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Vietnam Growth Accounting: 1989-2004

Introduction

This research paper aims to investigate and analyze the economic growth and fluctuation pertaining to output, capital, labor, and total factor productivity (TFP). Using data from Vietnam in 1989 to 2003 and growth accounting techniques, we hope to determine relative effects of major events, such as the adoption of a new constitution and the Asian Financial Crisis, on the nation's economic development

As one of Asia's fastest-developing countries, Vietnam went through the transition from a centrally planned economy to a market economy, and later galloped on the path from a poor economy to a prosperous one. The word "Vietnamese" used to be invariably related to what the press called "boat people," disheveled refugees from Saigon after the fall of this capital city, flocking to the shores of their neighbor countries, who became the defining image of this nation. Throughout the early 1980s, Vietnam faced persistent food shortages, worsening inflation and severe trade deficits.

Starting in 1986, the Vietnamese government undertook a series of reforms, dubbed the Doi Moi (renovation) policy, aimed at radically reforming the structure of the Vietnamese economy. Pursuing the Washington consensus, the government legalized private economic activity, eliminated exchange rate controls, aligned itself with numerous free-trade agreements – in short, it turned itself overnight into a proper player on the world market.

The results were stark. GDP growth reached 9.54 percent at its peak during the 1990s. Vietnamese literacy rates grew steadily. With these results, Vietnam became a sensation among free-market circles, who fashioned it with flashy labels like the "Asian tiger cub." Since 1990s, Vietnam has attained an unprecedentedly high GDP growth rate accompanied by a remarkable speed of lowering its inflation.

With growth came enormous structural change. In 1986, Vietnam's workforce was 34 percent agricultural, mostly rice farmers. Virtually all of these farmers were employed in state-owned rice farms that, in the old Soviet tradition, were horrendously underproductive. State-owned enterprises also dominated in the manufacturing sector, facing virtually no competition. By 2009, only 17 percent of the workforce was employed in agriculture. Manufacturing share fell sharply in 1989-1990 as the state-owned factories shut down, then rebounded to 25 percent much later in 2009. The labor force expanded by an average of 2.4 percent yearly as more and more Vietnamese were brought into the formal sector. Vietnam signed a preferential trade agreement with the European Economic Community in 1992, and was brought into the Association of Southeast Asian Nations in 1995. The resulting boom in exports and inflow of foreign investment served as a major fuel source for Vietnam's meteoric rise.

Methodology

All of our growth accounting data was taken from the World Bank. We decompose growth according to the Solow growth model, which uses the Cobb-Douglas production function as the basis for analysis:

$$Y = AK^{\alpha}(hL)^{1-\alpha}$$

Y represents gross domestic product, K represents value of capital, h represents human development (proxied by average years of education), L represents level of employment, and α represents relative share of income to capital.

$$\log Y = \log A + \alpha \log K + (1-\alpha)\log h + (1-\alpha)\log L$$

Taking a log of both sides and taking the subsequent difference between periods, we end up with an equations that provides a relationship between relative growth rates of each category:

$$\Delta \log Y = \Delta \log A + \alpha \Delta \log K + (1-\alpha) \Delta \log h + (1-\alpha) \Delta \log L$$

$$g_A = g_Y - \alpha g_K - (1-\alpha) g_h - (1-\alpha) g_L$$

A, or the implied level of total factor productivity, is normally an unobservable quantity, generalized as "the way things are done," a means of efficiency that goes beyond just investment in physical capital, human capital, or labor mobilization. It signifies the structural change, whether in a particular industry or a nation's broader culture, which is the "je ne sais quoi" of economic development that elevates it above simple growth.

Growth accounting for Vietnam: 1989-2004

In our model, the depreciation rate of capital is 0.04, suggested by the Penn World Table 9.0. Our estimation of the share of capital productivity, 0.33, comes from a growth accounting paper from the Federal Reserve Bank of Atlanta.

Based on the data that we gathered for capital stock, GDP, human capital and labor supply, we calculated the total factor productivity for Vietnam's economy during the 1989 to 2003. One notable point from the result is the consistent growth rate of human capital, ranging from 2.49 to 3.66 percent. This persistent human capital growth rate suggests a growing proficiency and literacy of Vietnamese workers. In addition to human capital, another attention grabbing result is about the high growth rate in capital stock. Over the 15-year period, Vietnam experienced high yearly capital stock growth, ranging from 10.08 percent to 21.05 percent.

However, when we calculated total factor productivity in Vietnam using the methods previously outlined, we found that it actually decreased slightly from year to year. It appeared that the rampant capital mobilization, though it did contribute to spectacular GDP growth during the 1990s, was masking the fact that innovation during the period was stagnant. The story borne out by the data is a confusing one, one that portrays dizzying growth and enthusiastic investment in a country whose value-generating ideas, it seemed, were severely lacking.

Doi Moi Policy

The primary source of development in the late-80s was a conscious political move to restructure the means of economic production. The Vietnamese economy was floundering under a Soviet-style system of large, state-owned enterprises, which produced 29 percent of all output, and employed 16 percent of the entire labor force, including half of all non-agricultural labor. Large private enterprise had been outlawed, which gave the inefficient SOEs a monopoly to boot. The vast majority of private employment during the period was in small, unregistered household businesses, which tended to be low-growth and inefficient.

Protectionism in the pre-Doi Moi period took on all the classic forms. An overvalued Vietnamese Dong and heavy duties stifled any possible export activity. Imports were subject to a system of quotas, and any business looking to import was forced to navigate a labyrinth of government licenses. With no trade agreements with its neighbors and an embargo by the United States that had been in place since the Vietnam War, Vietnam's problems were left to fester within its sealed borders.

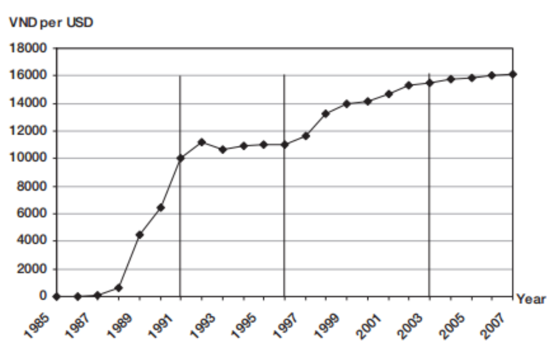
Even more crippling was the government-placed control on the price of rice – at its lowest, rice could only be sold for one-tenth of its international market value. This artificial price ceiling put serious strain on rice farmers, a huge portion of the Vietnamese economy – in 1992, 70 percent of all Vietnamese households and 72 percent of all cultivable land were dedicated to rice. Constriction on the rice market, combined with the isolationism that was common for LDCs of the period, meant that rice producers struggled to make any profit whatsoever. With no chance to sell to the international market, stiffed by the policies of their own country, rice farmers were stuck.

Reforms: outward

By 1989, the price controls on rice had already been lifted, and some of the earliest Doi Moi policies were being put into practice. Chief among them was outward-orientation. Previously, there had been a complicated system of multiple fixed ERs: an official rate for foreign trade transactions, another for non-commercial transactions, a so-called internal settlement rate for the purpose of compensating export enterprises for their losses, and a separate rate for remittances received from overseas. This system, aside from being difficult to navigate, was another mechanism by which the government discouraged imports – an overvalued Dong specifically for commercial transactions was designed as a stumbling block for trade.

In 1989, the Vietnamese government undertook a series of reforms to devalue and simplify its exchange rate. Gone were the arbitrary exceptions for this sector or that activity – having a single uniform exchange rate greatly increased the ease of doing business for both export-oriented firms within Vietnam and outsiders looking to sell, or perhaps to even invest. It also eliminated the potential distortionary effects that selective regulation tends to have.

FIGURE 2
Nominal VND/USD Rate, 1985–2007



NOTE: Period average rate.
SOURCE: The IMF's International Financial Statistics (Online).

Adapted from McCaig and Pavcnik, "Moving out of Agriculture: Structural Change in Vietnam."

In conjunction with exchange rate reform, Vietnam also eliminated its fiscal subsidies for export industries. While subsidies can be in principle a driver for growth, helping nascent companies achieve the economies of scale they need in order to be competitive, more often in the context of highly dirigiste economies they attract rent-seeking, special interests and favoritism that divert energy away from real work. It does not help that, even today, Vietnam is ranked among the most corrupt nations in the world. Doing away with these subsidies allows for a more even playing field for companies, and served as a signal of faith in free markets.

As the years wore on and the effects of central government meddling fell away, the agriculture-manufacturing ratio of exports grew to mirror the agriculture-manufacturing production ratio of the entire economy. With additional reforms in the domestic economy, the market was allowed to sort out the optimal production path for the nation at large – taking the export sector along with it.

Reforms: inward

Vietnam was one of the foremost practitioners of the agriculture-led development model that propelled many of its East Asian neighbors to successful development. The government was able to recognize that the nation's massive rice-farming population, rather than being a signal of backwardness, was a vital asset for the prosperity of the people at large.

After price controls were lifted and farmers were allowed to compete against state collectives, the Vietnamese government took up the cause of land reform. A 1993 law allowed for land to come under proper, Western-style private ownership, with all the rights that entailed. It could be transferred, rented, mortgaged and titled. This flexibility afforded farmers a lot more freedom to use their land as they wished, another step away from the oppressive institutions of the Communists. It also constituted the first steps towards a developed finance system that was accessible to ordinary citizens, whereby farmers were allowed to mortgage their land for a cash that could be put towards personal expenses or capital improvements. The emergence of this kind of financial flexibility is one of the traditional hallmarks of an increasingly dynamic economy.

Indeed, dynamism in individual finance was complemented by dynamism in demographics, as the Doi Moi precipitated a massive reallocation of labor across different sectors. Rice production, the staple of the Vietnamese economy, is highly labor intensive, so allowing for the free movement of labor allows that ever-important input to allocate itself efficiently. Incidentally, this dense, newly mobile and increasingly well-educated population is to this day the source of Vietnam’s comparative advantage – not only in the production of rice, but also in labor-intensive manufacturing.

One major demographic allocation was the move from state-owned enterprises to private farms, which tended to be much more productive. From 1989-2009, SOE employment in non-service industries dropped from 30 percent of the total labor force to 16 percent. Farmers, presented newly with the opportunity to participate in the global rice market and compete against the inefficient state-owned collectives, seized it en masse.

The transition from agriculture to manufacturing was a touch more complicated. Because of the previous government’s obsession with modernity, state-owned manufacturing had been a significant part of the economic makeup of Vietnam leading into the reforms, making up 17 percent of the economy. However, with the opening of markets in the 1989s, these plants, which were plagued by inefficiencies, were forced to shut down. The end result is that at the onset of the 1990s, development had caused the share of manufacturing in the economy to drop sharply, as labor shifted toward rice, the much more productive sector.

As time wore on, particularly during the 2000s, manufacturing was able to attract more and more foreign capital, increasing manufacturing employment and setting Vietnamese development on a more traditional path. During the 2000s, manufacturing growth averaged around 7.5 percent yearly, and in 2003 manufacturing employment surpassed agricultural. Corresponding to this compositional change was a major internal migration. Southeast Vietnam, the center of Vietnam's burgeoning manufacturing sector, saw its proportion of the nation's labor force grow from 15.7 percent to 19 percent throughout the Doi Moi period.

Another growing component of the economy during this period was crude oil. From 79 million USD in 1988 to one billion USD in 1995, liberalization of the capital market allowed petroleum exports to grow enormously. But natural resources can often be a curse in developing countries, sucking up resources from other sectors or precipitating massive inflation in a phenomenon known as "Dutch disease". Vietnam managed to avoid these trappings because petroleum never really dominated the export market to the degree that it dominated in nations like Liberia or Nigeria. Right alongside the growth in petroleum exports was growth in rice, garments, footwear and tree crops like coffee. Never committed wholly to one specialty, the Vietnamese export sector thrived on its ability to move on – as soon as its share in the world market hit the point at which it could no longer increase its sales, it found another sector to grow. Diversification was key in the robustness of Vietnamese economic growth. Additionally, it helped the economy weather the crisis that was yet to come.

East Asian Financial Crisis

The first major hurdle to Vietnam's economic integration came was the East Asian Financial crisis, which hit the country harshly in July 1997. For the most part, this crisis resulted in a substantial tightening of foreign direct investment, which had been a crucial factor in the

Vietnamese growth story. FDI accounted for 27.2 percent of total investment in the period of 1991-97. If large inflows of FDI had not followed the Doi Moi reforms, the GDP growth rate in 1995 would have been 5.2 rather than 9.5 percent. With a low domestic savings rate, the impressive scale of capital mobilization in Vietnam was dependent on FDI – hence the sharp drop in capital growth in 1997 as investors grew cold to the region.

Year	Growth in GDP	Growth in capital stock
1995	9.34%	19.64%
1996	8.15%	17.61%
1997	5.76%	16.69%
1998	4.77%	13.95%
1999	6.79%	13.34%

This cooldown in FDI coupled with difficulties in the domestic banking system. The number of loss-making SOEs has increased from 17 percent (1995) to 22 percent (1996) and then to 30–35 percent (1997). In a number of banks, overdue debts had reached alarming levels, reducing the confidence of depositors in the banking system. The low performance of the SOE sector and its trade tax receipts have reduced resources for public spending. The government therefore has had to restrain both current and capital expenditures.

Despite a double-whammy of insolvent debts and a decline in foreign investment, Vietnam fared much better than its East Asian neighbors. In 1997, while growth in Vietnam's neighboring countries such as Indonesia, Malaysia, and Philippines plummeted, Vietnam still enjoyed a positive growth rate as high as 5.8 percent. In 1998, while most of the surrounding economies experienced negative growth, Vietnam's GDP growth only dropped 1 percent from previous year, the lowest drop in the region.

One of the primary reasons for the low impact of the crisis to Vietnamese economy is that the financial sector was not entrenched at that point. As mentioned above, most of the foreign investments were FDI. There was no stock market until 2000. Ironically, thanks to Vietnam's slow institutional reforms and further economic policy reforms that should've taken place required by the market process, there was little portfolio investment or external flows into the banking system or local financial markets. Vietnam was not hit by the factors that caused the financial crisis spread: slumping currencies, devalued stock markets and an abrupt rise in private debt. The process of production structure shifting is still heavily determined by discretions and administrative decisions of the government than by the market. The crisis gives the government the legitimacy of continued state investment led by the state-owned banks for moderating the negative effects of the markets.

Following the export-oriented industrialisation model, Vietnam experienced vast expansion in exports in the decade prior to the crisis. The sustained export performance can be attributed to its diversity, which also offered a cushion to the crisis' damage. Crude oil, rice, garments, and rubber maintained a high share of total exports. Since most of the export goods have an inelastic demand, the sharp drop in prices does not affect the quantity demanded for these export goods. In 1999 alone, even while the world prices were declining, Vietnam's export sector kept on growing at 23 percent.

Vietnam was still in an embryonic stage of development when the crisis spread and as a result, investors had only a few "narrow channels" such as FDI. The capital market was not liberalized and the banking system was young but weak, which meant none of the flighty portfolio speculation that results in bubbles. And because the majority of the banking system was government-owned, the banks acted as a countercyclical agent, continuing to lend rather than panicking and pulling out.

Conclusion: Where did the Delta-A go?

For all the improvements that the Vietnamese economy made during the period, the growth accounting still suggests that the yearly change in total factor productivity – that is, the improvement in technology and efficiency – was mostly negative. The growth, as it turns out, was largely driven by massive amounts of capital mobilization, much of it from foreign sources, as well as an increasingly well-educated workforce (human capital growth).

One possible factor in this is government corruption, which is still rampant in Vietnam to this day. In 2002, the Transparency International Corruption Perceptions Index ranked Vietnam 85th out of 102 nations in cleanliness. Corruption can have a stifling effect on innovation. It encourages firms to put more of their resources into rent-seeking and lobbying with the government for favorable treatment, resources that could otherwise be spent developing technologies to gain a competitive edge. For example, despite their lackluster profitability, state owned enterprises remained a significant share of the economy, and they certainly weren't kept around for efficiency's sake. Even if capital stock is growing and output per capita is increasing, an environment of rampant rent-seeking would disincentivize any kind of structural reform. Nothing hurts corrupt officials more than a shake-up.

It may also be the case that the reforms mostly served to mobilize underutilized potential – in effect, push Vietnam toward the production possibilities frontier. Indeed, the primary consequence of the liberalization of the economy was that both capital and labor were able to move freely, and settled into their natural states. Farmers were allowed to start their own plots. Inefficient state-owned enterprises, kept around for the sake of ideological purity, were replaced with properly run, privately owned farmland. And when the environment became business-friendly and capital came swooping in, the labor simply followed the capital. In effect, the

Vietnam of 1989 was not at its full capacity. Once that capacity is reached, then delta-A has room to push the PPF outward.

Finally, there is the ever-pervasive problem of labor skill. Despite relatively high levels of literacy, roughly four out of five Vietnamese farmworkers are considered unskilled. Because capital growth was reliant on FDI, there was never an incentive for Vietnamese to innovate for themselves. Industries which leveraged Vietnamese competitive advantage, particularly labor-intensive agriculture and manufacturing, tended not to be ones that fostered creativity or innovation. There's only so much you can learn from stitching together shirts.

In order to gain a deeper insight into Vietnam's total factor productivity growth, or the lack thereof, it would help to dive deeper into the specifics of how the foreign direct investment came to be. The terms of the contracts, the technologies that foreign firms brought with them, the organizational structure of the plants and whether or not Vietnamese workers were placed into managerial or engineering positions. If FDI-led growth is to result in delta-A, there needs to be that human element in the mixture, the exposure of local people to the modes of thought that drive innovation in developed nations.

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Appendix: Growth Accounting Tables

Year	GDP (Constant Local Currency Units)	Value of Capital Stock (Constant LCU)	Human Capital Devlopment (Barrow-Lee)	Labor Force		Growth of GDP	Growth of Capital Stock	Growth of Human Capital	Growth of Labor Force
1989	5.22E+14	3.293E+14	4.208	2.786E+09		5.10%	10.16%	-2.57%	2.45%
1990	5.48E+14	3.628E+14	4.1	2.855E+09		5.96%	10.08%	3.66%	3.79%
1991	5.81E+14	3.994E+14	4.25	2.963E+09		8.65%	14.46%	3.53%	1.99%
1992	6.31E+14	4.571E+14	4.4	3.022E+09		8.07%	17.93%	3.41%	1.71%
1993	6.82E+14	5.391E+14	4.55	3.074E+09		8.84%	22.13%	3.30%	2.72%
1994	7.42E+14	6.584E+14	4.7	3.157E+09		9.54%	21.05%	3.19%	2.45%
1995	8.13E+14	7.969E+14	4.85	3.235E+09		9.34%	19.64%	3.26%	2.42%
1996	8.89E+14	9.534E+14	5.008	3.313E+09		8.15%	17.61%	3.15%	1.46%
1997	9.62E+14	1.121E+15	5.166	3.361E+09		5.76%	16.69%	3.06%	3.24%
1998	1.02E+15	1.309E+15	5.324	3.470E+09		4.77%	13.95%	2.97%	2.84%
1999	1.07E+15	1.491E+15	5.482	3.569E+09		6.79%	13.34%	2.88%	2.37%
2000	1.14E+15	1.690E+15	5.64	3.653E+09		6.19%	12.95%	2.77%	2.21%
2001	1.21E+15	1.909E+15	5.796	3.734E+09		6.32%	12.91%	2.69%	3.07%
2002	1.28E+15	2.155E+15	5.952	3.848E+09		6.90%	12.76%	2.62%	2.01%
2003	1.37E+15	2.430E+15	6.108	3.926E+09		7.54%	12.43%	2.55%	2.64%
2004	1.48E+15	2.732E+15	6.264	4.029E+09		7.55%	12.24%	2.49%	2.30%

Year	Growth of GDP	Growth of Capital Stock * α	Growth of Human Capital * (1- α)	Growth of Labor Force * (1- α)	Implied growth in Total Factor Productivity
1989	5.10%	3.39%	-1.71%	1.63%	1.79%
1990	5.96%	3.36%	2.44%	2.53%	-2.37%
1991	8.65%	4.82%	2.35%	1.33%	0.15%
1992	8.07%	5.98%	2.27%	1.14%	-1.32%
1993	8.84%	7.38%	2.20%	1.81%	-2.55%
1994	9.54%	7.02%	2.13%	1.64%	-1.24%
1995	9.34%	6.55%	2.17%	1.61%	-0.99%
1996	8.15%	5.87%	2.10%	0.97%	-0.79%
1997	5.76%	5.56%	2.04%	2.16%	-4.00%
1998	4.77%	4.65%	1.98%	1.89%	-3.75%
1999	6.79%	4.45%	1.92%	1.58%	-1.16%
2000	6.19%	4.32%	1.84%	1.47%	-1.44%
2001	6.32%	4.30%	1.79%	2.05%	-1.83%
2002	6.90%	4.25%	1.75%	1.34%	-0.44%
2003	7.54%	4.14%	1.70%	1.76%	-0.07%
2004	7.55%	4.08%	1.66%	1.53%	0.28%

Data all from the World Bank