	2.42	0.04
Adj. R^2	0.25	-	0.28	-	0.17	-	-0.01	-

Note: IV estimates use all independent variables listed except $TRD_{00\text{-}03}$ and two infrastructure variables ($ST1_{95}$ and $ST2_{95}$) as instruments in all regressions; there were 55 observations in all regressions.

Table 5: Regression Results for Equations (3) and (3'): Dependent Variable = $gYP_{95\text{-}03}$

Variables	Equation (3), OLS		Equation (3'), OLS		Equation (3), IV		Equation (3'), IV	
	Coeffii-cient	p-value	Coeffii-cient	p-value	Coeffii-cient	p-value	Coeffii-cient	p-value
HK_{96}=$HK1_{96}$								
Constant	8.5178	0.00	8.0032	0.00	8.5991	0.00	8.0686	0.00
YP_{95}	0.0002	0.18	0.0002	0.10	0.0002	0.18	0.0002	0.10
$gP_{95\text{-}03}$	-0.7125	0.00	-0.5515	0.00	-0.7017	0.00	-0.5435	0.00
$IFX_{99\text{-}03}$	0.0102	0.59	-0.0042	0.83	0.0098	0.61	-0.0045	0.82
$HK1_{96}$	-0.0449	0.42	-0.1537	0.04	-0.0364	0.57	-0.1467	0.07
$SOE_{95\text{-}03}$	-	-	0.0622	0.04	-	-	0.0620	0.03
$EXP_{00\text{-}03}$	0.0078	0.34	0.0080	0.32	-0.0008	0.98	0.0012	0.97
F-Statistic	4.30	0.00	4.58	0.00	4.03	0.00	4.36	0.00
Adj. R^2	0.22	-	0.27	-	0.21	-	0.26	-
HK_{96}=$HK2_{96}$								
Constant	8.3404	0.00	8.0792	0.00	8.9240	0.00	9.0170	0.00
YP_{95}	0.0001	0.26	0.0001	0.33	0.0002	0.19	0.0002	0.22
$gP_{95\text{-}03}$	-0.7318	0.00	-0.6853	0.00	-0.6908	0.00	-0.5713	0.01
$IFX_{99\text{-}03}$	0.0081	0.67	0.0005	0.98	0.0079	0.69	-0.0057	0.82
$HK2_{96}$	-0.0022	0.87	-0.0066	0.63	-0.0083	0.59	-0.0216	0.28
$SOE_{95\text{-}03}$	-	-	0.0240	0.30	-	-	0.0418	0.18
$EXP_{00\text{-}03}$	0.0066	0.43	0.0052	0.54	-0.0137	0.60	-0.0352	0.30
F-Statistic	4.13	0.00	3.62	0.00	3.65	0.01	2.64	0.03
Adj. R^2	0.21	-	0.21	-	0.13	-	0.02	-
HK_{96}=$HK3_{96}$								
Constant	8.1408	0.00	7.9189	0.00	8.5851	0.00	8.4022	0.00
YP_{95}	0.0001	0.30	0.0001	0.30	0.0002	0.19	0.0002	0.17
$gP_{95\text{-}03}$	-0.7385	0.00	-0.6838	0.00	-0.6907	0.00	-0.5848	0.01
$IFX_{99\text{-}03}$	0.0080	0.68	0.0008	0.97	0.0079	0.70	-0.0037	0.88
$HK3_{96}$	0.0108	0.81	-0.0163	0.76	0.0079	0.87	-0.0366	0.56
$SOE_{95\text{-}03}$	-	-	0.0250	0.34	-	-	0.0399	0.22
$EXP_{00\text{-}03}$	0.0069	0.40	0.0059	0.48	-0.0193	0.42	-0.0310	0.26
F-Statistic	4.13	0.00	3.59	0.01	3.46	0.01	2.73	0.02
Adj. R^2	0.21	-	0.21	-	0.09	-	0.03	-

Note: IV estimates use all independent variables listed except $EXP_{00\text{-}03}$ and two infrastructure variables ($ST1_{95}$ and $ST2_{95}$) as instruments in all regressions; there were 59 observations in all regressions.

Table 6: Regression Results for Equations (4) and (4'): Dependent Variable = $gYP_{95\text{-}03}$

Variables	Equation (4), OLS		Equation (4'), OLS		Equation (4), IV		Equation (4'), IV	
	Coeffii-cient	p-value	Coeffii-cient	p-value	Coeffii-cient	p-value	Coeffii-cient	p-value
HK_{96}=$HK1_{96}$								
Constant	9.5907	0.00	9.1466	0.00	9.6299	0.00	7.9740	0.00
YP_{95}	-0.0006	0.01	-0.0006	0.02	-0.0007	0.36	0.0003	0.76
$gP_{95\text{-}03}$	-0.6695	0.00	-0.5502	0.00	-0.6682	0.00	-0.5412	0.00
$IFX_{99\text{-}03}$	0.0049	0.77	-0.0057	0.74	0.0047	0.78	-0.0045	0.83
$HK1_{96}$	-0.0303	0.53	-0.1125	0.09	-0.0301	0.53	-0.1487	0.09
$SOE_{95\text{-}03}$	-	-	0.0468	0.07	-	-	0.0634	0.08
$MNC_{95\text{-}03}$	0.1986	0.00	0.1870	0.00	0.2064	0.23	-0.0187	0.94
F-Statistic	9.37	0.00	8.70	0.00	5.80	0.00	4.12	0.00
Adj. R^2	0.42	-	0.44	-	0.42	-	0.22	-
HK_{96}=$HK2_{96}$								
Constant	10.3515	0.00	10.0203	0.00	10.3958	0.00	10.0758	0.00
YP_{95}	-0.0008	0.00	-0.0008	0.00	-0.0008	0.25	-0.0008	0.22
$gP_{95\text{-}03}$	-0.6651	0.00	-0.6169	0.00	-0.6638	0.00	-0.6152	0.00
$IFX_{99\text{-}03}$	0.0025	0.88	-0.0059	0.73	0.0023	0.89	-0.0061	0.73
$HK2_{96}$	-0.0194	0.09	-0.0238	0.04	-0.0198	0.20	-0.0242	0.12
$SOE_{95\text{-}03}$	-	-	0.0265	0.17	-	-	0.0265	0.16
$MNC_{95\text{-}03}$	0.2226	0.00	0.2227	0.00	0.2280	0.16	0.2295	0.15
F-Statistic	10.37	0.00	9.12	0.00	6.10	0.00	5.50	0.00
Adj. R^2	0.45	-	0.46	-	0.45	-	0.46	-
HK_{96}=$HK3_{96}$								
Constant	9.8423	0.00	9.5435	0.00	9.2038	0.00	9.1076	0.00
YP_{95}	-0.0007	0.00	-0.0007	0.00	-0.0004	0.42	-0.0005	0.27
$gP_{95\text{-}03}$	-0.6665	0.00	-0.5869	0.00	-0.6904	0.00	-0.6097	0.00
$IFX_{99\text{-}03}$	0.0041	0.80	-0.0066	0.70	0.0056	0.74	-0.0047	0.79
$HK3_{96}$	-0.0402	0.31	-0.0814	0.08	-0.0199	0.67	-0.0640	0.23
$SOE_{95\text{-}03}$	-	-	0.0366	0.10	-	-	0.0340	0.13
$MNC_{95\text{-}03}$	0.2131	0.00	0.2200	0.00	0.1272	0.23	0.1581	0.13
F-Statistic	9.61	0.00	8.75	0.00	5.44	0.00	5.20	0.00
Adj. R^2	0.43	-	0.45	-	0.40	-	0.43	-

Note: IV estimates use all independent variables listed except $MNC_{95\text{-}03}$ and two infrastructure variables ($ST1_{95}$ and $ST2_{95}$) as instruments in all regressions; there were 59 observations in all regressions.

Table 7: Regression Results for Equations (5) and (5'): Dependent Variable = $gYP_{95\text{-}03}$

Variables	Equation (5), OLS		Equation (5'), OLS		Equation (5), IV		Equation (5'), IV	
	Coeffii-cient	p-value	Coeffii-cient	p-value	Coeffii-cient	p-value	Coeffii-cient	p-value
$HK_{96}=HK1_{96}$								
Constant	9.3378	0.00	8.8272	0.00	12.1613	0.03	13.2451	0.70
YP_{95}	-0.0007	0.00	-0.0006	0.01	-0.0029	0.45	-0.0036	0.88
$gP_{95\text{-}03}$	-0.6870	0.00	-0.5509	0.00	-0.6930	0.17	-0.7366	0.62
$IFX_{99\text{-}03}$	0.0039	0.81	-0.0091	0.58	-0.0209	0.76	-0.0241	0.86
$HK1_{96}$	-0.0040	0.93	-0.0975	0.12	-0.1917	0.59	-0.2123	0.79
$SOE_{95\text{-}03}$	-	-	0.0541	0.03	-	-	-0.0182	0.97
$TRD_{00\text{-}03}$	0.0009	0.81	0.0010	0.79	0.0683	0.55	0.0872	0.89
$MNC_{95\text{-}03}$	0.1997	0.00	0.1850	0.00	0.6829	0.41	0.8465	0.87
F-Statistic	8.55	0.00	8.66	0.00	0.49	0.81	0.25	0.97
Adj. R^2	0.46	-	0.50	-	0.11	-	0.06	-
$HK_{96}=HK2_{96}$								
Constant	10.1259	0.00	9.7052	0.00	12.5187	0.00	21.1212	0.88
YP_{95}	-0.0007	0.00	-0.0008	0.00	-0.0026	0.25	-0.0082	0.93
$gP_{95\text{-}03}$	-0.6699	0.00	-0.5894	0.00	-0.6780	0.04	-1.0090	0.85
$IFX_{99\text{-}03}$	0.0029	0.85	-0.0102	0.53	-0.0179	0.68	-0.0400	0.92
$HK2_{96}$	-0.0165	0.14	-0.0244	0.03	-0.0344	0.35	-0.0600	0.89
$SOE_{95\text{-}03}$	-	-	0.0411	0.03	-	-	-0.1418	0.95
$TRD_{00\text{-}03}$	0.0001	0.99	-0.0015	0.67	0.0335	0.37	0.1516	0.94
$MNC_{95\text{-}03}$	0.2192	0.00	0.2223	0.00	0.6180	0.22	1.8379	0.92
F-Statistic	9.32	0.00	9.38	0.00	1.18	0.33	0.07	1.00
Adj. R^2	0.48	-	0.52	-	0.23	-	0.04	-
$HK_{96}=HK3_{96}$								
Constant	9.6333	0.00	9.2403	0.00	12.9151	0.08	11.5614	0.25
YP_{95}	-0.0007	0.00	-0.0007	0.00	-0.0030	0.50	-0.0021	0.72
$gP_{95\text{-}03}$	-0.6757	0.00	-0.5577	0.00	-0.7220	0.18	-0.6641	0.20
$IFX_{99\text{-}03}$	0.0041	0.80	-0.0116	0.48	-0.0280	0.74	-0.0229	0.73
$HK3_{96}$	-0.0297	0.44	-0.0898	0.04	-0.2239	0.55	-0.1786	0.65
$SOE_{95\text{-}03}$	-	-	0.0527	0.02	-	-	0.0203	0.88
$TRD_{00\text{-}03}$	0.0009	0.79	-0.0003	0.93	0.0766	0.54	0.0505	0.79
$MNC_{95\text{-}03}$	0.2087	0.00	0.2185	0.00	0.6953	0.47	0.5219	0.69
F-Statistic	8.76	0.00	9.23	0.00	0.42	0.86	0.77	0.62
Adj. R^2	0.46	-	0.52	-	0.09	-	0.13	-

Note: IV estimates use all independent variables listed except $TRD_{00\text{-}03}$, $MNC_{95\text{-}03}$, and two infrastructure variables ($ST1_{95}$ and $ST2_{95}$) as instruments in all regressions; there were 55 observations in all regressions.

Table 8: Regression Results for Equations (6) and (6'): Dependent Variable = $gYP_{95\text{-}03}$

Variables	Equation (6), OLS		Equation (6'), OLS		Equation (6), IV		Equation (6'), IV	
	Coeffii-cient	p-value	Coeffii-cient	p-value	Coeffii-cient	p-value	Coeffii-cient	p-value
$HK_{96}=HK1_{96}$								
Constant	9.5234	0.00	9.0731	0.00	10.9236	0.00	7.5935	0.07
YP_{95}	-0.0006	0.01	-0.0006	0.02	-0.0025	0.40	0.0007	0.86
$gP_{95\text{-}03}$	-0.6772	0.00	-0.5572	0.00	-0.7008	0.03	-0.5225	0.07
$IFX_{99\text{-}03}$	0.0053	0.75	-0.0054	0.75	-0.0013	0.97	-0.0045	0.85
$HK1_{96}$	-0.0362	0.46	-0.1192	0.07	-0.0954	0.49	-0.1511	0.16
$SOE_{95\text{-}03}$	-	-	0.0471	0.07	-	-	0.0702	0.38
$EXP_{00\text{-}03}$	0.0058	0.42	0.0060	0.39	0.0797	0.46	-0.0125	0.92
$MNC_{95\text{-}03}$	0.1961	0.00	0.1844	0.00	0.6134	0.36	-0.1067	0.91
F-Statistic	7.87	0.00	7.53	0.00	1.06	0.40	2.45	0.03
Adj. R^2	0.42	-	0.44	-	0.19	-	-0.01	-
$HK_{96}=HK2_{96}$								
Constant	10.2629	0.00	9.9916	0.00	11.6147	0.00	8.1176	0.35
YP_{95}	-0.0008	0.00	-0.0008	0.00	-0.0022	0.37	0.0010	0.89
$gP_{95\text{-}03}$	-0.6706	0.00	-0.6198	0.00	-0.6821	0.01	-0.5415	0.21
$IFX_{99\text{-}03}$	0.0026	0.87	-0.0057	0.74	-0.0048	0.87	-0.0051	0.89
$HK2_{96}$	-0.0185	0.11	-0.0233	0.06	-0.0272	0.34	-0.0187	0.64
$SOE_{95\text{-}03}$	-	-	0.0261	0.18	-	-	0.0533	0.65
$EXP_{00\text{-}03}$	0.0025	0.72	0.0010	0.89	0.0460	0.51	-0.0617	0.81
$MNC_{95\text{-}03}$	0.2206	0.00	0.2219	0.00	0.5383	0.32	-0.1851	0.91
F-Statistic	8.52	0.00	7.68	0.00	1.83	0.11	1.04	0.41
Adj. R^2	0.44	-	0.45	-	0.27	-	-0.14	-
$HK_{96}=HK3_{96}$								
Constant	9.7455	0.00	9.4884	0.00	12.1433	0.18	6.0373	0.80
YP_{95}	-0.0007	0.00	-0.0007	0.00	-0.0034	0.70	0.0026	0.91
$gP_{95\text{-}03}$	-0.6757	0.00	-0.5963	0.00	-0.7324	0.13	-0.5091	0.59
$IFX_{99\text{-}03}$	0.0042	0.80	-0.0061	0.72	-0.0063	0.92	0.0001	1.00
$HK3_{96}$	-0.0391	0.33	-0.0791	0.09	-0.1677	0.71	0.0553	0.95
$SOE_{95\text{-}03}$	-	-	0.0352	0.12	-	-	0.0583	0.77
$EXP_{00\text{-}03}$	0.0047	0.50	0.0033	0.64	0.1285	0.73	-0.1312	0.90
$MNC_{95\text{-}03}$	0.2109	0.00	0.2183	0.00	0.8154	0.68	-0.5225	0.92
F-Statistic	8.00	0.00	7.42	0.00	0.46	0.83	0.32	0.94
Adj. R^2	0.42	-	0.44	-	0.12	-	-0.11	-

Note: IV estimates use all independent variables listed except $EXP_{00\text{-}03}$, $MNC_{95\text{-}03}$, and two infrastructure variables ($ST1_{95}$ and $ST2_{95}$) as instruments in all regressions; there were 59 observations in all regressions.

Appendix Table 1: Estimates of Economic Growth, Trade, MNC Presence and Related Variables by Province

Province	$gYP_{95\text{-}03}$	YP_{95}	$gP_{95\text{-}03}$	$IFX_{99\text{-}03}$	$EXP_{00\text{-}03}$	$TRD_{00\text{-}03}$	$MNC_{95\text{-}03}$	$SOE_{95\text{-}03}$	$HK1_{96}$	$HK2_{96}$	$HK3_{96}$	$ST1_{95}$	$ST2_{95}$
National Estimates	5.450	2,716	1.469	29.893	NA	NA	11.932	39.213	NA	NA	NA	NA	NA
Whole country, prov.	5.446	2,717	1.469	34.640	48.185	104.054	11.939	39.232	11.000	45.860	13.779	100.0	100.0
Hanoi	8.008	4,750	2.667	51.907	21.066	71.778	15.276	62.844	34.349	78.072	37.518	323.4	1,128.3
Hai Phong	8.107	3,198	1.091	52.482	35.804	51.456	13.326	48.311	20.325	71.222	23.684	1,137.3	149.2
Vinh Phuc	13.935	1,389	1.087	25.855	3.050	5.418	22.800	21.822	6.786	68.879	19.283	24.2	14.6
Ha Tay	6.886	1,755	0.949	30.831	2.488	6.149	6.440	19.972	11.131	60.874	14.690	79.5	83.4
Bac Ninh	11.446	1,578	0.805	32.323	6.634	18.475	4.348	25.678	8.088	62.275	13.278	18.4	31.8
Hai Duong	9.277	2,008	0.609	45.343	7.249	11.035	5.650	39.457	7.233	79.529	16.168	110.1	78.1
Hung Yen	10.834	1,646	0.928	33.486	5.845	NA	8.404	18.809	5.521	74.628	17.716	70.5	20.2
Ha Nam	7.497	1,644	0.814	39.084	11.498	17.270	0.210	26.876	12.700	67.083	13.796	28.8	15.7
Nam Dinh	6.179	1,761	0.765	28.775	8.686	16.051	0.060	25.569	13.918	69.122	17.314	88.3	65.6
Thai Binh	4.525	2,082	0.551	29.382	9.070	18.056	0.153	17.387	12.090	77.184	13.786	76.3	57.2
Ninh Binh	7.720	1,374	0.719	56.443	3.926	6.801	0.007	29.665	10.987	67.800	13.010	33.5	22.2
Ha Giang	8.206	946	2.066	60.422	2.045	4.260	0.000	29.179	7.179	20.396	4.333	5.3	17.6
Cao Bang	11.645	1,171	0.348	19.252	3.018	22.803	0.600	32.850	10.021	36.264	11.258	7.9	16.2
Lao Cai	7.367	1,265	0.160	58.501	11.802	22.446	0.482	38.978	9.134	26.567	8.676	3.9	121.1
Bac Can	8.097	1,091	1.735	40.058	2.183	6.367	0.000	23.444	7.921	38.475	9.285	1.6	3.5
Lang Son	8.583	1,653	0.807	41.847	145.477	243.887	0.070	29.234	9.451	37.079	9.590	10.2	36.3
Tuyen Quang	8.029	1,372	1.319	49.158	0.171	NA	0.000	33.262	12.646	56.843	13.692	17.0	18.3
Yen Bai	7.466	1,382	1.208	26.624	2.588	2.869	0.000	36.027	6.886	41.848	10.689	23.4	24.4
Thai Nguyen	5.230	1,936	0.972	21.934	5.604	NA	3.193	40.643	14.214	57.570	13.973	34.2	50.7
Phu Tho	7.805	1,540	0.909	43.808	22.455	54.226	7.145	42.474	11.580	68.556	19.813	33.9	45.7
Bac Giang	6.318	1,311	0.980	24.782	7.068	17.102	0.102	23.554	6.690	57.138	10.510	37.8	45.3
Quang Ninh	9.687	2,583	1.437	14.146	11.470	26.828	5.413	72.736	24.060	62.221	22.623	393.4	114.2
Lai Chau	13.680	582	-6.699	62.021	0.506	0.926	0.183	66.085	5.401	15.810	3.662	4.9	17.3
Son La	8.547	873	2.058	53.417	1.584	2.803	0.003	25.994	8.080	24.103	6.447	22.5	22.3
Hoa Binh	8.753	1,224	1.230	31.329	6.427	9.447	0.550	31.179	7.861	44.642	10.869	11.4	21.6
Thanh Hoa	6.839	1,625	1.021	33.212	6.377	9.547	2.892	28.630	8.440	63.504	16.342	203.4	57.7
Nghe An	7.243	1,639	1.160	45.987	6.148	14.130	1.049	35.220	11.221	70.793	17.754	234.9	121.0
Ha Tinh	7.063	1,537	0.358	19.720	8.202	13.251	0.458	31.578	9.681	72.067	18.124	69.6	32.4
Quang Binh	6.955	1,303	1.161	31.320	5.731	16.391	0.263	33.412	11.376	64.118	18.400	71.9	31.2
Quang Tri	6.533	1,482	1.625	29.432	10.664	21.179	0.124	28.611	9.850	44.685	12.003	37.6	40.8
Hue	6.044	1,625	1.227	23.930	11.676	22.093	8.808	33.272	10.966	32.368	12.554	36.9	76.1
Da Nang	9.085	3,220	2.007	44.757	60.306	145.502	7.264	57.216	12.232	36.083	12.970	207.0	138.9
Quang Nam	7.169	1,581	1.064	37.252	8.746	17.527	1.333	25.031	9.870	33.587	9.376	31.4	39.9
Quang Ngai	7.589	1,341	1.062	57.974	4.192	7.502	0.074	25.018	7.374	32.174	9.601	31.8	67.2

Appendix Table 1 (continued)

Province	$gYP_{95\text{-}03}$	YP_{95}	$gP_{95\text{-}03}$	$IFX_{99\text{-}03}$	$EXP_{00\text{-}03}$	$TRD_{00\text{-}03}$	$MNC_{95\text{-}03}$	$SOE_{95\text{-}03}$	$HK1_{96}$	$HK2_{96}$	$HK3_{96}$	$ST1_{95}$	$ST2_{95}$
Binh Dinh	7.184	1,713	1.169	39.825	29.606	48.748	0.282	22.990	10.381	30.309	8.385	169.8	83.4
Phu Yen	7.946	1,359	1.542	46.439	13.354	27.863	0.752	29.422	8.860	25.205	7.585	112.5	38.1
Khanh Hoa	7.532	3,122	1.685	17.597	45.136	64.472	6.137	35.141	13.218	38.157	15.188	175.4	106.8
Kon Tum	7.561	1,737	3.121	73.688	9.440	14.542	0.000	43.163	10.304	26.054	9.452	33.5	16.9
Gia Lai	8.109	1,364	2.971	62.612	18.338	27.511	0.871	39.093	8.838	23.338	6.452	56.4	44.4
Dac Lac	9.543	1,761	2.142	34.490	64.557	68.104	0.722	32.251	10.744	43.779	12.291	87.9	78.4
Lam Dong	7.836	2,079	3.414	40.907	21.492	29.373	2.846	24.223	11.945	40.085	12.860	89.6	116.0
Ho Chi Minh	6.411	7,756	2.274	32.916	105.942	172.463	18.338	44.315	25.912	46.414	24.999	338.8	1,431.2
Ninh Thuan	4.967	1,984	1.989	36.533	7.295	8.873	0.342	20.796	9.945	28.644	9.581	20.7	30.0
Binh Phuoc	5.605	1,614	4.609	15.130	50.352	57.599	0.769	30.894	14.511	33.749	8.594	20.7	24.1
Tay Ninh	11.833	2,031	1.401	22.870	25.198	42.804	7.832	27.543	9.110	25.674	9.376	75.2	70.3
Binh Duong	9.610	3,402	3.648	82.371	176.485	357.141	NA	27.789	13.239	27.648	9.948	11.9	85.2
Dong Nai	9.972	3,224	1.889	42.352	160.608	375.180	26.729	30.809	13.096	39.096	15.389	80.2	142.8
Binh Thuan	8.319	1,406	2.059	34.078	20.335	25.923	0.925	24.559	7.713	22.883	6.632	27.8	73.0
Vung Tau	10.072	16,150	2.811	14.324	3.984	10.318	65.755	19.762	12.616	36.304	14.470	58.4	91.2
Long An	6.651	2,633	1.349	35.202	40.861	64.570	9.080	36.631	9.141	23.830	7.853	188.1	76.9
Dong Thap	6.270	2,227	1.105	9.881	22.936	42.569	0.000	17.996	7.236	17.385	6.563	79.8	67.4
An Giang	6.165	2,461	1.079	27.491	18.727	22.470	0.062	10.274	5.731	13.488	4.440	168.7	108.6
Tien Giang	7.535	2,270	0.609	33.384	14.731	18.934	2.693	14.193	9.429	22.866	9.236	116.4	74.2
Vinh Long	6.326	2,225	0.565	35.125	18.817	21.977	0.164	16.662	7.637	22.842	8.670	101.7	46.4
Ben Tre	7.700	2,114	0.536	28.417	10.866	13.907	0.186	14.660	8.262	25.941	9.034	81.9	50.5
Kien Giang	6.895	3,167	1.808	30.920	17.647	19.901	4.829	24.787	6.303	21.407	6.400	112.1	99.0
Can Tho	15.640	1,777	-5.416	32.512	37.377	60.794	3.323	42.215	10.723	23.514	9.012	172.3	118.8
Tra Vinh	6.571	2,160	0.878	9.842	9.698	11.058	NA	NA	5.350	19.025	5.842	40.0	45.2
Soc Trang	8.336	2,301	0.887	20.185	57.128	58.084	0.029	11.674	5.212	13.329	3.439	35.7	53.6
Bac Lieu	11.614	2,118	1.125	25.009	31.143	NA	1.091	19.913	6.008	18.801	5.933	70.2	76.9
Ca Mau	7.470	2,926	1.582	25.429	62.224	62.464	0.155	19.311	6.410	17.959	4.324	52.0	24.5

Sources and Notes:

Vietnam, General Statistics Office (various years a; various years b; various years c) for all variables except *HK1* , *HK2* , and *HK3* .

Real GDP for Binh Duong in 1995 estimated assuming the ratio of this province to the total was the same as 1996.

For several years in the sample, estimates of *IFX* , *EXP, TRD, MNC,* and *SOE* were extrapolated based on data for surrounding years. For example, if shares in later years were zero or very small, they were assumed to be zero or very small for previous years. In addition, when one year was missing in the middle of a series, that observation was estimated using a linear extrapolation of values for the surrounding years.

Vietnam, General Statistics Office (2004) for *HK1* , *HK2* , and *HK3* .

1997 values were used as proxies for 1996 for 9 provinces each when estimating *HK1* , *HK2* , and *HK3* .

Appendix Table 2: Regression Results for Control Equations (1) and (1'):
Dependent Variable = $gYP_{95\text{-}03}$

Variables	Full sample (1)		Trade sample		Trade sample		Export sample		Export sample	
	Coeffii-cient	p-value	Coeffii-cient	p-value	Coeffii-cient	p-value	Coeffii-cient	p-value	Coeffii-cient	p-value
HK_{96}=$HK1_{96}$, OLS estimates										
Constant	8.0524	0.00	8.2930	0.00	7.7293	0.00	8.5918	0.00	8.0803	0.00
YP_{95}	0.0002	0.11	0.0002	0.19	0.0002	0.09	0.0002	0.15	0.0002	0.08
$gP_{95\text{-}03}$	-0.6674	0.00	-0.7189	0.00	-0.5391	0.00	-0.7027	0.00	-0.5421	0.00
$IFX_{99\text{-}03}$	0.0222	0.19	0.0090	0.63	-0.0083	0.67	0.0098	0.61	-0.0046	0.82
$HK1_{96}$	-0.0354	0.52	-0.0055	0.92	-0.1260	0.08	-0.0371	0.50	-0.1454	0.05
$SOE_{95\text{-}03}$	-	-	-	-	0.0702	0.02	-	-	0.0619	0.04
F-Statistic	4.97	0.00	5.39	0.00	6.04	0.00	5.15	0.00	5.30	0.01
Adj. R^2	0.21	-	0.25	-	0.32	-	0.22	-	0.27	-
Observ.	61	-	55	-	55	-	59	-	59	-
HK_{96}=$HK2_{96}$, OLS estimates										
Constant	7.9988	0.00	8.3690	0.00	7.8813	0.00	8.5294	0.00	8.1994	0.00
YP_{95}	0.0002	0.15	0.0002	0.17	0.0001	0.28	0.0002	0.20	0.0001	0.28
$gP_{95\text{-}03}$	-0.6825	0.00	-0.7196	0.00	-0.6437	0.00	-0.7185	0.00	-0.6707	0.00
$IFX_{99\text{-}03}$	0.0204	0.22	0.0087	0.64	-0.0049	0.80	0.0081	0.67	-0.0003	0.99
$HK2_{96}$	-0.0040	0.75	-0.0027	0.84	-0.0101	0.44	-0.0042	0.74	-0.0085	0.52
$SOE_{95\text{-}03}$	-	-	-	-	0.0415	0.07	-	-	0.0263	0.25
F-Statistic	4.86	0.00	5.40	0.00	5.26	0.00	5.03	0.00	4.32	0.00
Adj. R^2	0.20	-	0.25	-	0.28	-	0.22	-	0.22	-
Observ.	61	-	55	-	55	-	59	-	59	-
HK_{96}=$HK3_{96}$, OLS estimates										
Constant	7.7488	0.00	8.1008	0.00	7.6894	0.00	8.2576	0.00	7.9960	0.00
YP_{95}	0.0002	0.17	0.0002	0.22	0.0002	0.21	0.0002	0.24	0.0002	0.24
$gP_{95\text{-}03}$	-0.6878	0.00	-0.7285	0.00	-0.6300	0.00	-0.7259	0.00	-0.6680	0.00
$IFX_{99\text{-}03}$	0.0204	0.23	0.0085	0.65	-0.0054	0.79	0.0079	0.68	0.0001	1.00
$HK3_{96}$	0.0083	0.85	0.0168	0.70	-0.0352	0.49	0.0101	0.82	-0.0195	0.71
$SOE_{95\text{-}03}$	-	-	-	-	0.0461	0.08	-	-	0.0273	0.29
F-Statistic	4.84	0.00	5.44	0.00	5.22	0.00	5.01	0.00	4.25	0.00
Adj. R^2	0.20	-	0.25	-	0.28	-	0.22	-	0.22	-
Observ.	61	-	55	-	55	-	59	-	59	-