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# Effects of Trade Liberalization on Non-farm Household Enterprises in Vietnam

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# Effects of Trade Liberalization on Non-farm Household Enterprises in Vietnam

Tran Quoc Trung and Nguyen Thanh Tung*

***Abstract:*** *This paper evaluates multiple indirect effects of trade liberalization on performance and business behaviours of NFHEs during the transition period in Vietnam based on the industry and enterprise panel data. The paper shows that NFHEs in the benefited industries from trade liberalization had more opportunities to expand their operations or start up and were more likely to survive. However, this is only applicable for NFHEs in labour intensive and unskilled industries and the expansion of NFHEs in these industries did not go together with the improvement of their efficiency. On the other hand, NFHEs in the almost negatively affected manufacturing industries from trade liberalization had to face with the fiercer competition and many of them had to shutdown their operations. Nevertheless, the survived NFHEs had better and high performance and had more chance to become formal SMEs. We also find that the more openness and the lower tariff increased the NFHE income in the industry but these effects were not the same for NFHEs in different industries. There are some concerns for the future role and development of NFHEs in the face of increasing international competition in the market.*

Key words: Trade liberalization; Non-farm household enterprise; Panel data; Vietnam.

JEL Classifications: C23; F14; O12; O14; O24; O53.

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## 1. Introduction

Vietnam has made a considerable progress in the improvement of its people living standards and well-being since the "turning-point" of major economic reforms, called "*doi moi"* in 1986. Its trade policy has changed significantly toward an outward-oriented one since then. As the result, Vietnam is seen as one of the most successful economies in transition and its economy has experienced high economic growth rate of 7.4% annually on average over the 1991-2003. Its total merchandise exports surged 25 folds to more than US$ 20 billion in 2003 over 1986 and from a much closed economy, Vietnam economy's openness has better changed (Figure 1). Importantly, under the wave of economic growth, the poor dropped dramatically from 58% of the population in 1993 to 37% in 1998 and 29% in 2002, the material conditions and quality of life of its people and social equality gradually improved (World Bank, 2002 and GSO, 2003). One of the important contributions to these successes is the dynamics of the non-farm household sector. This sector has quickly adjusted to capture the positive effects of "*doi moi"*.

It is found that employment and income sourced from non-farm household enterprises (NFHEs) have played an important role in the development process over the last ten years. Nearly one-fifth of employed population and one-fourth of household income were generated from NFHEs in 2002. The involvement in a NFHE can improve household living standards, reduce the incidence of poverty and more importantly increase the household income over the transition period. Although NFHEs increased inequality in Vietnam between 1993 and 1998 but not in terms of marginal incidence between 1998 and 2002 and more importantly there were the pro-rich evidence over 1993-1998 period but pro-poor over 1998-2002 period among NFHE activities. NFHEs played an increasing role for rural areas in terms of income generation and job creation but reducing role for urban areas. In urban areas, however the development of NFHEs was an important source for the development of formal small and medium enterprises (SMEs) (Vijverber, 1998; Vijverber and Houghton, 2002, Trung, 2000; Trung *et. al.,* 2005).

As laid out in the Ten Year Socio-Economic Development Strategy, Vietnam aims to double its GDP over the coming decade and to create 1.4 - 1.5 million new jobs annually. The Comprehensive Poverty Reduction Strategy also sets the target to reduce the incidence of overall poverty by two fifths and food poverty by three fourths from 2000 to 2010. These

seem to be ambitious objectives, largely because the agriculture sector is now facing many constraints such as: landlessness, scarcity of land, and labour surplus. State owned enterprises (SOEs) are restructuring and also facing labour redundancy. The inflow of foreign direct investment still remains stably low, which tightens the labour demand in this sector. The public administration sector is under reform. Furthermore, over 90% of the poor live in rural areas and over one-fourth of the rural labour force are underemployed (World Bank, 2002; SRV, 2002; CIEM, 2003a). Therefore, the non-farm household sector is expected to grow more rapidly to help attain those growth and job-creation goals. However, whether the sector could fulfil this important task in the next accelerated integration into the world economy and/or how to develop this non-farm household sector effectively are still very practical questions due to their various possible difficulties and vulnerabilities in terms of economies of scale, efficiency, productivity, innovation, market power, technology, capital, human resources, management, and marketing practice, etc.

The main objective of this paper is to evaluate multiple indirect effects of trade liberalization on performance and business behaviours of NFHEs in the context of economic environment change during the transition period in Vietnam. The paper was prepared based on the constructed industry panel data collected in Vietnam Living Standards Surveys (VLSSs) in 1993 and in 1998 and Vietnam Household Living Standards Survey (VHLSS) in 2002 and the constructed enterprise panel data collected in VLSSs in 1993 and in 1998. Furthermore, it also uses the constructed import, export and tariff data by International Standard Industrial Classification (ISIC) at two digit level over 1993-2002 period and other data sources for the analysis.

The paper consists of 4 sections. The following Section 2 presents an overview on trade liberalization reforms and policies in Vietnam which has made a considerable contribution to the high economic growth and the development of the country. Section 3 mentions the effects of trade liberalization on performance of NFHEs across different industries in Vietnam based on the industry panel data over 1993-1998-2002. It also analyses the dynamics of NFHEs in reacting to the effects of trade liberalization based on the enterprise panel data over 1993-1998. Section 4 ends the paper with some conclusions.

## 2. Overview of Trade Liberalization Reforms and Policies in Vietnam

The foundation for Vietnam's success – and the core of *doimoi* program – has been a combination of liberalization, stabilization, institutional changes, and some structural reforms (Kokko, 1997:1). The reform process includes the followings[1]:

- Moving towards an outward-oriented external policy;
- Replacement of administrative controls with economic ones;
- Devolution of economic power from State to SOEs; and restructuring of SOE sector;
- Acceptance of the private sector as an important factor in the development process, and creation of a legal framework for the functioning of corporate sector;
- Promotion of agriculture by de-collectivization and granting land rights to individuals and allowing farmers to trade in the market;
- Price and internal trade liberalization;
- Budgetary reform and financial sector reform.

An important aspect of the renovation process was the complete turnaround of external sector policy from inward-oriented import substitution to outward-orientation. The reform of Vietnam's trade policy thus had two main objectives (Auffret, 2003), namely:

- The first objective was to make the transition from the centrally planned to a market-oriented economy;
- The second objective was to promote export-oriented industries by redressing the anti-export bias embodied in the protectionist regime.

Though the idea of trade reform was raised in 1986 with the open door policy, it is until 1989 that trade liberalization has progressively started. Since then, Vietnam's trade policy has changed significantly toward an outward-oriented one, and there is no doubt that trade liberalization – one of the key elements of the reform process – has made a considerable contribution to the high economic growth and development of the country. Trade policy reforms in Vietnam comprised of the shift from the state monopoly in foreign trade sector towards a more competitive system with increasing participation of private sector, the relaxation of controls on entry into foreign trading activities[2], the abolishment of non-tariff

[1] Extracted from CIE 1998, CIE 1999

[2] Trade entry conditions prior to 1998 included foreign trade contract, working capital requirement, shipment license, skill in trade requirement, import/export license, business license.

barriers[3], the reform towards a tariff-based system of trade management[4], introduction of export incentives[5], the integration with the world economy via regional and multilateral trading agreements[6], the unification of multiple exchange rate system and the establishment of a more realistic market-based exchange rate by means of successive devaluation.

## 3. Effects of Trade Liberalization on Performance and Business Behaviors of NFHEs in Vietnam

In this section we will focus on analyzing the effects of trade liberalization on performance of NFHEs across different industries based on the constructed industry panel data collected in VLSSs in 1993 and in 1998 and VHLSS in 2002 and exploring the effects of trade liberalization on business behaviors of NFHEs based on the constructed enterprise panel data collected in VLSSs in 1993 and in 1998. The industry-level analysis describes the distribution, income and income growth of enterprises across industries and their changes in linkages with trade liberalization at any point in time, while the enterprise-level analysis provides additional information on the dynamics underlying the distributions and performance of enterprises, particularly their entry and exit, and the possible impact of trade liberalization on these dynamics.

[3] Non-tariff barriers (NTBs) in Vietnam including the quotas and targets have been progressively abolished. Before 2001, annually NTBs were regulated by a Prime Minister's decision. However except textile and garment for quota markets and a list of sensitive goods, all quantitative restrictions on exports have been already phased out since 2001. By early 2003, all quantitative restrictions on imports have been eliminated with the exception of sugar (by 2005) and petroleum products. Furthermore, Vietnam has also applied some other non-tariff barriers to control international trade: customs surcharges, stamping imported goods, quality inspection, the controls on processing contracts to foreign partners, and import prohibitions.

[4] The current tariff structure, which has been implemented since 1998, has three sets of rates: (i) MFN tariff rates (ii) CEPT rates applicable to imports from ASEAN countries; and (iii) General rates (no higher than 50% above the MFN rates) applicable to imports from countries that do not fall under the MFN and CEPT categories. Vietnam also imposes export taxes on a range of primary products and raw materials – including marine products, wood products, mineral ores. Currently, export tax system consists of 10 rates ranking from 0% to 45% with the average rate of 14%.

[5] There have been a number of direct measures to promote exports – including import-tariff exemption of inputs for exporters, exemption from domestic taxes i.e. VAT and Special Sales Tax for export production, export financing schemes, development of export processing zones and increasing role of export promotion agencies and business associations.

[6] Up to now, Vietnam has signed bilateral trade agreement with 89 countries and teritories including EU in 1992 and USA in July, 2000 and has become a member of ASEAN since July, 1995 and of APEC since November, 1998. Currently, Vietnam has completed the 'transparency' phase of accession to the WTO, and is now entering into the market access negotiations with WTO members. Its number of trading partners has increased from about 30 countries and territories in 1986 to 224 in 2002.

## 3.1. Industry Level Analysis for 1993-1998-2002

### *3.1.1. Linkages between Import and Export Performance and Tariff*

Figure 2 shows different average tariff rates by ISIC of Vietnam during 1998-2002 in different industries. It is observed that general tariff and MFN rates by ISIC did not change much or even slightly increased in some industries i.e. agriculture, fishing, mining, manufacture of textiles, paper, non-metallic mineral products, basis metals, fabricated metal products, machinery and equipment, electrical machinery and apparatus and transportation vehicles. However, the intensified integration with the world economy via regional and multilateral trading agreements and the implementation of AFTA commitments bought about a reduction in weighted tariff rates[7] in almost industries except manufacture of electrical machinery and apparatus and other transport equipment.

The linkage between import and export performance and tariff by ISIC of Vietnam during 1998-2002 in different industries is presented in Figure 3 and Figure 4. It shows that the reduction in tariff rates went parallel with the increased imports in almost industries except the fishing, garment and electronic industries. For those industries with high tariff rates, the imports increased moderately or reduced except the textiles, papers, rubbers and plastics, fabricated metals and transportation vehicles and vice versa. It also shows that the reduction in tariff rates went parallel with the increased exports in almost industries except some services related activities.

The difference between import structure and export structure can be observed in Figure 5. While Vietnam has export potentials and advantages in agriculture, fishing, mining, labor intensive manufacturing industries including food processing, textiles and garments, leather and footwear, wood products and furniture (as measured by big export volume and sharply increased exports between 1998 and 2002), it has to reply on the world market for most capital intensive industries i.e. petroleum, chemicals, plastics, metals, machinery and equipment, electronic products and transportation vehicles (as measured by big import volume and rapidly increased imports between 1998 and 2002).

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[7] $WTR_j = \sum_{i=1}^{3} t_i s_i$

where i=1,2,3: 1=ASEAN countries, 2=MFN countries and 3=other countries and j=1,2,...99. $WTR_j$ is the weighted tariff rate by industry j, $t_i$ is the average tariff rate for country i by the industry j and $s_i$ is the imported share for country i by the industry j. It assumes that the trading pattern among ASEAN countries, MFN countries and other countries are the same.

### *3.1.2. Distribution of NFHEs by Industry Affected by Trade Liberalization*

This section examines NFHEs in industries[8] which are mostly affected by trade liberalization[9] or have opportunities to export their products or get benefits from the integration process and drop NFHEs in industries such as commerce, transportation, construction, hotels and restaurants and other services which are insignificantly affected by trade liberalization by using the industry panel data collected in VLSSs in 1993 and 1998 and VHLSS in 2002. The industry panel data was constructed from enterprise data in the industry classified by ISIC at two digit level for each year in question. Some indicators of NFHE performance by the industry in terms of number of NFHEs, rate of enterprises with business registrations, income growth[10], rate of loss-making enterprises, labor productivity, mean total assets and mean number of workers were calculated. The sampling weights of surveys in 1998 and 2002 were utilized to construct the industry panel data. It is important to note that the constructed indicators by industry are unbiased because they reflect the performance of all NFHEs within the same industry in question. However, the structure of NFHEs by industry only reflects enterprises in the selected industries affected by trade liberalization. This does not seriously affect the results of the analysis because it is used in the relative terms. The constructed indicators by the industry are analyzed in close linkages with import - export performance and tariff by the industry as mentioned above.

As Figure 6 shows the share of NFHEs in agriculture services, fishing, food processing, textiles and garments, wood products and furniture sharply increased from 56% in 1993 and 72% in 1998 to 84% in 2002. These industries also gained relative high export growth rates in 1994-1998 or/and 1998 and 2002. They accounted for as large as half of total export volume of Vietnam in 2002. While the share of NFHEs in manufacturing industries including footwear and leather, paper, chemicals and chemical products, rubber and plastics products, non-metallic mineral products, basis metals, fabricated metal products, electrical and electronic products, machinery and equipment, electrical machinery and apparatus and transportation vehicles was substantially reduced from 13% in 1993 to 7% in 1998 and 5% in 2002. These industries were observed with high import growth rates and a reduction in

[8] Around 45% of NFHEs were operated in these industries over 1993 - 2002. This figure was slightly increased from 46% and 42% respectively in 1993 and 1998 to 48% in 2002.

[9] Industries which are significantly affected by trade liberalization are measured by import or export as percentage of GDP for each industry of more than 0.1%.

[10] The income growth is calculated based on mean total income of NFHEs at January 1998 prices adjusted by monthly CPI and regional CPI.

weighted tariff rates and accounted for around three-fourths of total import volume of Vietnam over 1993-2002. Of course, these industries require high skilled workers and large capital investment and usually belong to large enterprises not small ones.

Regarding to the performance of NFHEs by industry, on average, the share of NFHEs with business licenses was relative unchanged and around 12% between 1998 and 2002. The share of NFHEs with business licenses in the benefited industries from trade liberalization was slightly increased in agriculture services and wood products and furniture but sharply reduced in fishing, food processing, textiles and garments. While the share of NFHEs with business licenses in the negative affected manufacturing industries from trade liberalization was significantly increased in almost industries except paper, non-metallic mineral products, electrical machinery and apparatus.

As Table 1 shows that the share of loss making NFHEs tends to increase on average from 6.9% in 1993 to 7.4% in 1998 and 10.4% in 2002. However, only NFHEs in fishing and electrical machinery and apparatus experienced a sharp increase of loss-making enterprises. The share of loss making NFHEs in other industries tends to reduce over 1993 - 1998 - 2002. Furthermore, it is also observed that the real NFHE income in fishing substantially reduced by 37% between 1998 and 2002 after reaching the peak between 1993 and 1998. This suggests that although NFHEs in fishing gained benefits from the increased exports, the rate of return of NFHEs in the industry sharply reduced in this period. This can be partially explained by the rapid expansion of the industry, the high market entry rate of newly started-up enterprises, increased input costs (i.e. fuels) and increased scarcity of fishes.

On average, the real NFHE income in the benefited industries from trade liberalization was substantially increased in fishing and textiles and garments and relatively did in food processing but slightly reduced in wood products and furniture agriculture services between 1993 and 1998. While the real NFHE income in food processing, wood products and furniture was relatively increased but slightly reduced in agriculture services, textiles and garments between 1998 and 2002. However, it is observed the significant growth of real NFHE income in the almost negative affected manufacturing industries from trade liberalization except electrical machinery and apparatus in 1993-2002 period (Table 1). This can be explained that the number of NFHEs was too crowed in the benefited industries from trade liberalization but less crowed in the almost negatively affected manufacturing industries from trade liberalization. The other reason is that in such fierce competition only high efficient NFHEs had chance to survive, expand their operations and improve their

performance and the less efficient NFHEs terminated their businesses. Although Vietnamese economy has experienced high economic growth rate of 7.4% annually on average over the 1991-2003, the total NFHE income only increased 5.2% over 1993 - 1998 and reduced 0.36% over 1998 - 2002 annually on average.

The mean number of workers of NFHEs was relatively reduced but their mean total assets was almost double between 1993 and 1998. This contributed to raise their labor productivity as high as 1.5 times in this period.

### *3.1.3. Performance of NFHEs by Industries*

To measure the effect of trade liberalization on industry performance of NFHEs, fixed-effects (within) model will be developed and applied by using an unbalanced industry panel data collected in VLSSs in 1993 and 1998 and VHLSS in 2002. The model can be demonstrated with the following equation:

$$Y_{it}=F(X_{it}, \nu_i, \varepsilon_{it})$$

where $Y_{it}$ denotes industry performance as measured by mean NFHE income in the industry i in period t; $X_{it}$ is a vector of trade variables (i.e. weighted tariff[11] by industry i at year t or actual openness of industry i in period t as measured by (exports + imports)/GDP for industry i at year t or export per GDP and import per GDP by industry i at year t); $\nu_i$ is the fixed effect; $\varepsilon_{it}$ is the pure residual. The model will be estimated by performing fixed effects estimation[12]. The estimates are conditional on the sample in that the $\nu_i$ are not assumed to have a distribution, but are instead treated as fixed and estimable.

Some interesting findings in terms of the effect of trade liberalization on industry performance of NFHEs emerge from Table 2. Although the regression models do not have much explanatory power (in terms of goodness of fit, the $R^2$ within is less than 0.2 - this means that less than 20% of the variation in industry performance is explained by the within model. If, however, we use these estimates to predict the between model or to fit the overall data our $R^2$ between or $R^2$ overall are much lower).

The estimated results show that trade liberalization is good for NFHEs. The more openness and the lower tariff increase the NFHE income in the industry in the 1993-1998-2002 period.

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[11] See footnote 7.

[12] Hausman specification test shows that a random-effects model of industry performance is rejected.

However these effects are not the same for NFHEs in different industries. The interaction between openness or tariff and the industry dummy appears to be statistically significant for NFHEs in the almost negatively affected manufacturing (import-substituted) industries but not for NFHEs in the benefited (export-oriented) industries from trade liberalization.

## 3.2. Firm Level Analysis for 1993 - 1998

### *3.1.1. Dynamics of NFHEs: Entry and Exit*

Figure 7 illustrates changes and possible outcomes of NFHEs between 1993 and 1998. It is observed that the changes in business environment affected the business behaviors of NFHEs between 1993 and 1998. As Figure 8 shows, NFHEs surveyed in 1993 operated in different industries. After five years up to 1998 the operations of NFHEs have been changed. The results show that there were 2,801 enterprises in the 1993 survey, of which 311 occurred in households that disappeared in the 1998 survey (attrited enterprises) and 766 were located in households that did not report any enterprises in the 1998 survey (terminated enterprises). This left 1697 enterprises that responded to the 1998 survey, of which 654 operated in the same industry (survived enterprises), 666 operated in the different industry (changed enterprises) and 377 were newly started-up (started-up enterprises) between 1993 and 1998. Furthermore, there were 696 newly started up enterprises in the 1998 survey that were located in households that did not report any enterprises in the 1993 survey. This implies an entry rate of 57.5% and an exit rate of 69.9% between 1993 and 1998. These entry and exit rates are quite high in comparison with other international findings.

In some industries i.e. food processing, textiles and garments, commerce; and transportation, it is observed the extremely high rates of entry and exit between 1993 and 1998 while in some other industries i.e. forestry services and hotels and restaurants the exit rate was very high. Although these service industries were insignificantly affected by trade liberalization, there was high competition in the domestic market in the industries. These service industries had larger share of loss-marking NFHEs. This suggests that a large number of entrepreneurs instead of sought for high profit and manufacturing industries which require high skills and large investment capital, they mainly concentrated in low profit and service industries which require low skills and small investment capital over 1993-1998 period. There were high concentrations of NFHEs in some particular industries for both existing enterprises and newly started-up ones. This suggests that the decision of entrepreneur to start up a new business was partially affected by and depended upon the preceding one.

In the industries which were significantly affected by trade liberalization, it finds that industries such as agriculture services, fishing, manufacture of food products and beverages, textiles and garments, wood and wood products had high rate of entry and exit between 1993 and 1998. These industries experienced extremely high growth rates of import and exports in the same period. However, the rate of started-up enterprises was higher than that of terminated ones. This suggests that NFHEs in these industries were able to compete with the imports and benefit from the increased exports. While in other industries like manufacture of footwear and leather products, paper, coke, chemicals and chemical products, rubber and plastics products, fabricated metal products, electrical and electronic products where it was observed high growth rates of export however, NFHEs almost did not get any benefits. Because these industries require high skilled workers and large capital investment and usually belong to formal and big enterprises not small ones.

### *3.1.2. Performance of NFHEs by Industries Affected by Trade Liberalization*

As Table 3 shows the performance in terms of employment, assets, income growth and labor productivity of NFHEs[13] by industry affected by trade liberalization in the enterprise panel data. It is observed that NFHEs in the benefited industries from trade liberalization[14] were more likely to survive while NFHEs in the almost negative affected manufacturing industries from trade liberalization[15] were less likely to survive between 1993 and 1998. For the survived NFHEs, their real income growth was around 30% on average in this period. The real NFHE income in the benefited industries from trade liberalization was substantially increased in fishing and textiles and garments and food processing but significantly reduced in agriculture services, wood products and furniture. While there was the significant growth of real NFHE income in the almost negative affected manufacturing industries from trade liberalization. The mean number of workers of NFHEs was relatively reduced from 2.5 workers to 2 workers but their mean total assets was increased as high as 1.8 times in 1993-1998 period. This made their labor productivity increase as high as 1.4 times.

[13] Of 1697 enterprises in all industries were either continued or stared up or changed their businesses to new industries, there were 200 survived enterprises in industries affected by trade liberalization between 1993 and 1998.

[14] As measured by export as percentage of GPD of more than 0.5% and average growth rate of export of more than 30% between 1993 and 1998.

[15] As measured by import as percentage of GPD of more than 0.5% and average growth rate of import of more than 30% between 1993 and 1998.

### *3.1.3. Effects of Trade Liberalization on Dynamics of NFHEs*

To quantitatively analyze the effect of trade liberalization on business behaviors of NFHEs between 1993 and 1998, a Multinomial Logit Model[16] will be employed. The model analyses the probability of being in a particular state out of several unordered alternatives. The model examines the probability of NFHE being in one of the four possible outcomes: (1) being an enterprise operated in both periods, (2) being an enterprise terminated between 1993 and 1998, (3) being an enterprise changed to new industry between 1993 and 1998, and (4) being an enterprise newly started up between 1993 and 1998. The dependent variable in the model is a dummy variable representing whether one of these four possible outcomes. Trades variables (export and import by industry, weighted tariff by industry and type of industry[17]) and other variables (the characteristics of the household; the characteristics of infrastructure including electricity, road, waterway, local market, factory, handicraft; and eight regions of Vietnam) at different levels of aggregation are explanatory variables in the model.

Result of the Multinomial Logit Model regression is presented in Table 4. It shows the results for all three categories (E → NE i.e. being terminated enterprise between 1993 and 1998 is treated as the base category): being survived enterprise in both years (E → E), being enterprise changed to new industry between 1993 and 1998 (E → CE) and being started-up enterprise between 1993 and 1998 (NE → E). Table 4 gives the impacts of each explanatory variable on the relative risk ratios[18] (RRR) rather than the actual coefficients.

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[16] A Multinomial Logit Model is defined:

$$\Pr ob(Y_i = j) = \frac{e^{\beta_j' x_i}}{\sum_{k=1}^{4} e^{\beta_k' x_i}}, j = 1,2,3,4$$

where $Y_i$ is the outcome experienced by non-farm household enterprise i, $x_i$ is the (n x 1) vector of characteristics for non-farm household enterprise i, and $\beta_j$ is the (n x 1) vector of coefficients on $x_i$ applicable to NFHEs in state *j*. The model is identified only up to an additive vector since adding, say, vector *m* to each $\beta_k$ leads to the same probabilities of *Y = 1*, *Y = 2*, *Y = 3* and *Y = 4*. Thus, one $\beta_k$ must be chosen as the base category and set to zero. All other sets are then estimated in relation to this benchmark.

[17] We classify the type of industry where an enterprise operated in into three categories: (i) export industry including agriculture, fishing, food processing, garments and textiles, shoes and leather, wood products and furniture, electrical and electronic products; (ii) import industry including tobacco, paper, coke, petroleum products, chemicals and chemical products, rubber and plastics products, other non-metallic mineral products, basic metals, fabricated metal products, machinery and equipment, transportation vehicles; and (iii) other industry including forestry, mining, printing, and other services.

[18] The relative risk ratios are the ratio of the probability of each outcome relative to the probability of the base category. If we set *Y = 1* as our base category, the relative risk ratio for *Y = 2* for a change in each variable *x* is given by:

The significant determinants for surviving, changing and starting up an enterprise in the sample at 10% significant level presented in Table 4 can be summarized as follows:

| The following factors increase the probability of surviving enterprise in both years relative to being terminated enterprise between 1993 and 1998: | The following factors decrease the probability of surviving enterprise in both years relative to being terminated enterprise between 1993 and 1998: |
|---|---|
| ▪ Lager household size<br>▪ Locating in the commune with better road<br>▪ Locating in the commune with more frequency of local market<br>▪ Locating in the traditional handicraft and occupational village<br>▪ Higher import tariff<br>▪ Residing in the North Central Coast | ▪ Operating in the import industry<br>▪ Operating in the other service industry<br>▪ Residing in the Mekong Delta |
| The following factors increase the probability of changing enterprise between 1993 and 1998 relative to being terminated enterprise between 1993 and 1998: | The following factors decrease the probability of changing enterprise between 1993 and 1998 relative to being terminated enterprise between 1993 and 1998: |
| ▪ Lager household size<br>▪ Residing in the North West<br>▪ Residing in the North Central Coast | ▪ Older age of household head<br>▪ Operating in the import industry<br>▪ Operating in the other service industry<br>▪ Higher export<br>▪ Residing in the North East |
| The following factors increase the probability of starting-up enterprise between 1993 and 1998 relative to being terminated enterprise between 1993 and 1998: | The following factors decrease the probability of starting-up enterprise between 1993 and 1998 relative to being terminated enterprise between 1993 and 1998: |
| ▪ Lager household size<br>▪ Access to better electricity<br>▪ Locating in the commune with better road<br>▪ Residing in the North Central Coast | ▪ Older age of household head<br>▪ Operating in the import industry<br>▪ Operating in the other service industry<br>▪ Higher export |

## 4. Conclusions

There is no doubt that the reforms implemented under "*doi moi*" and trade liberalization in Vietnam have contributed to its high economic growth and development and better changed its economy's openness. The findings show that in rapid economic environment change

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$$\frac{\Pr ob(Y=2)}{\Pr ob(Y=1)} = e^{\beta' 2x}$$

where $e^{\beta(2)}$ is the relative risk ratio for a unit change in the variable *x*. Since all continuous variables have been standardized, the coefficients represent the impact of a one standard deviation change in each explanatory variable on the relative risk ratios of the enterprise being in each outcome. Any coefficient less than one implies that the variable reduces the probability of the enterprise being in the nominated category. The percentage change in the probability is given by the coefficient minus one, multiplied by one hundred. This rule applies to both dummy and continuous variables (Niimi, *et. al.*, 2003)

during the transition period, NFHEs in the benefited industries from trade liberalization had more opportunities to expand their operations or start up, increase their relative share in the whole industry and create more jobs and they were more likely to survive. However, only NFHEs in industries such as agriculture services, fishing, manufacture of food products and beverages, textiles and garments, wood products and furniture were more likely to capture opportunities created by the increased exports and were able to compete with increased imports, while NFHEs in other intensive capital manufacturing industries like manufacture of footwear and leather products, paper, coke, chemicals and chemical products, rubber and plastics products, fabricated metal products, electrical and electronic products almost did not get any benefits from increased exports and even lost their position or competition in the domestic market because of the increased imports and these industries require high skilled workers and large capital investment and usually belong to formal and big enterprises not small ones. However, the expansion of NFHEs in these industries did not go together with the improvement of their efficiency as observed by the reduced rate of return, increased share of loss-making enterprises, low income growth rate and crowded business environment.

On the other hand, NFHEs in the almost negatively affected manufacturing industries from trade liberalization had to face with the fiercer competition, reduce their relative share in the whole industry and many of them had to shutdown their operations. However, in terms of the efficiency, the survived NFHEs had better and high performance as measured by high income growth rate, small share of loss-making enterprises and less crowded business environment and had more chance to become formal SMEs as measured by higher share of registered enterprises.

The paper finds that although Vietnamese economy has experienced high economic growth rate of 7.4% annually on average over the 1991-2003, the total NFHE income in the selected industries affected by trade liberalization only increased 5.2% over 1993-1998 and reduced 0.36% over 1998-2002 annually on average. These entry and exit rates of NFHEs are quite high in comparison with other international findings. Furthermore, Trung *et. al.,* 2005 find that NFHEs are facing with many constraints in terms of low competition, differentiation and value added chain of products; weak marketing; poor and obsolete technology; weak entrepreneurial skills and low qualifications of non-farm entrepreneurs; insufficient business and market information; and shortage of capital and of skilled labourers, limited access to credit. These create more concerns for the future role and development of NFHEs in the face of increasing international competition in the Vietnamese market.

We also find the evidence that trade liberalization is good for NFHEs. The more openness and the lower tariff increase the NFHE income in the industry in the 1993-1998-2002 period. However these effects are not the same for NFHEs in different industries. Trade liberalization appears to have stronger positive impacts in terms of efficiency on NFHEs in the almost negatively affected manufacturing (import-substituted) industries than on NFHEs in the benefited (export-oriented) industries from trade liberalization. Survived NFHEs in the fiercer competition industries tend to expand their operations and improve their performance while survived NFHEs in export-oriented industries still had very limited links with and small benefits from increased exports[19].

[19] A recent survey of 1,400 non-state manufacturing SMEs having less than 100 employees indicated that only about 3% of the firms participated in export, despite the fact that Vietnam had the highest export growth in the world in the 1990's and even exceeded China's performance in the 1980's (Kokko and Sjöholm, 2004 and Thoburn, 2004).

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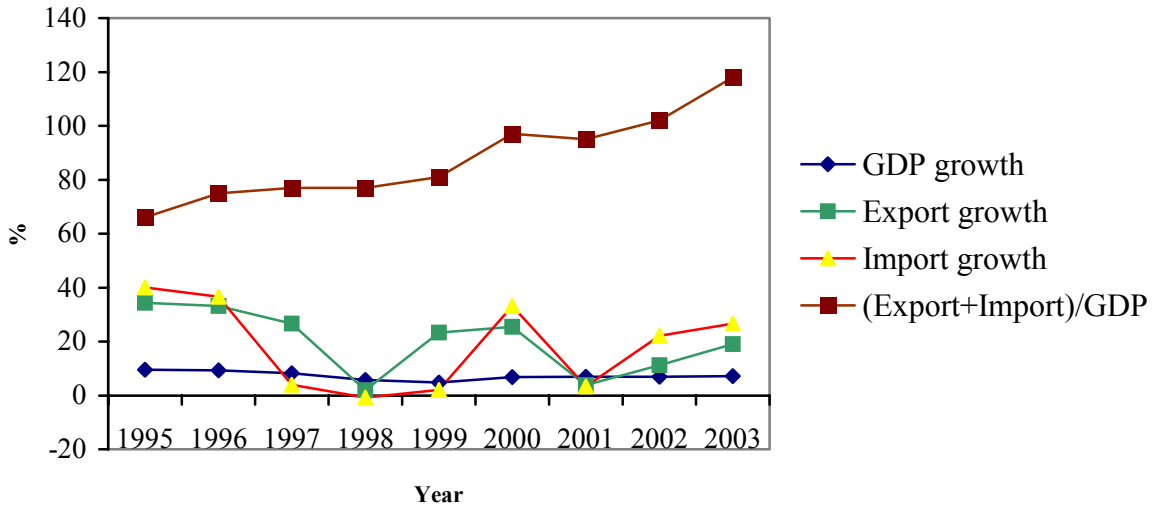
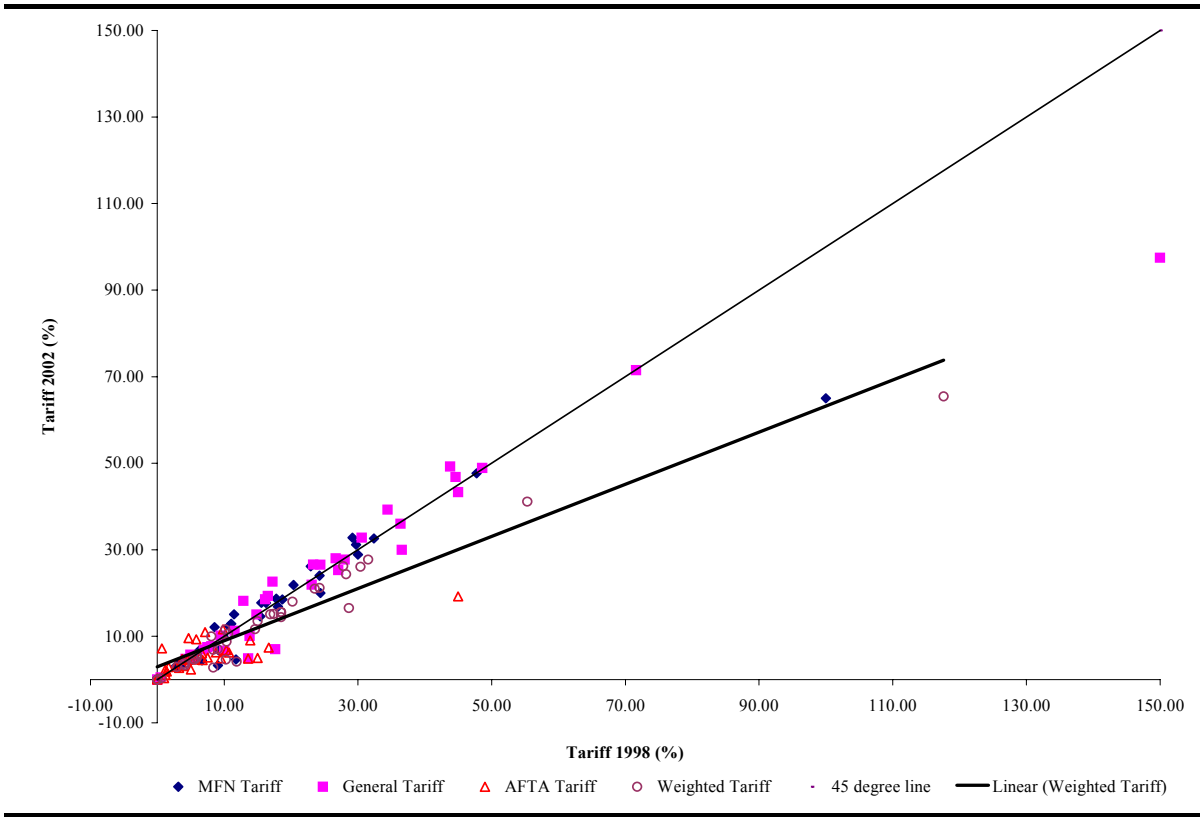
## Figure 1: Openness Growth Rate, 1995-2003, (%)



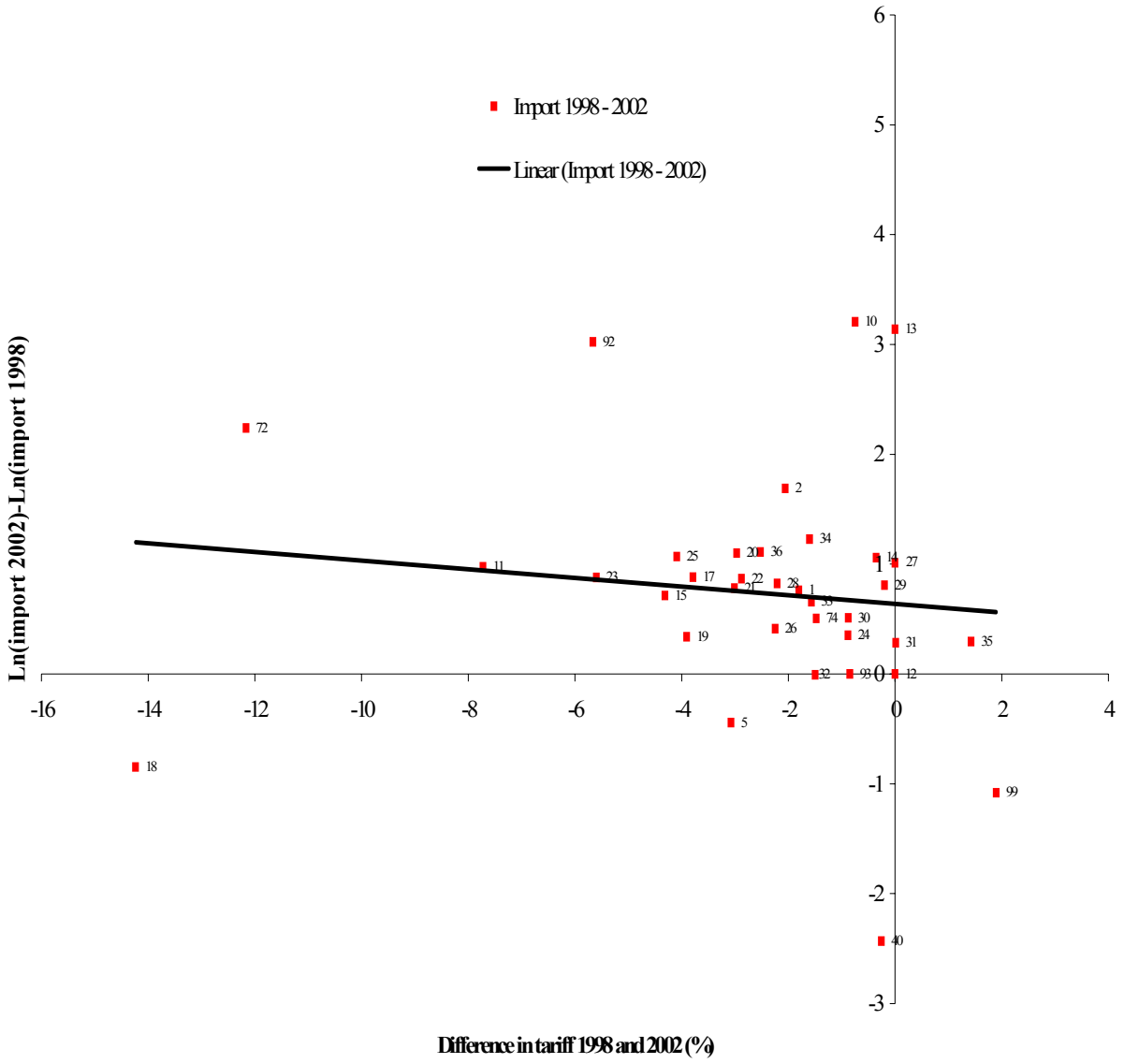

*Source: GSO, Statistical Yearbook, various years; * WIR, 2003, CIEM (2004)*

## Figure 2: Average Tariff Rates by ISIC Vietnam, 1998-2002



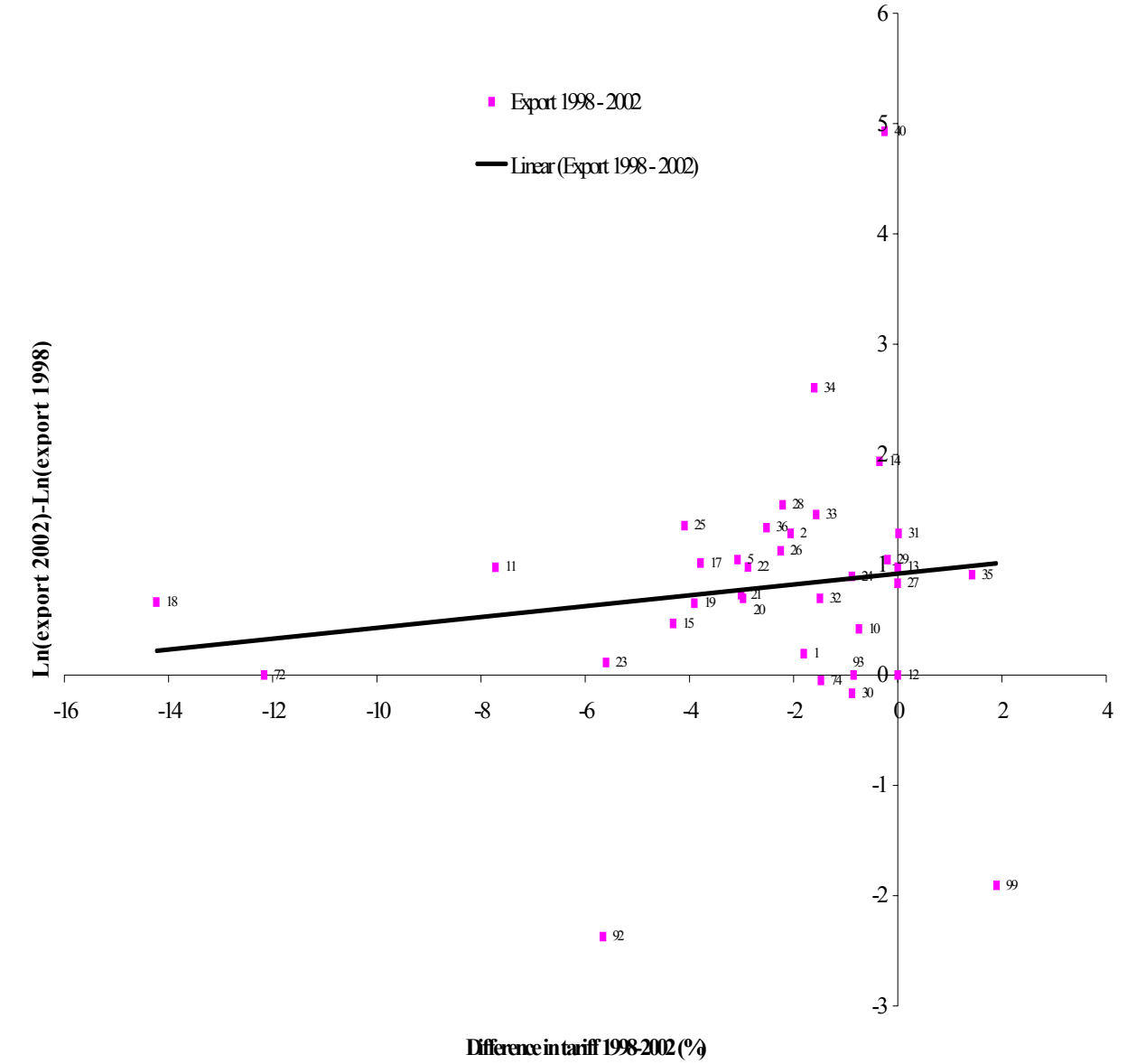

*Source: Calculated based on various tariffs of Vietnam*

## Figure 3: Import Performance and Tariff by ISIC Vietnam, 1998 - 2002



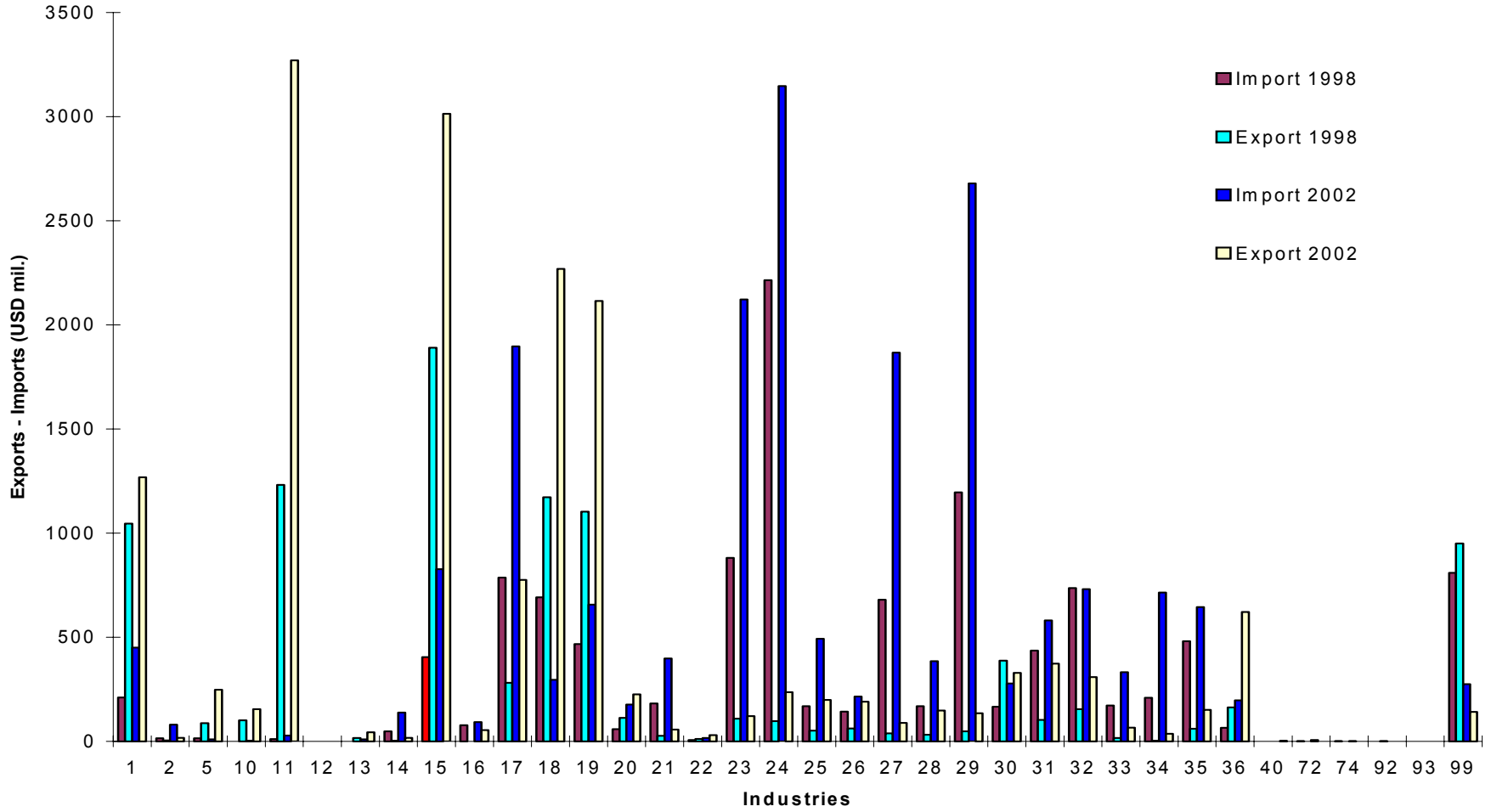

*Note:* *Omit industry 16 (manufacture of tobacco products) because of extraodinary high tax reduction*
*Source:* *Calculations based on international merchandise trade 1998 - 2002 and various tariffs of Vietnam*

## Figure 4: Export Performance and Tariff by ISIC Vietnam, 1998 - 2002



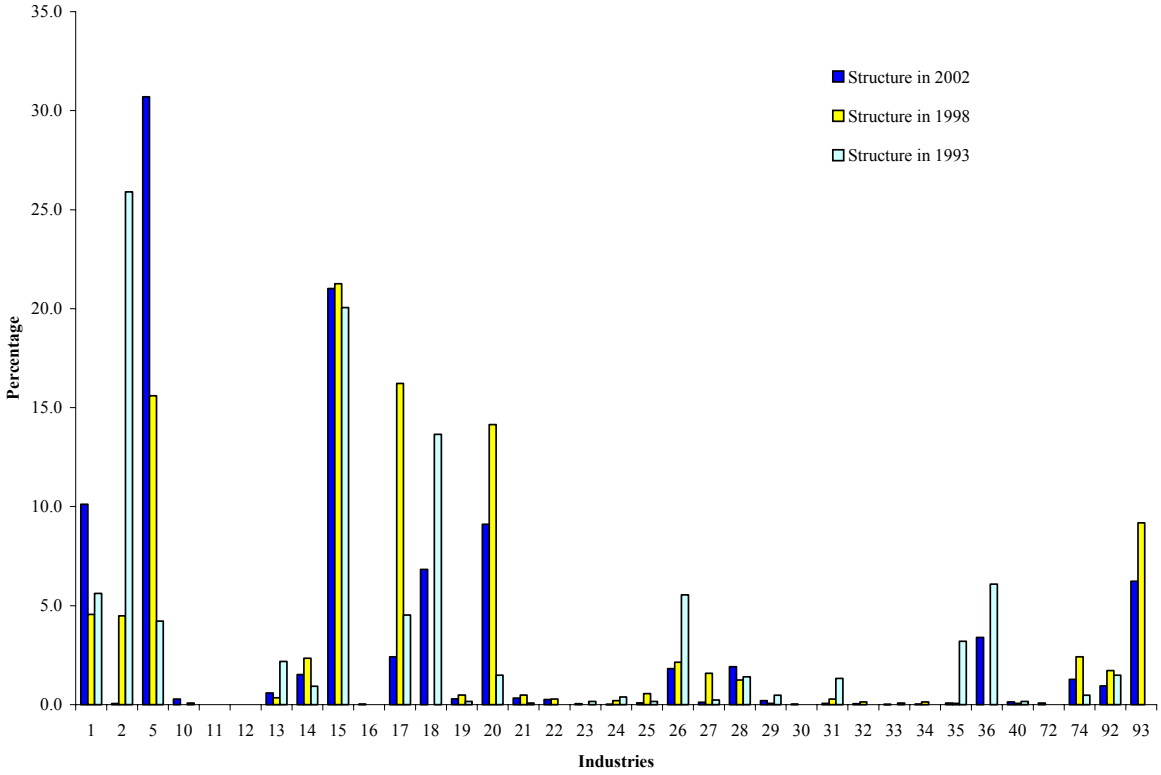

*Note:* *Omit industry 16 (manufacture of tobacco products) because of extraodinary high tax reduction*
*Source:* *Calculations based on international merchandise trade 1998 - 2002 and various tariffs of Vietnam*

**Figure 5: Import and Export Performance by ISIC Vietnam, 1998 - 2002**




*Source: Calculations based on international merchandise trade 1998 - 2002 of Vietnam*

## Figure 6: Structure of NFHEs by ISIC, 1993 - 1998 - 2002




*Source: Calculations based on data of VLSSs in 1993 and 1998 and VHLSS in 2002*

## Table 1: Income Growth and Loss Making of NFHEs by ISIC, 1993 - 1998 - 2002

*(percent, unless otherwise specified)*

| | 2002 | | 1998 | | 1993 |
|---|---|---|---|---|---|
| | Income growth (02-98) | Loss making | Income growth (98-93) | Loss making | Loss making |
| 01 - Agriculture, hunting and related service activities | -12.5 | 0.0 | -12.0 | 11.5 | 12.5 |
| 02 - Forestry, logging and related service activities | -1.9 | 0.0 | -45.0 | 6.3 | 1.8 |
| 05 - Fishing, aquaculture and related service activities | -37.5 | 31.6 | 141.0 | 4.3 | 1.9 |
| 10 - Mining of coal and lignite; extraction of peat | | 0.0 | | | 0.0 |
| 13 - Mining of metal ores | -34.5 | 0.0 | 131.0 | 0.0 | 0.0 |
| 14 - Other mining and quarrying | -24.5 | 1.2 | 366.0 | 4.4 | 8.3 |
| 15 - Manufacture of food products and beverages | 14.5 | 5.4 | 2.0 | 15.4 | 14.4 |
| 16 - Manufacture of tobacco products | | 33.3 | | | |
| 17 - Manufacture of textiles (*) | -2.8 | 6.5 | 94.0 | 6.1 | 8.6 |
| 18 - Manufacture of wearing apparel; dressing and dyeing of fur | | 0.2 | | | 1.1 |
| 19 - Tanning and dressing of leather; manufacture of luggage, handbags, saddler, harness and footwear | 160.1 | 0.0 | -55.0 | 13.3 | 50.0 |
| 20 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials (**) | 26.4 | 0.0 | -3.0 | 3.1 | 0.0 |
| 21 - Manufacture of paper and paper products | 70.3 | 0.0 | 72.0 | 24.4 | 100.0 |
| 22 - Publishing, printing and reproduction of recorded media | 274.5 | 0.0 | | 55.6 | |
| 23 - Manufacture of coke, refined petroleum products and nuclear fuel | | 0.0 | | | 0.0 |
| 24 - Manufacture of chemicals and chemical products | 355.4 | 0.0 | 160.0 | 0.0 | 20.0 |
| 25 - Manufacture of rubber and plastics | -64.6 | 0.0 | 5835.0 | 0.0 | 0.0 |
| 26 - Manufacture of other non-metallic mineral products | 17.4 | 2.7 | 116.0 | 4.5 | 15.5 |
| 27 - Manufacture of basic metals | 134.8 | 0.0 | 44.0 | 6.3 | 0.0 |
| 28 - Manufacture of fabricated metal products, except machinery and equipment | 156.4 | 0.0 | 1.0 | 5.9 | 0.0 |
| 29 - Manufacture of machinery and equipment | 451.8 | 0.0 | -67.0 | 0.0 | 0.0 |
| 30 - Manufacture of office, accounting and computing machinery | | 0.0 | | | |
| 31 - Manufacture of electrical machinery and apparatus (***) | 0.0 | 7.2 | -10.0 | 0.0 | 5.9 |
| 32 - Manufacture of radio, television and communication equipment and apparatus | 82.1 | 0.0 | | 0.0 | |
| 33 - Manufacture of medical, precision and optical instruments, watches and clocks | | 0.0 | | | 0.0 |
| 34 - Manufacture of motor vehicles, trailers and semi-trailers | 89.9 | 0.0 | | 0.0 | |
| 35 - Manufacture of other transport equipment | -10.0 | 0.0 | 166.0 | 0.0 | 2.4 |
| 36 - Manufacture of furniture; manufacturing | | 0.0 | | | 7.7 |
| 40 - Electricity, gas, steam and hot water supply | -40.0 | 0.0 | 1075.0 | 0.0 | 0.0 |
| 72 - Computer and related activities | | 0.0 | | | |
| 74 - Other business activities | 36.7 | 0.6 | -16.0 | 5.7 | 16.7 |
| 75 - Other business activities | 37.7 | 1.6 | -15.0 | 6.7 | 17.7 |
| 93 - Other service activities | 36.6 | 0.0 | | 2.0 | |
| Total (****) | -1.8 | 10.4 | 26.0 | 7.4 | 6.9 |

*Source:* *Calculations based on industry panel data of VLSSs in 1993 and in 1998 and VHLSS in 2002*

*Note:* *(*) 17 - Include manufacture of textiles and 18 - manufacture of wearing apparel; dressing and dyeing of fur (for 1998 data only)*

*(**) 20 - Inculde manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials and 36 - manufacture of furniture; manufacturing n.e.c. (for 1998 data only). Income growth is calculated based on January 1998 prices.*

*(***) 31 - Include manufacture of electrical machinery and apparatus n.e.c., office, accounting and computing machinery, radio, television and communication equipment and apparatus (for 1993 data only)*

*(****) It is calculated based on only NFHEs in the selected industries affected by trade liberalization.*

## Table 2: Fixed-effects Regression Results for Model of Industry Performance

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Group variable (i): industry | | | | Observation per group: | | min = | 1 |
| Number of observations | | = | 133 | | | avg = | 2.5 |
| Number of groups | | = | 53 | | | max = | 3 |
| R-sq: | within | = | 0.0492 | F(1,79) | = | | 4.09 |
| | between | = | 0.0000 | Prob > F | = | | 0.0465 |
| | overall | = | 0.0009 | corr(u_i, Xb) | = | | -0.6290 |

| | Coef. | Std. Err. | t | P>t |
|---|---|---|---|---|
| Openness | 0.164616 | 0.081396 | 2.02 | 0.047 |
| Constant | 8.436007 | 0.139779 | 60.35 | 0.000 |
| sigma_u | 0.691511 | | | |
| sigma_e | 0.802452 | | | |
| rho | 0.426147 | (fraction of variance due to u_i) | | |
| F test that all u_i=0: | | F(52, 79) = 1.04 | Prob > F = 0.4250 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| R-sq: | within | = | 0.0773 | F(1,79) | = | | 6.62 |
| | between | = | 0.0316 | Prob > F | = | | 0.0119 |
| | overall | = | 0.0039 | corr(u_i,Xb) | = | | -0.8494 |

| | Coef. | Std. Err. | t | P>t |
|---|---|---|---|---|
| Tariff | -0.074933 | 0.029119 | -2.57 | 0.012 |
| Constant | 9.352159 | 0.269605 | 34.69 | 0.000 |
| sigma_u | 1.028751 | | | |
| sigma_e | 0.790499 | | | |
| rho | 0.628753 | (fraction of variance due to u_i) | | |
| F test that all u_i=0: | | F(52, 79) = 1.11 | Prob > F = 0.3276 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| R-sq: | within | = | 0.1159 | F(2,78) | = | | 5.11 |
| | between | = | 0.0002 | Prob > F | = | | 0.0082 |
| | overall | = | 0.0027 | corr(u_i, Xb) | = | | -0.8602 |

| | Coef. | Std. Err. | t | P>t |
|---|---|---|---|---|
| Import per GDP | 0.581530 | 0.189231 | 3.07 | 0.003 |
| Export per GDP | -0.217524 | 0.176300 | -1.23 | 0.221 |
| Constant | 8.298769 | 0.146989 | 56.46 | 0.000 |
| sigma_u | 1.047572 | | | |
| sigma_e | 0.778767 | | | |
| rho | 0.644062 | (fraction of variance due to u_i) | | |
| F test that all u_i=0: | | F(52, 78) = 1.22 | Prob > F = 0.2137 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| R-sq: | within | = | 0.1715 | F(3,77) | = | 5.31 |
| | between | = | 0.0000 | Prob > F | = | 0.0022 |
| | overall | = | 0.0026 | corr(u_i, Xb) | = | -0.9009 |

| | Coef. | Std. Err. | t | P>t |
|---|---|---|---|---|
| Openness x Export-oriented industry* | 0.038426 | 0.085695 | 0.45 | 0.655 |
| Openness x Import-substituted industry* | 0.686510 | 0.175379 | 3.91 | 0.000 |
| Openness x Service industry* | 1.731286 | 2.693243 | 0.64 | 0.522 |
| Constant | 8.150653 | 0.172721 | 47.19 | 0.000 |
| sigma_u | 1.345366 | | | |
| sigma_e | 0.758751 | | | |
| rho | 0.758687 | (fraction of variance due to u_i) | | |
| F test that all u_i=0: | | F(52, 77) = 1.38 | Prob > F = 0.0978 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| R-sq: | within | = | 0.1365 | F(3,77) | = | 4.06 |
| | between | = | 0.0632 | Prob > F | = | 0.0099 |
| | overall | = | 0.0041 | corr(u_i, Xb) | = | -0.9358 |

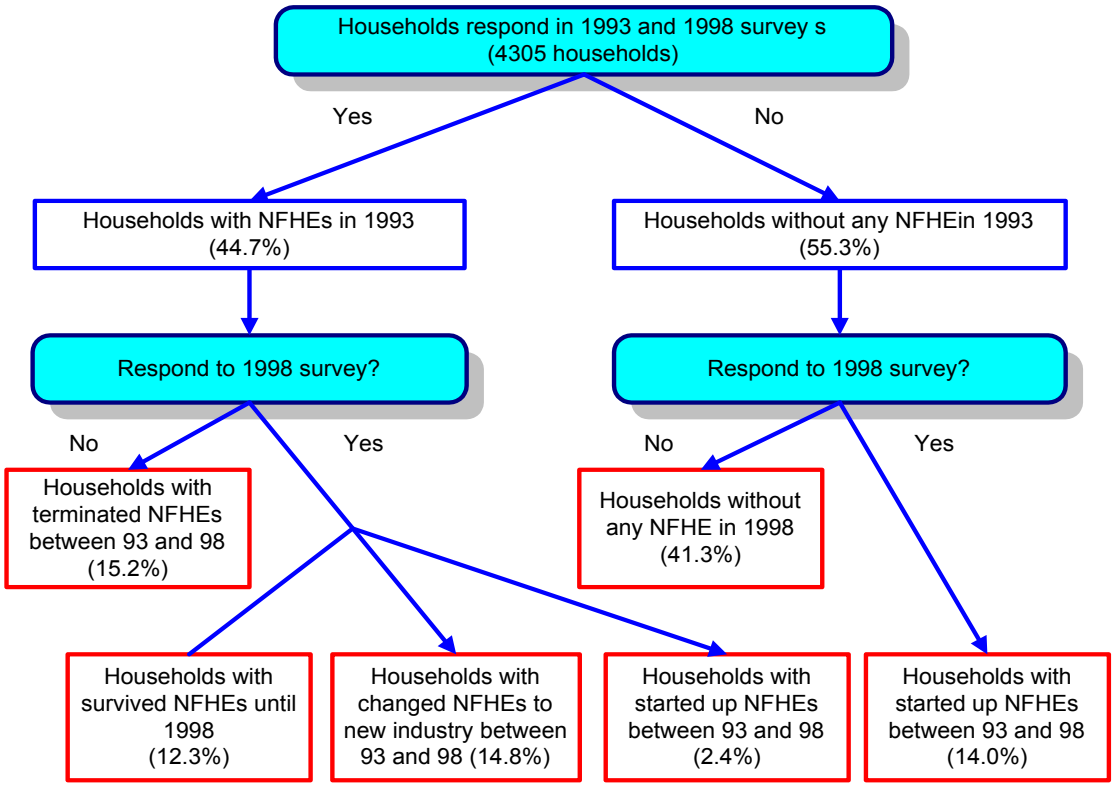
| | Coef. | Std. Err. | t | P>t |
|---|---|---|---|---|
| Tariff x Export-oriented industry* | -0.032938 | 0.035278 | -0.93 | 0.353 |
| Tariff x Import-substituted industry* | -0.177822 | 0.053113 | -3.35 | 0.001 |
| Tariff x Service industry* | -0.036068 | 0.119322 | -0.30 | 0.763 |
| Constant | 9.489985 | 0.288091 | 32.94 | 0.000 |
| sigma_u | 1.821019 | | | |
| sigma_e | 0.774603 | | | |
| rho | 0.846785 | (fraction of variance due to u_i) | | |
| F test that all u_i=0: | | F(52, 77) = 1.25 | Prob > F = 0.1819 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| R-sq: | within | = | 0.2005 | F(6,74) | = | 3.09 |
| | between | = | 0.0001 | Prob > F | = | 0.0093 |
| | overall | = | 0.0091 | corr(u_i, Xb) | = | -0.8592 |

| | Coef. | Std. Err. | t | P>t |
|---|---|---|---|---|
| Import per GDP x Export-oriented industry* | 0.154988 | 0.398745 | 0.39 | 0.699 |
| Import per GDP x Import-substituted industry* | 0.443197 | 0.232233 | 1.91 | 0.060 |
| Import per GDP x Service industry* | 1.358684 | 3.486125 | 0.39 | 0.698 |
| Export per GDP x Export-oriented industry* | -0.033585 | 0.255429 | -0.13 | 0.896 |
| Export per GDP x Import-substituted industry* | 2.477627 | 1.131318 | 2.19 | 0.032 |
| Export per GDP x Service industry* | 3.465027 | 10.617010 | 0.33 | 0.745 |
| Constant | 8.201957 | 0.180938 | 45.33 | 0.000 |
| sigma_u | 1.200764 | | | |
| sigma_e | 0.760300 | | | |
| rho | 0.713818 | (fraction of variance due to u_i) | | |
| F test that all u_i=0: | F(52, 74) = 1.20 | | Prob > F = 0.2383 | |

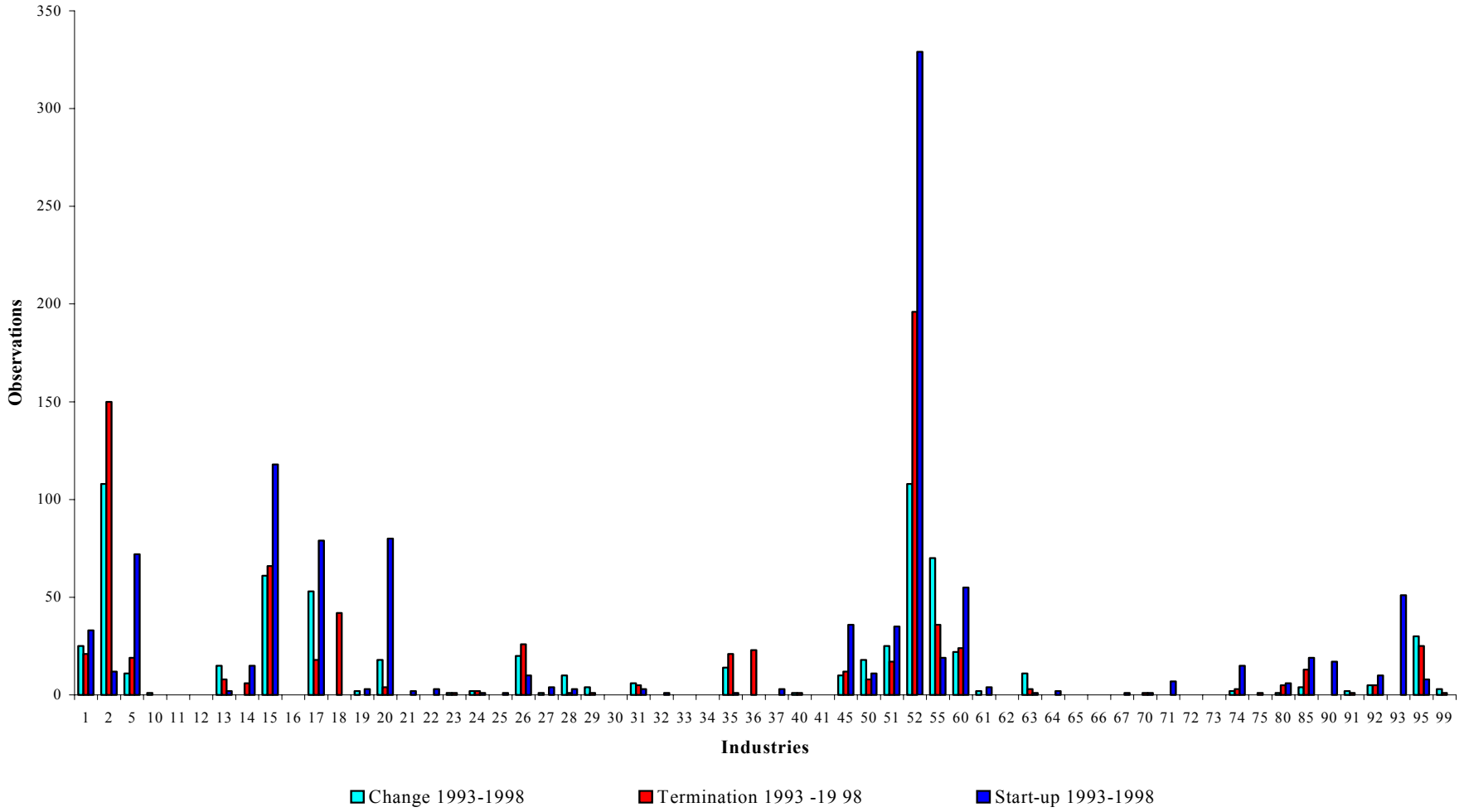
*Source: Calculations based on industry panel data of VLSSs in 1993 and in 1998 and VHLSS in 2002.*
*Note: Dependent variable is Log (annual mean NFHE income in the industry).*
*Hausman specification test shows that a random-effects model of industry performance is rejected.*

**Figure 7: Dynamics of NFHEs, 1993 - 1998**




*Source: Calculations based on panel data of VLSSs in 1993 and in 1998*

**Figure 8: Changed Activities and Outcomes of NFHEs by ISIC Vietnam, 1993 - 1998**




*Source: Calculations based on panel data of VLSSs in 1993 and in 1998*

## Table 3: Performance of NFHEs in Vietnam by Industry in Enterprise Panel Data, 1993-1998 (*)

*(percent, unless otherwise specified)*

| | | 1993 | | 1998 | | 1998-1993 | |
|---|---|---|---|---|---|---|---|
| | Structure | Mean no. of workers | Mean total assets (VND 1,000) | Mean no. of workers | Mean total assets (VND 1,000) | Income growth | Labor productivity increase index |
| 01 - Agriculture services | 4.5 | 3.78 | 9111 | 2.00 | 11428 | -43.5 | 0.7 |
| 02 - Forestry services | 7.5 | 1.60 | 708 | 2.07 | 495 | -0.7 | 0.9 |
| 05 - Fishing | 4.5 | 2.22 | 872 | 2.00 | 5943 | 55.2 | 1.6 |
| 15 - Manufacture of food processing | 35.0 | 2.60 | 6208 | 1.80 | 7989 | 25.7 | 1.6 |
| 17 - Manufacture of textiles and garments | 25.0 | 2.10 | 10809 | 1.66 | 27761 | 112.7 | 1.6 |
| 20 - Manufacture of wood products and furniture | 16.5 | 2.48 | 1870 | 1.91 | 5297 | -24.4 | 1.0 |
| 21 - Manufacture of paper and paper products | 0.5 | 2.00 | 24000 | 5.00 | 65150 | 337.9 | 1.8 |
| 26 - Manufacture of other non-metallic mineral products | 3.0 | 5.33 | 5043 | 5.33 | 11525 | 115.4 | 2.4 |
| 28 - Manufacture of fabricated metal products | 2.5 | 3.00 | 36000 | 2.80 | 7824 | 8.3 | 1.2 |
| 92 - Recreational, cultural and sporting activities | 1.0 | 1.50 | 695 | 1.00 | 258 | 9.8 | 1.5 |
| Total number of observation: (200) | | | | | | | |
| **Total** | 100 | 2.49 | 6864 | 1.96 | 12299 | 29.6 | 1.4 |

*Source: Calculations based on data of VLSSs in 1993 and in 1998*
*Note: (*) Enterprises survived between 1993 and 1998 in panel data*

## Table 4: Relative Risk Ratios for Surviving, Changing and Starting-up Non-farm Household Enterprise, 1993 - 1998

| | | | |
|---|---|---|---|
| Multinomial logistic regression | | Number of obs | 1250 |
| | | Wald chi2(66) | 422.34 |
| | | Prob > chi2 | 0.0000 |
| Log pseudolikelihood | -1391.114 | Pseudo R2 | 0.1648 |

(Outcome terminated enterprise = 2 is the comparison group)

| | | | Survived enterprises = 1 | | | | Changed enterprises = 3 | | | | Started-up enterprises = 4 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Mean** | **Std. Dev.** | RRR | Robust Std. Err. | z | P>\|z\| | RRR | Robust Std. Err. | z | P>\|z\| | RRR | Robust Std. Err. | z | P>\|z\| |
| Female* | 0.20 | 0.40 | 1.00 | 0.258 | 0.00 | 0.997 | 1.28 | 0.356 | 0.88 | 0.377 | 1.10 | 0.245 | 0.42 | 0.674 |
| Age | 47.12 | 12.81 | 0.99 | 0.008 | -0.88 | 0.379 | 0.98 | 0.009 | -2.29 | 0.022 | 0.98 | 0.007 | -2.52 | 0.012 |
| Ln (years of education) | 1.62 | 1.12 | 1.09 | 0.108 | 0.82 | 0.412 | 1.03 | 0.112 | 0.29 | 0.775 | 0.99 | 0.080 | -0.06 | 0.950 |
| Ln (household size) | 1.56 | 0.43 | 2.67 | 0.686 | 3.81 | 0.000 | 3.88 | 1.079 | 4.87 | 0.000 | 2.62 | 0.538 | 4.70 | 0.000 |
| Electricity index | 0.77 | 0.27 | 1.46 | 0.709 | 0.79 | 0.432 | 0.89 | 0.392 | -0.25 | 0.799 | 2.73 | 1.031 | 2.66 | 0.008 |
| Road index | 0.71 | 0.28 | 2.77 | 1.409 | 2.00 | 0.046 | 0.59 | 0.275 | -1.12 | 0.261 | 2.50 | 1.037 | 2.21 | 0.027 |
| Waterway index | 0.26 | 0.43 | 1.55 | 0.540 | 1.26 | 0.207 | 0.60 | 0.234 | -1.30 | 0.194 | 1.03 | 0.302 | 0.12 | 0.907 |
| Local market index | 1.29 | 0.45 | 1.65 | 0.434 | 1.90 | 0.057 | 1.27 | 0.342 | 0.87 | 0.384 | 0.84 | 0.186 | -0.80 | 0.422 |
| Factory* | 0.64 | 0.48 | 0.99 | 0.222 | -0.06 | 0.949 | 1.12 | 0.252 | 0.50 | 0.620 | 0.88 | 0.166 | -0.71 | 0.481 |
| Handicraft* | 0.32 | 0.47 | 1.69 | 0.337 | 2.61 | 0.009 | 1.11 | 0.242 | 0.49 | 0.624 | 1.10 | 0.201 | 0.51 | 0.613 |
| Enterprise in import industry* | 0.08 | 0.27 | 0.31 | 0.189 | -1.92 | 0.055 | 0.04 | 0.027 | -4.91 | 0.000 | 0.05 | 0.029 | -5.23 | 0.000 |
| Enterprise in other industry* | 0.24 | 0.43 | 0.16 | 0.117 | -2.51 | 0.012 | 0.00 | 0.001 | -8.07 | 0.000 | 0.01 | 0.007 | -6.82 | 0.000 |
| Ln ((import97+import98)/2) | 4.44 | 2.27 | 0.98 | 0.103 | -0.20 | 0.842 | 0.97 | 0.131 | -0.19 | 0.847 | 1.02 | 0.110 | 0.16 | 0.869 |
| Ln ((export97+export98)/2) | 5.01 | 2.59 | 0.92 | 0.147 | -0.49 | 0.623 | 0.39 | 0.077 | -4.78 | 0.000 | 0.52 | 0.084 | -4.05 | 0.000 |
| Weighted tariff 1998 | 22.14 | 10.66 | 1.03 | 0.017 | 2.01 | 0.044 | 1.00 | 0.018 | -0.03 | 0.977 | 1.02 | 0.015 | 1.60 | 0.109 |
| North East* | 0.18 | 0.38 | 1.04 | 0.331 | 0.13 | 0.895 | 0.37 | 0.142 | -2.58 | 0.010 | 1.26 | 0.341 | 0.84 | 0.399 |
| North West* | 0.04 | 0.19 | 1.20 | 0.820 | 0.27 | 0.788 | 5.17 | 2.459 | 3.45 | 0.001 | 0.82 | 0.429 | -0.38 | 0.704 |
| North Central Coast* | 0.19 | 0.39 | 2.62 | 0.891 | 2.82 | 0.005 | 2.45 | 0.837 | 2.62 | 0.009 | 3.64 | 1.092 | 4.32 | 0.000 |
| South Central Coast* | 0.06 | 0.24 | 1.22 | 0.484 | 0.49 | 0.624 | 0.99 | 0.451 | -0.01 | 0.991 | 1.37 | 0.506 | 0.85 | 0.394 |
| Central Highlands* | 0.01 | 0.09 | 0.55 | 0.699 | -0.47 | 0.637 | 0.36 | 0.374 | -0.98 | 0.326 | 0.81 | 0.677 | -0.25 | 0.801 |
| South East* | 0.10 | 0.31 | 1.24 | 0.454 | 0.58 | 0.564 | 1.03 | 0.386 | 0.09 | 0.930 | 0.89 | 0.293 | -0.36 | 0.721 |
| Mekong Delta* | 0.21 | 0.41 | 0.48 | 0.182 | -1.93 | 0.054 | 0.60 | 0.234 | -1.31 | 0.189 | 0.61 | 0.186 | -1.63 | 0.103 |

*Source: Calculations based on panel data of VLSSs in 1993 and in 1998*