Export markets, employment, and formal jobs:

Evidence from the U.S.-Vietnam Bilateral Trade Agreement[1]

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Abstract

This paper examines the effects of the U.S.-Vietnam Bilateral Trade Agreement (BTA) on the allocation of employment across firms within an industry in Vietnam. Unlike existing literature, we study this question in a setting that includes employment in small, informal firms and larger, more formal firms. Vietnam experienced a large decline in informal employment during this period. We show that a large portion of this decline in informality is driven by reallocation of labor from less to more formal firms within industries. This within-industry component is particularly pronounced in a sample that excludes agriculture and aquaculture and in urban areas. When we relate these within-industry changes in informal employment to industry tariff cuts, we find that the probability of working informally declined most in industries that faced the largest U.S. tariff cuts induced by the BTA. This evidence suggests that the BTA contributed toward the within-industry reallocation of employment from jobs in smaller, more informal establishments toward larger, more formal firms. This latter finding confirms the predictions of Melitz-style models, which suggest that new export opportunities should lead to expansion of larger, usually more "formal" firms.

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1. Introduction

Improving market access of exports from poor countries to rich countries is a key component of the current Doha WTO negotiation round and many bilateral and regional free trade agreements. Recent models of trade with heterogeneous firms, such as Melitz (2003), would suggest that within an industry, new exporting opportunities will expand the output in initially bigger, better performing firms and contract output in initially smaller, less efficient firms. This implies that the new export opportunities would lead to reallocation of labor from smaller to larger firms within industries. Empirically, however, little is known about how individuals employed in smaller, often informal firms respond to new exporting opportunities and whether such reallocation takes place. This is potentially an important omission given that many of the poorest individuals rely on employment in household businesses as their main source of income (Baneerjee and Duflo (2007)).

Given this state of affairs, our goal is to examine the consequences of increased market demand for employment and smaller, more informal firms in a developing country. In particular, we study the consequences of a plausibly exogenous increase in market demand induced by the 2001 U.S.-Vietnam Bilateral Trade Agreement (BTA). We investigate changes in the composition of employment and the informal sector brought about by the BTA in Vietnam.

Our project makes several contributions. Although there is a large literature on informality, the concept, its determinants, and ultimately its consequences are not yet well understood. This state of affairs reflects several challenges. One of the biggest challenges is that the informal sector is often not well represented in the usual data sources. To the extent that informal workers or firms are included in these sources, they often cannot be identified because of lack of information on the type of job or benefits they receive. A second challenge is that to the extent information on informality exists, it often does not exist over multiple years, so that one cannot trace changes in informality over time. Panel data on firms and/or individuals is key to better understanding of the informal sector. Take, for example, the relationship between informality and worker productivity/wages. In a setting where individuals are heterogeneous, cross-sectional data does not provide sufficient information to convincingly distinguish whether observed differences in wages across workers in formal and informal sector

reflect selection of inherently better workers into the formal sector or whether these wage differences are caused by participation in the formal sector. A third challenge is that when data on informality do exist over multiple years, often they do not coincide with policy changes. This substantially hinders the researcher's ability to evaluate the effects of policy changes on the informal sector.

Our study examines the consequence of a policy-induced change in market demand for the reallocation of labor between smaller, more informal establishments toward and larger, more formal firms in Vietnam. We use detailed micro- panel data on households and workers that are well suited to study informality and span the period of a plausibly exogenous increase in market demand induced by new export opportunities through the 2001 BTA. The BTA was signed on 13 July 2000 and came into force on 10 December 2001. Since the implementation, Vietnamese exports to the U.S. have grown very rapidly. From 2001 to 2002, Vietnamese exports to the U.S. grew by 128 percent followed by an additional 90 percent from 2002 to 2003. By 2004, the General Statistics Office (GSO) of Vietnam estimates exports to the U.S. accounted for 20.2 percent of Vietnam's total exports or about 13 percent of GDP. Hence, the growth in exports to the U.S. represents a sudden and substantial shock to Vietnam's economy.

We propose to link the BTA to informality using the 2002, 2004 and 2006 Vietnam Household Living Standards Surveys (VHLSS). The three VHLSS surveys contain individual- and household-level panel datasets that allow one to study transitions into and out of informality and to control for unobserved heterogeneity related to selection into informality. This is seldom done in the existing literature, thereby limiting the questions that can be credibly addressed. A second advantage is that the questionnaires collected information on self-employed individuals, not just those working for others. This allows us to track movements out of informal self-employment into formal wage employment, something which most existing studies are unable to do. It is especially important to be able to examine informal self-employment in very poor countries, such as Vietnam, where a very large share of the workforce is informally self-employed in agriculture or a small household business.

Our analysis so far yields several interesting findings. Vietnam experienced a large decline in informal employment during this period. We show that a large portion of this decline

in informality is driven by reallocation of labor from less to more formal firms within industries. This within-industry component is particularly pronounced in a sample that excludes agriculture and aquaculture and in urban areas. We next examine whether the BTA contributed to the observed decline in employment in the informal sectors during this period in Vietnam. We find that the probability of working for a household business declined most in industries that experienced the largest U.S. tariff cuts. This evidence suggests that the BTA contributed toward the within-industry reallocation of employment from household businesses toward larger, more formal firms. This latter finding confirms the predictions of Melitz-style models, which suggest that new export opportunities should lead to expansion of larger, usually more "formal" firms.

Section 2 summarizes existing literature and relevant theoretical work which provides us with a framework in which to analyze the impacts of changes in trade policy on reallocation of labor across industries and from less to more formal firms within industries. In section 3, we provide a detailed description of the BTA and describe the individual and household level data in section 4. Section 5 defines informality and section 6 decomposes aggregate changes in informality into within and between industry components that are emphasized in the theory framework. Section 7 focuses on the effects of BTA on allocation of employment across heterogeneous firms and the regression analysis that relates changes in informality to BTA-induced tariff cuts. Section 8 concludes.

2. Existing literature on trade and informality and theory framework

The literature on the effect of trade policy in a setting with a large informal employment is very small (see Harrison and Leamer (1996), Goldberg and Pavcnik (2007) for survey). The existing literature usually focuses on the idea that trade liberalization will increase informality because foreign competition forces firms to cut costs, which they do, in part, by employing a higher proportion of informal workers. Goldberg and Pavcnik (2003), for example, present a model that formalizes this idea and shows that under certain theoretical assumptions, firms within an industry may find it optimal to hire relatively more informal workers after a unilateral trade liberalization that leads to a permanent decline in industry tariffs. The empirical evidence on the link between informality and trade reform is scarce, due to the lack of data on

informality and the labour market regulation compliance of firms. In addition the evidence so far focuses on the responses to the unilateral trade liberalization. The existing studies generate mixed results. Currie and Harrison (1997) document that subsequent to trade reforms, firms in Morocco increase the use of temporary workers, which are not entitled to benefits. Goldberg and Pavcnik (2003), in a study that focuses on Brazil and Colombia, find that the association between within-industry tariff changes and probability of employment in the informal sector varies across countries and time and seems to be related more to the flexibility of the labour market than to trade policies.

Unlike earlier work, our paper examines the allocation of labor between formal and informal jobs in response to increased export market access. We consequently frame our empirical analysis to incorporate the insights of the recent literature on trade and heterogeneous firms. In particular, a reduction in industry tariffs on Vietnamese exports could influence the composition of employment between smaller, less formal firms and larger, more formal firms in Vietnam through two channels: 1) within industry changes and 2) between industry changes.

First, a reduction in industry tariffs on Vietnamese exports to the United States will increase demand for Vietnamese products and induce an increase in labor demand in that industry. The increase in the industry product and labor demand will likely not be equally distributed across firms within in industry. More specifically, Melitz (2003) develops a model where firms differ in underlying performance and face a fixed cost of accessing export markets. In this setting, only some firms export and these tend to be initially more productive firms that are profitable enough to cover the fixed cost of exporting. The model generates several predictions for how increased access to an export market (due to a decline in a foreign tariff) affects firm survival, output, and employment. First, an increase in market access will lead to an increase in industry demand. However, only initially better firms benefit from this expansion because they are the ones profitable enough to cover the fixed cost of exporting. Thus, sales and employment in the initially better firms expand due to increased export demand. This expansion occurs by increased output and employment in existing exporters and entry of firms into the export market (i.e., new exporters). Second, the expansion of better firms due to new

exporting opportunities increases industry-wide wages (Melitz (2003)) and the intensity of competition (Melitz and Ottaviano (2008)). Consequently, some less efficient firms that only serve the domestic market observe a contraction in output and employment. In fact, the most inefficient firms no longer earn sufficient profits to cover fixed cost of production, so that increased export opportunities lead the least efficient firms to exit the industry.

These models create clear predictions that within an industry, trade will expand the employment in initially bigger, better performing firms and contract employment in initially inefficient firms. While the original formulation in Melitz (2003) does not allow for differences in employment conditions and wages across firms within an industry, several follow-up studies show that initially better performing firms tend to pay higher wages, for example due to efficiency wage (Verhoogen (2008), Davis and Harrigan (2007)), and that increased market access expands the employment and wages paid in initially better-performing firms (Verhoogen (2008)). To the extent that better performing firms offer better employment opportunities, higher wages, and pass some of the higher productivity to worker wages, the abovementioned models predict that increased access to exporting opportunities should expand the availability of better, more formal jobs.[2]

The discussion so far has focused on a single industry. However, the BTA increased market access across several industries. Models of trade based on comparative advantage emphasize the influence of international trade for resource allocation across industries through trade-induced changes in relative industry prices. In general equilibrium, the effects of trade policy on informality could potentially differ, as workers move into industries that experienced greater increases in foreign market access (i.e., large foreign tariff cuts) and away from industries that are less affected by cuts in foreign tariffs. If the expanding industries are industries that typically employ a larger share of formal workers, then it is possible that trade liberalization would lead to an increase of formal employment in the aggregate. Vice versa, if the workers move towards industries employing more informal workers (e.g., agriculture), one

[2] Existing literature (Marcouiller, Ruiz de Castilla, and Woodruff (1997), Goldberg and Pavcnik (2003), Pavcnik et al. (2004)), in fact, finds that workers working in the informal sector or establishments earn lower wages than observationally equivalent workers in the formal sector. They are also less likely to receive benefits. However, one should keep in mind that workers might select to work in the informal sector because they value flexibility in work arrangements available in this sector.

would observe an increase in informality, which, however, would be driven by labor re-allocation across industries rather than the mechanism outlined above. For example, suppose that employment in agriculture tends to be relatively more "informal" than employment in apparel. If trade liberalization increases the relative demand for apparel, the expansion of the apparel sector will increase the number of "formal" jobs in the economy. However, if trade liberalization increases the relative demand for agriculture, the number of "informal" jobs in the economy could increase. This example illustrates that, more generally, the total effect of trade on informality through the between industry channel depends on the nature of the trade liberalization in question and the relative informality of the industries subject to the biggest reductions in foreign tariffs.

The above discussion of within- and between- industry channels through which increased export opportunities affect labor allocation between formal and informal jobs provides guidance for our empirical analysis in section 6 and 7. In section 6 we examine changes in informality in Vietnam and decompose them into those stemming from within-industry and between-industry reallocation of labor to evaluate their relative importance for explaining the aggregate changes in informality. In section 7 we examine how these tariff cuts affected reallocation of jobs across heterogeneous firms within Vietnamese industries.

3. Description of U.S.-Vietnam Bilateral Trade Agreement and Trade Data[3]

The study will combine detailed information on changes in trade policy with micro-level data that span the period of trade reform. In this section we describe the U.S.-Vietnam Bilateral Trade Agreement and discuss the trade data.

The BTA was signed on 13 July 2000 and came into force on 10 December 2001. The commitments made by the United States and Vietnam are similar to those required by the World Trade Organization (WTO). As such, the principal change for the U.S. was to grant Vietnam Normal Trade Relations (NTR) or Most Favored Nation (MFN) access to the U.S. market immediately upon entry into force of the BTA.

[3] This section draws heavily on the STAR-Vietnam report "An Assessment of the Economic Impact of the United States – Vietnam Bilateral Trade Agreement" and its initial part is taken from McCaig (forthcoming). This section is the same as the description of the BTA in the companion paper by McCaig and Pavcnik (2011).

We have access to detailed information on these U.S. tariffs from the U.S. International Trade Commission's online Tariff Information Center. Prior to the BTA Vietnam was subject to tariffs according to Column 2 of the U.S. tariff schedule. Upon entry into force of the BTA, Vietnam became subject to MFN tariff rates. For both tariff schedules McCaig (forthcoming) computes the ad valorem equivalent of any specific tariffs. He then matches the tariff lines to industries by the concordance provided by the World Bank via the World Integrated Trade Solution database to construct industry-level tariffs according to ISIC nomenclature.

A preliminary analysis of this data highlights the advantage of studying the relationship between market access and employment in the context of BTA. The magnitude of the tariff cuts across industries is summarized in Table 1. The table provides information on aggregate tariffs and industry-specific tariff declines. First, the BTA on average reduced tariffs by 23.4 percentage points. These are substantially bigger tariff cuts than those that have been the focus in previous work on the consequences of increased market access such as Bustos (2011) and Iacovone and Javorcik (2008). This improves our ability to separate the changes in tariffs from other confounding changes in the Vietnamese economy. A second useful feature of the BTA is that tariff cuts were not uniform across sectors. The BTA reduced tariffs on Vietnamese goods in agriculture, fishing, mining, and manufacturing. The tariff cuts were largest in manufacturing where the average ad valorem equivalent tariff dropped from 31.5 to 3.3 percent. The average ad valorem tariff also fell substantially within agriculture, hunting, and forestry as it was cut from 10.6 to 3.2 percent. In contrast, the tariff cuts within both fishing and mining were much smaller, 1.1 and 2.6 percentage points respectively. This enables us to exploit differential changes in tariff rates across sectors to identify the effects of increased market access on outcomes of interest.

One concern with this approach is that the differences in the degree of industry tariff cuts across sectors reflect differing abilities of industry special interest groups in Vietnam and the U.S. to influence tariff formation. This is clearly not the case and a third advantage of the BTA is that the concern about the political economy of protection and the endogeneity of tariff changes are less severe. Industry-specific tariff cuts were not a result of specific U.S.-Vietnam bilateral negotiations, but they occurred by the U.S. granting Vietnam the status of Normal

Trade Relations (or Most Favored Nation status). The U.S. tariff cuts were presented as an all-or-nothing package whereby exports from Vietnam into the U.S. would immediately be covered by MFN tariff rates instead of Column 2 tariff rates. The movement from one pre-existing tariff schedule to a second pre-existing tariff schedule implies that both U.S. and Vietnamese industries did not have an opportunity to influence the tariff cuts faced by their industry.

This argument relies on the assumption that both the Column 2 and MFN tariff schedules are exogenous to Vietnam, which we turn to now. The Column 2 tariff rates are arguably exogenous to Vietnam for a number of reasons, summarized in McCaig (forthcoming). First, the countries subject to Column 2 rates are all former or current communist countries, suggesting that political concerns larger than industry lobbying dominate this category of the U.S. tariff schedule. Second, imports into the U.S. under Column 2 constitute a very small fraction of overall U.S. imports. Between 1996 and 2006, the share of total U.S. imports originating in countries subject to Column 2 rates never exceeded 0.09 percent. This implies that the returns to U.S. industries lobbying for protection are very low within the Column 2 section of the U.S. tariff schedule. Third, as suggested by the previous point, both prior and subsequent to the BTA, there has been little change in the prevailing Column 2 rates. Between 1997 and 2005, the correlation of Column 2 rates was 0.978. Clearly the Column 2 rates have been very stable and much more so than the MFN rates. These three arguments support the proposition that the Column 2 rates prevailing in 2001 were exogenous to Vietnam. The major argument for the exogeneity of the *ex-post* level of U.S. protection is that overall imports from Vietnam into the U.S. represent a very small fraction of total U.S. imports. By 2006, U.S. imports from Vietnam constituted only 0.46 percent of total U.S. imports. Hence, it is hard to believe that the U.S. would set its trade protection structure based on conditions in Vietnam.

The BTA has had a significant impact on the volume and structure of Vietnamese exports. During this period, Vietnam's aggregate exports were expanding world-wide, but the share of exports to the U.S. grew even more. From 2001 to 2002, Vietnamese exports to the U.S. grew by 128 percent followed by an additional 90 percent from 2002 to 2003. By 2004, the General Statistics Office (GSO) of Vietnam estimates exports to the U.S. accounted for 20.2

percent of Vietnam's total exports or about 13 percent of GDP.[4] By comparison, in 2000, exports to the U.S. represented only 5.1 percent of total exports or 2.8 percent of GDP. Hence, the growth in exports to the U.S. represents a sudden and substantial shock to Vietnam's economy.

At a more disaggregated level, exports soared in the 2-digit SITC categories of articles of apparel and clothing accessories. This commodity category showed an annual growth of 276.5 percent from 2001 to 2004. Table 2 presents information on value, growth, and share of exports for Vietnam's top seven commodity exports to the U.S. according to 2004 value. With the exception of petroleum products, Vietnam's top seven exports to the U.S. are all commodities that intensively use low-skilled labor. This suggests the potential for the increase in exports to influence the prevalence of informal employment as unskilled workers are more likely to work in household businesses than skilled workers.

4. Description of individual-level and household-level data

4.1 Data Description

We use the Vietnam Household Living Standards Surveys (VHLSS) that were conducted by the General Statistics Office (GSO) of Vietnam in 2002, 2004, and 2006. Each survey contained modules related to household demographics, education, health, employment, income generating activities, including household businesses, and expenditures. Each survey was designed to be nationally representative, both within rural and urban areas and for the country as a whole. Table 3 reports the total number of households available in the datasets for each survey, as well as within urban and rural areas. Table 3 makes it immediately obvious that Vietnam is a predominantly rural country. Over two thirds of households live in rural areas. This is one feature of the datasets that distinguishes our work relative to most of the existing literature – we study informality within both urban and rural areas, as opposed to urban areas only, as is common in the existing literature.

Another advantage of these surveys is the existence of various panels. The data contains a rotating panel component within the three VHLSSs. There is a household panel between the 2002 and 2004 VHLSS, there is a household panel between the 2004 and 2006 VHLSSs, and

[4] According to the GSO, exports of goods and services in 2004 were 65.74 percent of GDP.

finally there is a three-period household panel stretching across the 2002, 2004 and 2006 VHLSSs. The panels allow us to study transitions into and out of different types of employment and to control for unobserved heterogeneity related to selection into these businesses and job types.

The employment modules collect information on the industry of employment, the occupation of the individual, the sector in which the individual worked (e.g., foreign sector, state sector, etc.), the amount of time spent working in that job over the past 12 months, the value of wage or salary payments, and the value of non-wage/salary payments. A key feature of the employment modules is that the collected information covers *all* workers, regardless of industry. This allows us to look at informal employment more broadly than many of the papers in the literature that focus solely on informal employment in manufacturing activities. A second advantage is that the modules collected information on self-employed individuals, not just those working for others. This allows us to track movements out of informal self-employment into formal wage employment, something which most existing studies are unable to do. It is especially important to be able to examine informal self-employment in very poor countries, such as Vietnam, where a very large share of the workforce is informally self-employed in agriculture or a small household business.

4.2 Descriptive Statistics on Vietnamese Labor Force

We next provide an overview of the data that we will be using in the analysis. We begin by analyzing some of the aggregate employment trends using the household surveys, followed by summarizing the reporting of non-wage/salary payments and benefits received by employees in Tables 4 through 6. In each of these tables we restrict the analysis to the main job of individuals aged 15 to 65 inclusive, and all values reported are adjusted by sampling weights.

Table 4 summarizes the distribution of workers by occupation for the 2002, 2004 and 2006. The most noticeable feature of the results is that a large majority of respondents indicate working in an unskilled profession. However, the percentage has been falling from 73.9 percent in 2002 to 71 percent in 2006. It is unclear at this point whether the decline is due to unskilled workers moving into skilled jobs or due to new skilled workers entering the labour force and changing the composition of the labour force. The primary growth area has been the category

of “skilled handicraftsmen and other relating skilled manual workers”. This could perhaps be partially due to the growth in manufacturing jobs that accompanied the BTA, but this remains to be verified.

Table 5 displays the share of workers that were self-employed and the share of workers working within the private, state, and foreign sectors over the course of the specified time period. [5] In the next section, we rely on this information to measure informality. The top of the table focuses on Vietnam as a whole. Table 5 illustrates that self-employment is the largest sector of employment. Table 5 also demonstrates that the second largest sector of employment, for most of the surveys, was the private sector. The growth of the private sector over time has been the primary source of jobs for individuals leaving self-employment and hence a key source of employment in the context of formal employment. Finally, the share of employment in the state sector is a significant source of employment.

The second and third panels of Table 5 show the results by rural and urban Vietnam separately. None of the results found are particularly surprising results. The share of self-employment is higher in rural areas than urban, consistent with the large share of the rural population working on their own household farms. The foreign sector is much larger in urban areas than in rural, as are the domestic private and state sectors. Despite these expected differences between rural and urban areas, Table 5 helps to demonstrate the value of having information on rural individuals. The vast majority of rural workers are involved in informal self-employment. Failing to cover this segment of the population would mean ignoring a large share of informal workers.

Our measure of informality will also rely on information about non-wage/salary payments for employees that work in more formal establishments. The top panel of Table 6 shows the share of individuals that reported receiving a positive payment for holidays, social allowance, business trips, other forms of non-wage/salary payments, and any non-wage/salary payment for the three VHLSSs for all workers that are not self-employed. The remaining panels of Table 6 show the share of employees who indicate various benefits in different types of establishments (i.e. ownership sectors). The top of Table 6 indicates that the share of

[5] The middle and right part of the table provide similar statistics for the individuals in 2002 and 2004, and 2002 and 2006 panels, respectively.

employees receiving any kind of benefit payment has risen from 56.5% in 2002 to 62.3% in 2006. Most of this increase is due to a larger share of employees reporting payments for Tet or other public holidays and a larger share of employees reporting "other" non-wage/salary payments. Thus, we see a rise in the share of employees that obtain non-wage benefits, which are usually considered an indication of a more formal job. The remaining part of the table examines these patterns for different types of employment. It clearly shows that individuals that work for other households are the least likely to obtain non-wage benefits. Other employer types are more likely to provide these benefits in the increasing of generosity: the collective sector, private sector, foreign sector, and the state sector. This evidence on non-wage benefits thus confirms that being self-employed (either in a household farm or household business) or working for another household is associated with lower non-wage benefits and provides support for our measures of informality in the next section.

The above discussion focused on workers working for different types of employers and the benefits associated with such employment arrangements. An important component of our analysis in subsequent sections focuses on the mobility of workers across different sectors and across types of employers. The panel data enables are to examine such mobility and transitions of workers across broad sectors and employer types during our sample. To obtain a preliminary look at the degree of the mobility in Vietnam along the dimensions suggested by the theory discussion in Section 2, we use information from a panel of individuals between 2002 and 2004 and examine transitions of workers across broad sectors of the economy (i.e., primary, secondary, and tertiary sector) and across types of employers (i.e., self-employed, work for other household, work for private firm, work for state-owned firm, work for foreign firm) and in this two year period.

Table 7 summarizes transitions between various employment outcomes and suggests relatively high mobility in both of these dimensions in a short window of time. Out of 10 370 respondents, 75.7 percent of individuals report working in the same sector in 2004 as in 2002, meaning that 24.3 percent moved between the primary, secondary, and tertiary sectors in only 2 years. About 6.4 percent of workers moved out of the primary sector and into either the secondary or tertiary sector. This does not reveal any movements within these broad industrial

sectors, say from one manufacturing industry to another, that we will exploit in the decomposition in subsequent work below. Mobility across employer types is also notable. 77.5 percent of individuals report working in the same type of establishment in 2004 as in 2002. This implies that 22.5 percent of individuals changed the type of establishment they worked for in only 2 years. These numbers seem to suggest that Vietnam's labour markets are relatively fluid. This preliminary analysis suggests that there is scope for within and between industry movements to influence the structure of employment and the size of the formal sectors by reallocation of workers across firms with different degree of formality and across industries with different degrees of formality as discussed in section 2. Further, given that primary, secondary, and tertiary activities also likely differ in the degree of informality, these preliminary statistics suggest that aggregate changes in the formality of jobs might reflect both within and between industry movements.

5. Defining informality

Informality is a complex and multi-dimensional concept, so it is not surprising that the definition of informality varies across studies. The informal sector is usually defined as the segment of the economy that is either not covered or does not comply with labor market regulations such as minimum wage or minimum working age laws, and is associated with lower pay and inferior working conditions. Studies thus often define informality based on criteria such as firm size (for example, firms with less than 10 employees are assigned to the informal sector), self-employment status (for example, in many countries self-employed are not subject to labor market regulation), or compliance with labor market regulation (for example, workers that do not receive benefits required by labor market regulation from their employers are considered informal), and hours of work (for example, part-time workers are assigned to the informal sector).

Given the multi-dimensionality of informality, we would like to emphasize that our definition of informality is not confined to one particular criterion, but instead considers several dimensions of the concept. The breadth of data available through the household surveys provides us with several ways to define informality.

At the individual level we can define informality in a number of ways. The employment modules collect information on the industry of employment, the occupation of the individual, the sector in which the individual worked (e.g., foreign sector, state sector, etc.), the amount of time spent working in that job over the past 12 months, the value of wage or salary payments, and the value of non-wage/salary payments. A key feature of the employment modules is that the collected information covers *all* workers, regardless of industry.

To start, we will rely on the question that asks individuals about the type of establishment they work for (i.e., "ownership sector"). As described in section 4, this question distinguished between self-employment (we can separate also work on a household farm from work in a household business) and work for wages in: 1) other households, 2) the state sector, 3) the private sector, or 4) the foreign sector. Using this information, we can define informal employment as being equivalent to self-employment. Self-employed individuals will not be covered by formal employment characteristics such as sick leave, maternity benefits, or pensions and their income can be extremely vulnerable to negative shocks, such as natural disasters destroying crops. Thus, our first definition of informality is equivalent to being self-employed.

Our second definition of informality expands upon the first to include individuals that work for wages for other households. As described previously, many of these household businesses are very small and operate informally. A minority of them operate with a license. Therefore, relative to wage workers in the state, private or foreign sectors, it is less likely that these individuals would be covered by a contract or to receive benefits from their employer. The information on benefits across different types of employers discussed in section 4.2 confirms this.

Finally, our third definition of informality expands on the second to include wage workers in the state, private, or foreign sector that did not report receiving any benefits from their employer. Jobs with benefits tend to be viewed as more formal and better jobs. This dimension might be more closely related with the compliance of firms with the labour code. Starting in 1995, the Vietnam Social Insurance Agency covered employees of state-owned enterprises, employees of private enterprises with 10 or more employees, all foreign invested

firms, government administrative employees, and party employees. The benefits were to include pension, sickness, maternity, and worker's compensation, with contributions coming from both the employer and employee as a percentage of the salary.

For wage workers the VHLSS questionnaires asked about payments, either cash or in-kind, received for public holidays, social allowances (illness, maternity, workplace accidents), business trips, and other reasons. In particular, the VHLSS asked each employed individual about payments for Tet (the Vietnamese New Year) or other holidays, social subsidy payments (including illness, maternity, or workplace accident), travel allowances, and other payments. Hence, we define a wage worker in these sectors as informal if they received no payments for any of these reasons.

Thus, we have three ranked definitions of informality: self-employed, self-employed plus working for other households, and self-employed, working for other households, and working for wages without reported benefits. These multiple definitions give us a scope and flexibility not often available to other researchers and allow us to check the robustness of our results to the particular definition used (see Goldberg and Pavcnik (2007)) for review of this literature).

Table 8 presents estimates of the size of the informal sector in Vietnam between 2002 and 2006 using these three definitions. The left panel focuses on economy-wide figures, the middle panel excludes agriculture and fisheries, while the third panel only focuses on manufacturing industries. The table also presents the figure for Vietnam as a whole, urban areas, and rural areas. The major fact to emerge is that informality is very high in Vietnam. Across all industries between 66 and 70 percent of workers are informal according to our most restrictive definition of informality, self-employment. Not surprisingly, as the definition of informality expands the share of informal workers increases. According to our broadest definition of informality between 84 and 87 percent of workers were informal. For all three definitions the share of informal workers is higher in rural areas than urban, in large part due to the high degree of self-employment in agriculture and aquaculture in rural areas. Excluding agriculture and aquaculture the share of informal workers is still quite high, ranging from 44 to 71 percent in 2002, depending on the definition of informality. We see similarly high levels of

informality within manufacturing, with estimates ranging from 39 to 70 percent in 2002. Thus, it is clear that even in manufacturing, where most of the existing work on labor reallocation is done, the usual focus on formal firms only captures a small share of employment.

The second key fact to emerge from Table 8 is that informality fell between 2002 and 2006. This pattern holds across each definition of informality, urban and rural areas, excluding agriculture and aquaculture, and within manufacturing. Our overall estimates suggest a fall in the share of informal workers of between 3.1 and 4.2 percentage points (or 3.5 and 5.9 percent) nationally. In the next section we explore whether these decreases came mostly from within or between industry changes.

6. Within and between industry changes in informality

The descriptive statistics on informality reported in Section 5 suggest that the share of more formal employment has increased between 2002 and 2006 for all three definitions of informality. The question naturally arises whether these aggregate changes can in part be driven by expanded export opportunities. The theory framework in Section 2 emphasizes that trade can influence the availability of more formal jobs through reallocation of employment within an industry and between industries that differ in their level of "formality". To examine this further, we first determine the relative importance of between and within industry channels for the composition of employment across the formal and informal firms. The first step in our analysis thus addresses whether these observed aggregate changes in informality stem from changes in the composition of industry employment (e.g., trade liberalization may have expanded the employment in industries that employ a proportionally larger share of informal workers that work for household businesses) or from within-industry changes in informal employment (e.g., within an industry, workers move from informal jobs to more formal jobs, perhaps by changing the type of establishment they work in).

To this end, we decompose the change in the share of informal workers in total employment between 2002 and 2006 ΔI into within and between industry shifts, respectively:

$$\Delta I_t = I_t - I_\tau = \sum_j \Delta i_{jt} E_{j.} + \sum_j \Delta E_{jt} i_{j.}, \qquad (4)$$

where E_{jt} is the share of industry j's employment in total employment at time t, i_{jt} is the share of informal workers in total employment in industry j, $E_{j.} = .5(E_{jt} + E_{j\tau})$, and $i_{j.} = .5(i_{jt} + i_{j\tau})$. This

decomposition will provide evidence on the relative importance of mobility of workers across the formal and informal sectors *within* an industry and mobility of workers *across* industries as sources of changes in informality. Note that a similar decomposition has often been used in the literature on skill-upgrading to decompose the change in the share of skilled workers between and within industries.

Table 9 presents the results of the decomposition according to equation 4. Let us focus on changes between 2002 and 2006. When using workers across all industries it is generally the case that between industry changes accounted for a greater share of the decrease in overall informality than within industry changes. For example, using our first definition of informality, self-employment, the between industry component accounted for 72 percent of the decrease in informality between 2002 and 2006. This is driven entirely by the movement of labor away from self-employed agriculture. In addition, the dominance of the between-industry changes is mainly driven by rural areas. As the middle panel of the table suggests, in urban areas the within industry component is generally larger than the between industry component. A major reason for the discrepancy between urban and rural areas is the large reduction in the share of workers in agriculture and aquaculture, which intensively rely on informal employment and is concentrated in rural areas. In addition, note that the within channel accounts for 44% of the decline in informality between 2002 and 2006 when we focus on employment in household businesses (i.e., self-employed or work for other household business) as a definition of informality.

Outside of agriculture and aquaculture the reduction in informal employment was driven more by within industry changes than between industry changes. In particular, excluding agriculture and aquaculture, the within industry channel accounts for 69 to 78% of the change in overall decline in informality, depending on the definition of informality. The within channel is important for declines in informality in urban (87%) and rural (75%) areas. Thus, the overall pattern of reductions in informal employment, especially in urban areas and outside of agriculture and aquaculture, is largely a within industry phenomenon, which is consistent with the expansion of larger, more formal firms in response to increased foreign market access, as discussed in section 2.

7. The BTA and between and within industry informality

In the previous section we demonstrated that the between and within industry changes in informality play an important role in explaining the aggregate decline in informal jobs. In this section we explore whether the between and within industry changes in informality intensity are related to the BTA tariff cuts.

As discussed in section 2, the effects of trade reform for informality depend in part on the mobility of labour across sectors subsequent to trade reform. The theory predicts that, all else equal, industries that observed greater increases in export market access (i.e., bigger reductions in U.S. tariffs) should observe an increase in employment relative to industries with smaller or no tariff changes. To the extent that expanding industries are more formality intensive, trade would increase the incidence of formal jobs through this channel. We examine the predictions on between-industry mobility empirically in the following manner. First, we correlate changes in industry employment between 2002 and 2006 with the industry's informality intensity. A strong negative correlation would suggest expansion of employment in "formal" industries. We then examine whether declines in U.S. tariffs on Vietnam's exports affected the allocation of employment across Vietnamese industries. In particular, we regress the change in industry share of total employment on the change in industry tariffs, year indicators, and industry indicators. Note that the inclusion of industry indicators allows for secular trends in industry employment shares. The outcomes of these regressions are best illustrated with Figure 1. This figure plots the change in share of industry employment against the informality-intensity of an industry.[6] Agriculture is the one outlier industry. These figures show no statistically significant correlation between informality-intensity and the change in the share of industry employment. The correlation between the two variables is -.26 for all industries and .09 when agriculture is excluded. So, while the share of employment in agriculture, the most informality-intensive industry, is declining, we find no strong statistically significant relationship between changes in industry employment shares and informality-intensity.

[6] In figure 1, the informality intensity is measured using the self-employment definition of informality. Appendix Figures A.1 and A.2 replicate the analysis for the other two measures of informality. All three definitions lead to similar findings.

Turning to formal regression analysis, we begin exploring the relationship between market access and industry employment using the following framework:

$$\Delta s_j = \alpha + \beta \Delta tariff_j + \varepsilon_j \quad (5)$$

where Δsj is the change in the share of total employment in industry j and $\Delta tariff_j$ is the change in the U.S. tariff faced by industry j. The main coefficient of interest is the coefficient on the change in tariffs. Conventional theory predicts that employment should expand in industries receiving the largest tariff cuts on exports, implying that the coefficient should be negative.

The timing of the tariff cuts and the choice of study period used for identifying the impacts of the tariff cuts are important. We use the 2002 VHLSS as the baseline from which to measure changes in employment shares. This raises two concerns. First, some of the households were surveyed close to the end of the 2002. Hence, their employment data are reported for a period that is almost entirely after the entry into force of the BTA. Second, to the extent that firms and individuals changed behavior in anticipation of the BTA, this implies that some of the impacts were being felt prior to the date of implementation. Both observations suggest that by focusing on the period of 2002 to 2006 we may be underestimating the impact that that BTA has had as of 2006 on employment shares. Our estimates should thus be interpreted as the lower bound. Further to the timing of the BTA and the data we have available, we use the pre-BTA industry tariffs for t=2002 (i.e., Column 2 tariff rates in 2001) and the post-BTA tariffs (i.e., U.S. MFN tariffs) for t=2004 and t=2006.

The results are shown in Tables 10 and 11 for 2002 to 2004 and 2002 to 2006 respectively. We report a variety of specifications based on different samples of industries. Columns (1) through (3) focus on different sets of traded industries while columns (4) through (6) also include non-traded industries. In these latter specifications non-traded industries are assigned a change in tariff of 0. Focusing first on traded industries in table 10, there is a negative relationship between the change in industry tariff and the share of employment nationally and in rural areas, as predicted by theory. However, the relationship is not statistically significant and the coefficient estimates suggests a small impact. For example, between 2002 and 2004, the average tariff cut of 23.4 percentage points is associated with an increase in the share of employment of 1.3 percent nationally. The table also reports the

results where equation (5) was estimated separately for rural and urban areas, albeit the coefficient estimates turn positive and statistically insignificant when agriculture, forestry, and aquaculture are excluded.[7] The inclusion of non-traded industries does not substantially change the findings, although the coefficient on change in tariffs becomes positive and statistically insignificant for all specifications in urban areas. Table 11 estimates equation (5) for 2002-2006 sample and yields similar findings.

Having established that the BTA did not appreciably influence worker allocation across industries, we next turn to examining the extent to which trade affects the probability of formal employment within an industry. We established previously that outside of agriculture and aquaculture most of the reduction in informal employment was due to within industry changes. We now investigate whether these changes are related to the BTA. In particular, we use a linear probability model and regress an indicator I_{ijt} for whether a worker *i* employed in industry *j* at time *t* works in the informal sector on a vector of worker characteristics H_{ijt}, such as age, age squared, education indicators, gender, geographic location, and a set of industry indicators J_j indicating worker i's industry affiliation:

$$I_{ijt} = H_{ijt}\beta_D + tariff_{jt} * \beta + J_j + t_t + \varepsilon_{ijt} \quad (5)$$

where $tariff_{jt}$ is the industry tariff in industry j at time t, J_j is a vector of industry fixed effects, and t is a vector of year indicators. We account for general forms of heteroskedasticity and serial correlation in the error term by computing robust (Huber-White) standard errors clustered by industry. The main parameter of interest is the coefficient on tariffs. A positive coefficient will imply that a decline in tariffs is associated with a decline in probability of informal employment.

Note that controlling for individual worker characteristics eliminates some of the potential estimation biases in the relationship between informality and tariffs stemming from differences in worker composition across industries. Inclusion of these controls additionally reduces the potential estimation biases. For example, business cycle fluctuations might independently impact tariff formation and the probability of formal employment. During the period of our study, Vietnam experienced rapid economic growth, which might have

[7] These results are robust to restricting the sample of workers to members of the 2002-2004 individual panel.

independently moved employment toward formal jobs and also increased the incentives for Vietnam and the US to reach a free trade agreement. Year fixed effects thus control for the endogeneity of the timing of the agreement. Note that our key identification variation in tariffs is based on differential changes in tariffs facing Vietnamese exports in the U.S. across industries. The advantage of tariff variation across industries used in our analysis is that they are likely exogenous to these developments (please see Section 3 for details). Thus, our estimates of the key coefficient on tariff are less prone to the usual concerns about the endogeneity of tariff protection.

Our main results are shown in Table 12, which focuses on traded industries. We find that nationally, and within urban and rural areas separately, the industries that faced the largest reductions in U.S. tariffs experienced the largest decreases in informal employment between 2002 and 2006. Depending on the definition of informality, the national coefficient estimates range from 0.210 to 0.266 and are statistically significant at the 1 percent level. In terms of magnitude, this suggests that an industry that experienced the average reduction in tariffs, 23.4 percentage points, saw informality fall by between 4.9 and 6.2 percentage points relative to an industry facing no reduction in tariffs. The magnitudes of the coefficient is larger in rural areas than urban areas.

We next explore the robustness of our baseline results to alternative definitions of the sample of workers. We begin by excluding workers within agriculture and aquaculture. The results are shown in Table 13. Interestingly, the exclusion of agriculture lowers the magnitude of the coefficient on industry tariffs. We continue to finds that declines in industry tariffs are associated with declines in informal employment, but the estimates for the country as a whole range from .145 to .149. This suggest that an industry that experienced 23.4 percentage point reduction in tariffs observed a 3.3 percentage point reduction in informality. The exclusion of agriculture also makes the coefficient estimates more close in magnitudes for urban and rural areas, especially for the first definition of informality (which encompasses all self-employed workers). This suggests that perhaps that large differences in the magnitude of the coefficients between urban and rural areas in table 12 were in part driven by the agricultural sector. The

results are consistent nationally and within rural areas, but are slightly weaker in urban areas using our two broadest definitions of informality.

In table 14 we include workers in all industries, including non-traded industries, to which we assign a tariff of 0. We continue to find positive and statistically significant coefficient on tariffs nationally, and within urban and rural areas. However, the magnitude of the coefficient is lower relative to the magnitudes we obtained for traded industries in table 12. In particular, the estimates in column 1 of table 14 suggest that a 23.4 percentage point decline in tariffs would be associated with a 3.7 percentage point decline in informality. This suggests that the inclusion of nontraded sectors dampens the magnitude of the effects we found when we focused on traded sector alone. Lastly, we include non-traded industries and exclude agriculture and aquaculture (table 15). The main results are robust to this change in sample as well. While the magnitude of the coefficient is somewhat lower than the magnitudes we obtained in table 15, the exclusion of agriculture and aquaculture does not change our results substantially.[8]

These results are consistent with a model in which larger, more formal firms expand in response to an increase in export market access with the expansion being greatest in industries that experienced the largest increases in export market access. The increase in U.S. market access is associated with an expansion of the formal sector and the impact, relative to the overall reduction in informality is reasonably large.

8. Conclusion

This paper examines how expanded export opportunities affect reallocation of employment from less to more formal firms within industries in Vietnam. We document large declines in informal employment in Vietnam during the period that follows the U.S.-Vietnam Bilateral Trade Agreement. We subsequently show that a large portion of this decline in informality is driven by reallocation of labor from less to more formal firms within industries. This within-industry component becomes particularly pronounced in a sample that excludes agriculture and aquaculture. Declines in tariffs are associated with an increased probability of formal employment within an industry, as the workers shift their employment away from being

[8] In unreported regressions, we have also repeated the analysis separately for 2002 and 2004 and 2002 and 2006. This analysis yielded similar conclusions.

self-employed or working for another household business toward more formal employment in private sector, state sector, or foreign owned sector. An important contribution of this research is the exploration of economy wide reallocation of workers from informal to formal businesses within industries in response to increased foreign market access. Although these responses have been documented previously, they are usually restricted to the urban manufacturing sector and thus exclude the majority of workers in many developing countries.

The results are related to the larger question of how to generate good jobs in developing economies. As in a related paper (McCaig and Pavcnik (2011)) that focuses on household businesses, our evidences suggests that increased foreign market access leads to the reallocation of employment within industries to more formal firms rather than the expansion of initially smaller firms. Our evidence from Vietnam is thus consistent with La Porta and Shleifer (2008) who show that the level of informality generally declines with economic development through the growth of formal firms and the decline of informal firms.

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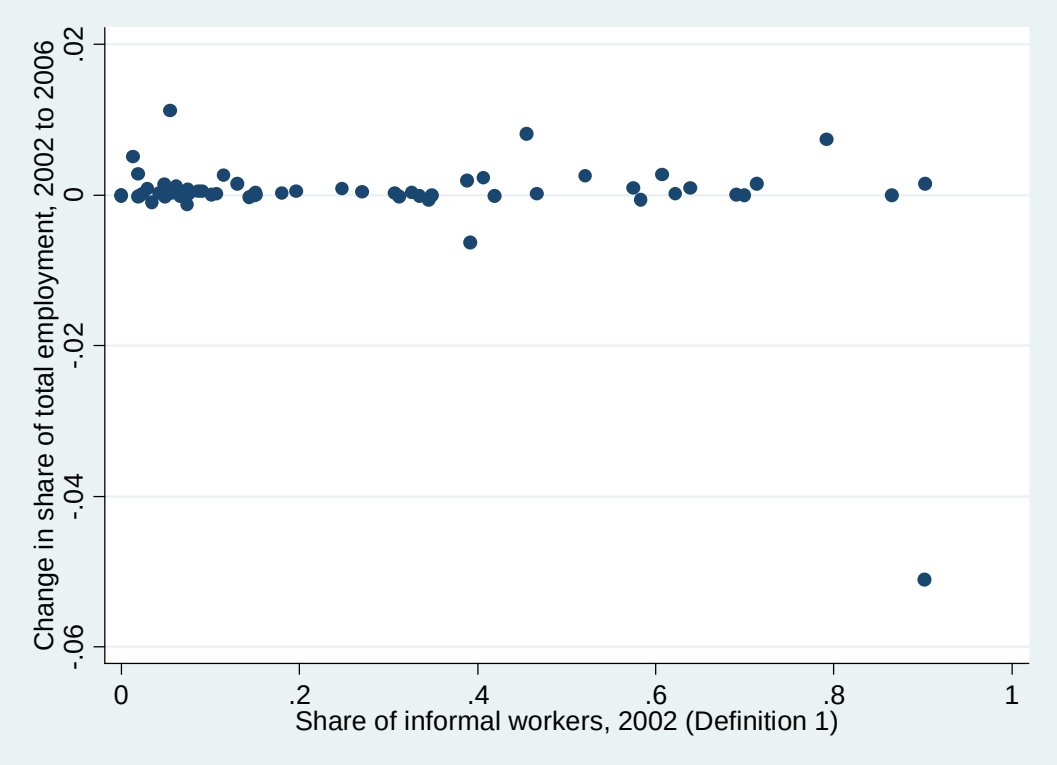
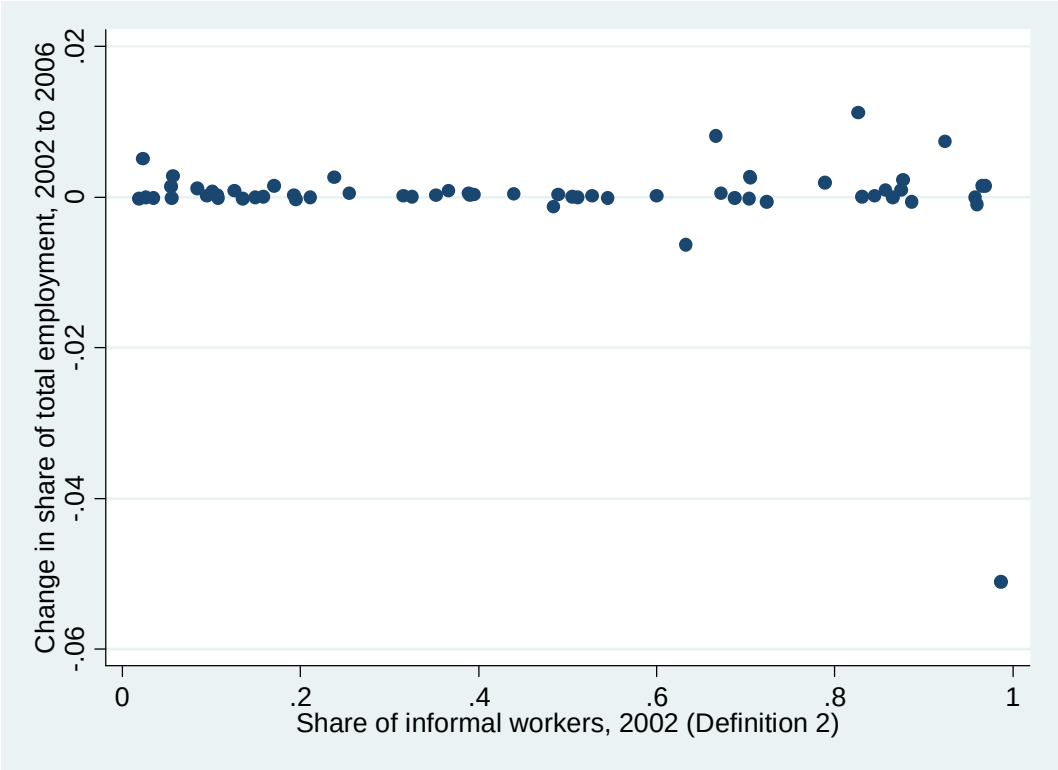
Figure 1: Change in the industry share of total employment (2002-2006) and the informality-intensity of industry in 2002



Notes:
1. Informality is defined as workers who are self-employed.
2. The major outlier in the lower right corner is agriculture.
3. The correlation is -0.2642 for all industries, but 0.0921 when agriculture is excluded.

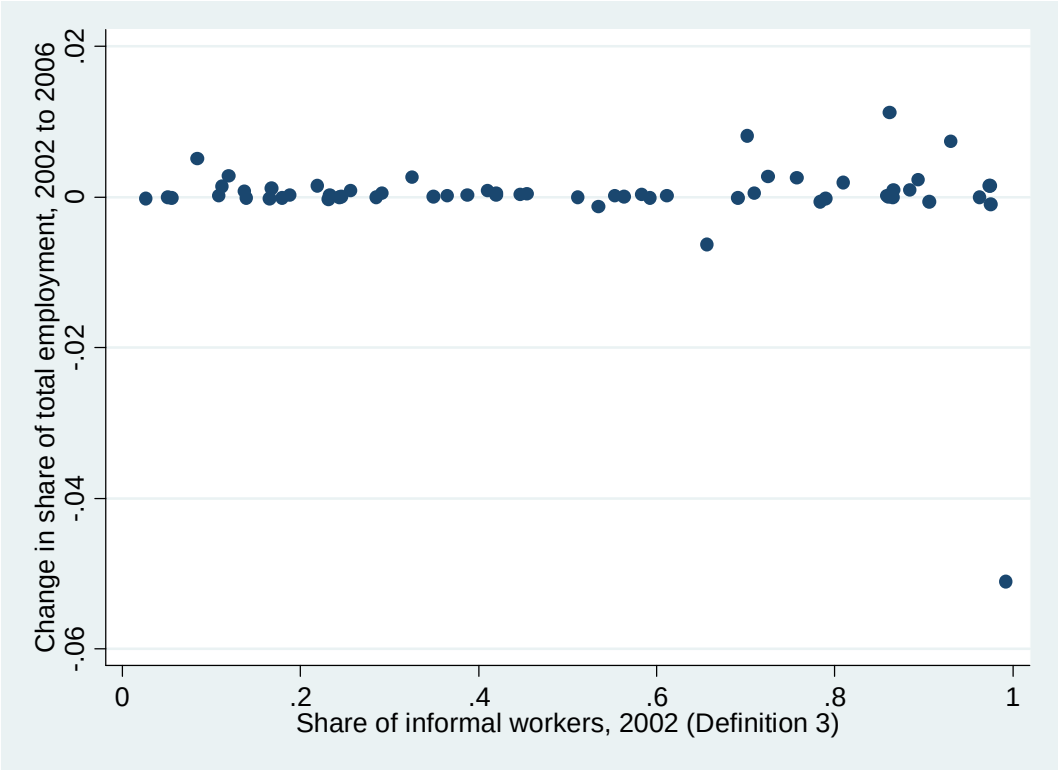
Appendix Figures

Figure A.1: Change in the industry share of total employment (2002-2006) and the informality-intensity of industry in 2002



Notes:
1. Informality is defined as workers who are self-employed + working for other households.
2. The major outlier in the lower right corner is agriculture.
3. The correlation is -0.1524 for all industries, but 0.1466 when agriculture is excluded.

Figure A.2: Change in the industry share of total employment (2002-2006) and the informality-intensity of industry in 2002



Notes:
1. Informality is defined as workers who are self-employed + working for other households + wage workers without benefits.
2. The major outlier in the lower right corner is agriculture.
3. The correlation is -0.1467 for all industries, but 0.1525 when agriculture is excluded.

Table 1 - Summary of U.S. tariffs applied to imports from Vietnam

Industry	Number of industries	Mean pre-BTA tariff (Column 2)	Mean post-BTA tariff (MFN)	Mean tariff cut	Standard deviation of tariff cut
Agriculture, hunting & forestry	3	0.085	0.016	0.069	0.010
Fishing	1	0.013	0.002	0.011	
Mining	9	0.027	0.001	0.026	0.045
Manufacturing	57	0.330	0.034	0.296	0.148
Other	6	0.080	0.002	0.077	0.111
Total	76	0.260	0.027	0.234	0.171

Source : Taken from McCaig (Forthcoming). Author's own calculations based on the U.S. International Trade Commission's 2001 tariff schedule.
Note: The tariffs reported are weighted average tariffs. For each commodity-line tariff, its weight is the share of imports within the sector based on 2001 U.S. imports.

Table 2 - Main commodity exports from Vietnam to the U.S.

SITC Code	SITC Description	2004 Value (million USD)	Annual Growth 2001 to 2004 (%)	Share of exports to U.S. in 2004 (%)
84	Articles of apparel and clothing accessories	2571	276.5	48.7
3	Fish	568	5.9	10.8
85	Footwear	475	53.2	9.0
82	Furniture	386	206.4	7.3
33	Petroleum	349	24.0	6.6
5	Vegetables and fruit	184	54.2	3.5
7	Coffee and tea	144	17.3	2.7

Source: U.S. International Trade Commission.
Taken from McCaig (forthcoming).

Table 3: Total number of households per survey

	2002	2004	2006
Total	74,350	45,928	45,943
Rural	57,122	34,977	34,423
Urban	17,228	10,951	11,520

Notes: The definition of rural and urban is based on the contemporary definition within each survey.

Table 4: Share of workers by occupation categories

	Repeated cross sections			2002-2004 panel		2002-2006 panel	
Occupation	**2002**	**2004**	**2006**	**2002**	**2004**	**2002**	**2006**
				Rural and Urban			
Armed forces	0.005	0.004	0.003	0.005	0.003	0.004	0.003
Leaders in all fields and levels	0.011	0.014	0.015	0.012	0.013	0.012	0.015
High-level professionals in all fields	0.022	0.024	0.027	0.023	0.023	0.019	0.023
Mid-level professionals in all fields	0.030	0.034	0.034	0.032	0.033	0.033	0.034
Staff (elementary professionals, white-collar technical personnel) in all fields	0.014	0.017	0.015	0.015	0.017	0.014	0.014
Skilled workers in personal services, social safety protection and sales	0.028	0.031	0.036	0.029	0.030	0.027	0.037
Skilled workers in agriculture, forestry, and fishery	0.031	0.019	0.023	0.030	0.019	0.029	0.022
Skilled handicraftsmen and other relating skilled manual workers	0.097	0.103	0.111	0.086	0.099	0.081	0.105
Assemblers and machine operators	0.023	0.025	0.026	0.022	0.023	0.021	0.025
Unskilled workers	0.739	0.730	0.710	0.748	0.739	0.759	0.723
Not reported	0.000	0.000	0.000	0.000	0.000	0.000	0.000
				Rural only			
Armed forces	0.002	0.002	0.001	0.003	0.001	0.002	0.001
Leaders in all fields and levels	0.008	0.011	0.012	0.009	0.010	0.010	0.013
High-level professionals in all fields	0.008	0.010	0.009	0.008	0.010	0.007	0.008
Mid-level professionals in all fields	0.019	0.023	0.023	0.020	0.021	0.020	0.021
Staff (elementary professionals, white-collar technical personnel) in all fields	0.005	0.007	0.008	0.006	0.007	0.007	0.007
Skilled workers in personal services, social safety protection and sales	0.017	0.018	0.025	0.018	0.017	0.018	0.025
Skilled workers in agriculture, forestry, and fishery	0.036	0.022	0.026	0.035	0.022	0.033	0.026
Skilled handicraftsmen and other relating skilled manual workers	0.075	0.086	0.097	0.065	0.083	0.062	0.093
Assemblers and machine operators	0.014	0.014	0.017	0.013	0.014	0.012	0.016
Unskilled workers	0.815	0.808	0.781	0.823	0.815	0.829	0.789
Not reported	0.000	0.000	0.000	0.000	0.000	0.000	0.000
				Urban only			
Armed forces	0.012	0.010	0.010	0.011	0.009	0.010	0.008
Leaders in all fields and levels	0.019	0.023	0.024	0.019	0.023	0.021	0.023
High-level professionals in all fields	0.067	0.073	0.088	0.068	0.070	0.059	0.075
Mid-level professionals in all fields	0.065	0.070	0.071	0.071	0.072	0.077	0.076
Staff (elementary professionals, white-collar technical personnel) in all fields	0.041	0.047	0.038	0.043	0.050	0.037	0.039
Skilled workers in personal services, social safety protection and sales	0.064	0.074	0.068	0.065	0.074	0.057	0.077
Skilled workers in agriculture, forestry, and fishery	0.015	0.010	0.011	0.014	0.008	0.016	0.009
Skilled handicraftsmen and other relating skilled manual workers	0.166	0.158	0.159	0.151	0.154	0.145	0.146
Assemblers and machine operators	0.054	0.059	0.056	0.049	0.056	0.048	0.054
Unskilled workers	0.497	0.476	0.474	0.509	0.484	0.532	0.493
Not reported	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes:
1. The shares are estimated using contemporary sample weights.
2. The sample is resticted to individuals age 15 to 64 in each year.
3. The results are generated in the do file "Employment by occupation.do".

Table 5: Share of workers by ownership sector

	Repeated cross sections			2002-2004 panel		2002-2006 panel	
Ownership Sector	**2002**	**2004**	**2006**	**2002**	**2004**	**2002**	**2006**
				Urban and Rural			
Self employed on household farm	0.507	0.488	0.499	0.522	0.498	0.542	0.503
Self employed in household business	0.187	0.186	0.181	0.190	0.185	0.188	0.181
Work for other households on a farm	0.051	0.043	0.041	0.044	0.045	0.040	0.039
Work for other households in a business	0.099	0.103	0.106	0.088	0.100	0.086	0.109
State sector	0.107	0.111	0.100	0.109	0.107	0.103	0.100
Collectives	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Private sector	0.023	0.047	0.048	0.022	0.045	0.021	0.047
Foreign sector	0.010	0.016	0.017	0.009	0.014	0.006	0.015
Unknown	0.009	0.000	0.000	0.009	0.000	0.007	0.000
				Rural only			
Self employed on household farm	0.622	0.599	0.604	0.641	0.605	0.655	0.602
Self employed in household business	0.139	0.143	0.137	0.143	0.144	0.144	0.145
Work for other households on a farm	0.061	0.052	0.048	0.052	0.052	0.047	0.046
Work for other households in a business	0.083	0.093	0.094	0.072	0.090	0.069	0.096
State sector	0.059	0.065	0.061	0.058	0.062	0.056	0.061
Collectives	0.006	0.005	0.005	0.006	0.006	0.006	0.006
Private sector	0.014	0.032	0.036	0.012	0.031	0.011	0.035
Foreign sector	0.006	0.011	0.014	0.005	0.009	0.003	0.010
Unknown	0.010	0.000	0.000	0.010	0.000	0.008	0.000
				Urban only			
Self employed on household farm	0.131	0.124	0.128	0.147	0.134	0.170	0.157
Self employed in household business	0.343	0.332	0.336	0.339	0.324	0.335	0.307
Work for other households on a farm	0.021	0.016	0.017	0.019	0.019	0.019	0.015
Work for other households in a business	0.153	0.136	0.151	0.139	0.134	0.142	0.158
State sector	0.266	0.262	0.237	0.271	0.259	0.258	0.234
Collectives	0.008	0.008	0.010	0.005	0.008	0.004	0.007
Private sector	0.053	0.092	0.091	0.054	0.091	0.053	0.086
Foreign sector	0.022	0.031	0.031	0.022	0.031	0.017	0.034
Unknown	0.003	0.000	0.000	0.003	0.000	0.002	0.000

Notes:
1. The shares are estimated using contemporary sample weights.
2. The sample is resticted to individuals age 15 to 64 in each year.
3. The results are generated in the do file "Employment by ownership.do".

Table 6: Share of employees reporting non-wage/salary payments

	Repeated Cross Sections			2002-2004 panel		2002-2006 panel	
Payment Type	**2002**	**2004**	**2006**	**2002**	**2004**	**2002**	**2006**
All individuals that report working for others							
Holidays	0.496	0.522	0.535	0.511	0.509	0.506	0.536
Social subsidy (including maternity benefits)	0.018	0.021	0.019	0.020	0.017	0.021	0.014
Business trips	0.068	0.070	0.060	0.076	0.066	0.081	0.065
Other	0.359	0.404	0.409	0.376	0.397	0.377	0.417
Any benefit	0.565	0.605	0.623	0.584	0.593	0.582	0.627
All individuals that report working for other households							
Holidays	0.182	0.189	0.212	0.178	0.178	0.174	0.224
Social subsidy (including maternity benefits)	0.002	0.002	0.003	0.003	0.003	0.003	0.003
Business trips	0.003	0.002	0.002	0.002	0.001	0.002	0.003
Other	0.151	0.198	0.223	0.151	0.193	0.159	0.244
Any benefit	0.265	0.307	0.340	0.265	0.298	0.268	0.364
All individuals that report working in the state sector							
Holidays	0.889	0.889	0.881	0.884	0.888	0.883	0.883
Social subsidy (including maternity benefits)	0.042	0.046	0.040	0.045	0.039	0.048	0.030
Business trips	0.179	0.192	0.173	0.183	0.184	0.197	0.188
Other	0.614	0.631	0.595	0.614	0.630	0.602	0.609
Any benefit	0.929	0.929	0.919	0.926	0.926	0.922	0.920
All individuals that report working in the collective sector							
Holidays	0.471	0.620	0.732	0.439	0.604	0.416	0.748
Social subsidy (including maternity benefits)	0.014	0.016	0.018	0.012	0.014	0.029	0.020
Business trips	0.047	0.030	0.043	0.050	0.029	0.047	0.058
Other	0.361	0.417	0.429	0.309	0.413	0.350	0.405
Any benefit	0.548	0.687	0.781	0.514	0.685	0.520	0.790
All individuals that report working in the private sector							
Holidays	0.688	0.626	0.683	0.685	0.624	0.680	0.700
Social subsidy (including maternity benefits)	0.013	0.014	0.017	0.015	0.016	0.003	0.014
Business trips	0.029	0.024	0.024	0.039	0.020	0.051	0.028
Other	0.512	0.449	0.480	0.569	0.451	0.594	0.474
Any benefit	0.798	0.702	0.759	0.817	0.698	0.826	0.761
All individuals that report working in the foreign sector							
Holidays	0.848	0.830	0.832	0.853	0.824	0.821	0.843
Social subsidy (including maternity benefits)	0.019	0.038	0.037	0.005	0.009	0.006	0.019
Business trips	0.036	0.026	0.015	0.050	0.037	0.000	0.014
Other	0.603	0.670	0.725	0.576	0.658	0.555	0.747
Any benefit	0.916	0.898	0.905	0.915	0.894	0.876	0.903

Notes:
1. The shares are estimated using sample weights.
2. The output is created by the do file "Summarize benefit payments.do".
3. Based on individuals between the ages of 15 and 65 inclusive. For the individuals panels the sample is individuals aged 15 to 65 in 2002.

Table 7: Employment Transition Matrix for 2002 and 2004 VHLSS Individual Panel

Major Industrial Sectors

		2004				
		Not working	**Primary**	**Secondary**	**Tertiary**	**Total**
2002	**Not working**	0.096	0.035	0.014	0.020	0.165
	Primary	0.030	0.424	0.037	0.032	0.523
	Secondary	0.006	0.018	0.079	0.015	0.117
	Tertiary	0.011	0.023	0.014	0.147	0.195
	Total	0.143	0.499	0.144	0.214	1.000

Sector of Ownership

		2004						
		Not working	**Self employed**	**Other households**	**State**	**Collective**	**Private**	**Foreign**	**Total**
2002	**Not working**	0.096	0.044	0.011	0.007	0.000	0.006	0.002	0.166
	Self employed	0.038	0.516	0.040	0.009	0.002	0.008	0.002	0.615
	Other households	0.006	0.031	0.061	0.003	0.001	0.008	0.001	0.110
	State	0.002	0.006	0.002	0.069	0.001	0.003	0.001	0.084
	Collective	0.000	0.002	0.001	0.001	0.001	0.000	0.000	0.005
	Private	0.001	0.002	0.003	0.001	0.000	0.006	0.001	0.014
	Foreign	0.000	0.000	0.001	0.001	0.000	0.001	0.003	0.006
	Total	0.144	0.601	0.119	0.089	0.005	0.032	0.010	1.000

Notes:
1. Created by the do file "Employment transitions.do".
2. Restricted to individuals age 15 to 64 in 2002.
3. In the bottom panel individuals that did not report the sector of ownership are excluded.

Table 8: Share of informal employment

Definition of informal employment	2002	2004	2006	2002	2004	2006	2002	2004	2006
	All industries			Excluding ag. and fisheries			Manufacturing		
Urban and rural									
Self-employed	0.702	0.673	0.661	0.445	0.406	0.390	0.386	0.346	0.307
Self-employed + working for other households	0.857	0.824	0.818	0.683	0.633	0.629	0.660	0.594	0.562
Self-employed + working for other households + wage worker without benefits	0.873	0.848	0.842	0.711	0.683	0.677	0.697	0.656	0.620
Urban									
Self-employed	0.481	0.459	0.453	0.412	0.389	0.386	0.302	0.267	0.265
Self-employed + working for other households	0.655	0.609	0.622	0.595	0.546	0.563	0.527	0.470	0.485
Self-employed + working for other households + wage worker without benefits	0.675	0.645	0.653	0.616	0.586	0.599	0.551	0.520	0.523
Rural									
Self-employed	0.767	0.735	0.721	0.471	0.419	0.393	0.439	0.388	0.328
Self-employed + working for other households	0.916	0.885	0.875	0.753	0.693	0.675	0.745	0.659	0.600
Self-employed + working for other households + wage worker without benefits	0.930	0.907	0.897	0.787	0.751	0.731	0.789	0.727	0.668

Notes:
1. Based on workers aged 15 to 64 inclusive.
2. All individuals with missing information on the ownership sector or industry have been dropped.
3. Sampling weights included.
Source: Author's own estimates based on the 2002, 2004, and 2006 VHLSS.

2002-2004 panel

	2002	2004	2006	2002	2004	2006	2002	2004	2006
	All industries			Excluding ag. and fisheries			Manufacturing		
Urban and rural									
Self-employed	0.721	0.690		0.460	0.425		0.416	0.383	
Self-employed + working for other households	0.858	0.834		0.677	0.645		0.669	0.624	
Self-employed + working for other households + wage worker without benefits	0.874	0.857		0.706	0.691		0.703	0.676	
Urban									
Self-employed	0.492	0.467		0.412	0.392		0.301	0.271	
Self-employed + working for other households	0.650	0.612		0.580	0.542		0.514	0.475	
Self-employed + working for other households + wage worker without benefits	0.669	0.641		0.602	0.575		0.535	0.516	
Rural									
Self-employed	0.788	0.750		0.499	0.447		0.494	0.441	
Self-employed + working for other households	0.918	0.895		0.755	0.714		0.774	0.703	
Self-employed + working for other households + wage worker without benefits	0.933	0.915		0.790	0.768		0.817	0.760	

Notes:
1. Based on workers aged 15 to 64 inclusive in 2002.
2. All individuals with missing information on the ownership sector or industry have been dropped.
3. Sampling weights included.
Source: Author's own estimates based on the 2002, 2004, and 2006 VHLSS.

2002-2006 panel

	2002	2004	2006	2002	2004	2006	2002	2004	2006
	All industries			Excluding ag. and fisheries			Manufacturing		
Urban and rural									
Self-employed	0.736		0.709	0.471		0.439	0.428		0.397
Self-employed + working for other households	0.866		0.846	0.688		0.665	0.677		0.649
Self-employed + working for other households + wage worker without benefits	0.881		0.864	0.717		0.704	0.713		0.691
Urban									
Self-employed	0.508		0.495	0.416		0.400	0.281		0.290
Self-employed + working for other households	0.668		0.648	0.592		0.569	0.512		0.517
Self-employed + working for other households + wage worker without benefits	0.689		0.668	0.616		0.594	0.537		0.544
Rural									
Self-employed	0.801		0.767	0.514		0.464	0.529		0.454
Self-employed + working for other households	0.922		0.900	0.763		0.728	0.791		0.719
Self-employed + working for other households + wage worker without benefits	0.936		0.917	0.798		0.775	0.836		0.770

Notes:
1. Based on workers aged 15 to 64 inclusive in 2002.
2. All individuals with missing information on the ownership sector or industry have been dropped.
3. Sampling weights included.
Source: Author's own estimates based on the 2002, 2004, and 2006 VHLSS.

Table 9: Decomposing changes in informal employment

		Repeated Cross Sections		Individual Panels		Repeated Cross Sections		Individual Panels	
		2002-2006	2002-2004	2002-2006	2002-2004	2002-2006	2002-2004	2002-2006	2002-2004
		All industries				Excluding ag. and fisheries			
Urban and rural									
	Within	-0.011	-0.006	-0.006	-0.010	-0.042	-0.028	-0.026	-0.022
Self-employed	Between	-0.030	-0.023	-0.022	-0.022	-0.012	-0.011	-0.006	-0.013
	Total	-0.042	-0.029	-0.028	-0.032	-0.055	-0.038	-0.032	-0.035
	Within	-0.017	-0.018	-0.008	-0.012	-0.042	-0.043	-0.023	-0.031
Self-employed + working for other households	Between	-0.022	-0.016	-0.012	-0.011	-0.012	-0.007	0.001	0.000
	Total	-0.039	-0.033	-0.020	-0.024	-0.053	-0.050	-0.022	-0.031
Self-employed + working for other	Within	-0.011	-0.010	-0.007	-0.007	-0.023	-0.022	-0.015	-0.015
households + wage worker without	Between	-0.019	-0.014	-0.010	-0.010	-0.011	-0.006	0.002	0.000
benefits	Total	-0.031	-0.024	-0.017	-0.017	-0.034	-0.028	-0.013	-0.015
Urban									
	Within	-0.020	-0.016	-0.006	-0.013	-0.028	-0.024	-0.014	-0.014
Self-employed	Between	-0.008	-0.006	-0.006	-0.012	0.002	0.001	-0.002	-0.006
	Total	-0.028	-0.022	-0.012	-0.025	-0.026	-0.023	-0.016	-0.020
	Within	-0.022	-0.037	-0.018	-0.028	-0.028	-0.045	-0.024	-0.034
Self-employed + working for other households	Between	-0.011	-0.009	-0.003	-0.010	-0.004	-0.004	0.001	-0.004
	Total	-0.033	-0.046	-0.020	-0.038	-0.032	-0.049	-0.023	-0.038
Self-employed + working for other	Within	-0.011	-0.021	-0.019	-0.018	-0.013	-0.026	-0.023	-0.022
households + wage worker without	Between	-0.011	-0.009	-0.002	-0.010	-0.004	-0.004	0.002	-0.004
benefits	Total	-0.021	-0.030	-0.020	-0.028	-0.017	-0.030	-0.021	-0.027
Rural									
	Within	-0.010	-0.004	-0.008	-0.011	-0.055	-0.033	-0.040	-0.032
Self-employed	Between	-0.036	-0.028	-0.027	-0.027	-0.023	-0.020	-0.010	-0.020
	Total	-0.046	-0.031	-0.034	-0.038	-0.078	-0.052	-0.050	-0.052
	Within	-0.018	-0.015	-0.008	-0.010	-0.058	-0.048	-0.030	-0.037
Self-employed + working for other households	Between	-0.022	-0.016	-0.015	-0.013	-0.020	-0.011	-0.005	-0.004
	Total	-0.041	-0.030	-0.023	-0.024	-0.078	-0.059	-0.036	-0.041
Self-employed + working for other	Within	-0.015	-0.010	-0.007	-0.007	-0.039	-0.027	-0.020	-0.019
households + wage worker without	Between	-0.019	-0.013	-0.012	-0.011	-0.017	-0.009	-0.003	-0.003
benefits	Total	-0.034	-0.023	-0.019	-0.018	-0.056	-0.036	-0.023	-0.022

Notes:
1. Based on workers aged 15 to 64 inclusive.
2. All individuals with missing information on the ownership sector or industry have been dropped.
3. Sampling weights included.
4. Created by do file "Informality changes decompositions.do".
Source: Author's own estimates based on the 2002, 2004, and 2006 VHLSS.

Table 10: Change in industry employment shares and change in industry tariff, 2002 to 2004

	(1)	(2)	(3)	(4)	(5)	(6)
			Urban & Rural			
Change in industry tariff	-0.00574	-0.000954	-0.000825	-0.000587	0.000334	0.000398
	(0.00669)	(0.00178)	(0.00189)	(0.00412)	(0.00144)	(0.00146)
Observations	34	33	31	60	59	57
R-squared	0.023	0.009	0.007	0.000	0.001	0.001
			Rural			
Change in industry tariff	-0.00758	-0.00149	-0.00156	-0.00124	-6.97e-05	-5.96e-05
	(0.00834)	(0.00153)	(0.00161)	(0.00514)	(0.00156)	(0.00158)
Observations	34	33	31	60	59	57
R-squared	0.025	0.030	0.031	0.001	0.000	0.000
			Urban			
Change in industry tariff	-0.00100	0.000793	0.00156	0.00160	0.00195	0.00220
	(0.00387)	(0.00310)	(0.00326)	(0.00286)	(0.00248)	(0.00251)
Observations	34	33	31	60	59	57
R-squared	0.002	0.002	0.008	0.005	0.011	0.014

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Sample: All workers age 15 to 64
Column 1: all traded industries
Column 2: all traded industries except agriculture
Column 3: all traded industries except agriculture, forestry, and aquaculture
Column 4: all industries
Column 5: all industries except agriculture
Column 6: all industries except agriculture, forestry, and aquaculture

Notes:
For regressions including non-traded industries the change in industry tariff has been set to 0 for non-traded industries.

Table 11: Change in industry employment shares and change in industry tariff, 2002 to 2006

	(1)	(2)	(3)	(4)	(5)	(6)
			Urban & Rural			
Change in industry	-0.00751	-0.00132	-0.00156	-0.000398	0.000720	0.000707
tariff	(0.00881)	(0.00196)	(0.00207)	(0.00546)	(0.00181)	(0.00185)
Observations	34	33	31	60	59	57
R-squared	0.022	0.014	0.019	0.000	0.003	0.003
			Rural			
Change in industry	-0.0100	-0.00247	-0.00289	-0.00172	-0.000352	-0.000410
tariff	(0.0107)	(0.00195)	(0.00205)	(0.00660)	(0.00203)	(0.00207)
Observations	-0.00320	0.000248	8.98e-05	-0.000205	0.00102**	0.000998**
R-squared	(0.00295)	(0.000546)	(0.000591)	(0.00137)	(0.000424)	(0.000439)
			Urban			
Change in industry	-0.000108	0.00259	0.00288	0.00412	0.00461*	0.00474*
tariff	(0.00459)	(0.00272)	(0.00290)	(0.00341)	(0.00256)	(0.00261)
Observations	34	33	31	60	59	57
R-squared	0.000	0.028	0.033	0.025	0.054	0.057

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Sample: All workers age 15 to 64
Column 1: all traded industries
Column 2: all traded industries except agriculture
Column 3: all traded industries except agriculture, forestry, and aquaculture
Column 4: all industries
Column 5: all industries except agriculture
Column 6: all industries except agriculture, forestry, and aquaculture

Notes:
For regressions including non-traded industries the change in industry tariff has been set to 0 for non-traded industries.

Table 12 : Working in an informal job and increased export opportunities

	Urban and Rural			Urban			Rural		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Informal 1	Informal 2	Informal 3	Informal 1	Informal 2	Informal 3	Informal 1	Informal 2	Informal 3
Industry tariff	0.257	0.266	0.210	0.191	0.141	0.112	0.285	0.324	0.262
	(0.039)***	(0.017)***	(0.016)***	(0.046)***	(0.042)***	(0.029)***	(0.043)***	(0.033)***	(0.036)***
Age	0.002	-0.000	-0.002	0.001	-0.003	-0.006	0.003	0.000	-0.001
	(0.003)	(0.002)	(0.001)*	(0.004)	(0.003)	(0.002)**	(0.003)	(0.002)	(0.001)
Age squared	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)***	(0.000)*	(0.000)**	(0.000)***	(0.000)	(0.000)	(0.000)
Indicator for primary education	0.070	0.004	0.004	0.046	0.003	0.000	0.070	0.002	0.002
	(0.008)***	(0.005)	(0.005)	(0.026)*	(0.007)	(0.009)	(0.006)***	(0.004)	(0.003)
Indicator for lower secondary education	0.116	-0.005	-0.006	0.100	-0.027	-0.030	0.113	-0.006	-0.007
	(0.009)***	(0.004)	(0.005)	(0.014)***	(0.027)	(0.030)	(0.007)***	(0.003)*	(0.003)**
Indicator for upper secondary education	0.106	-0.070	-0.072	0.055	-0.148	-0.154	0.115	-0.051	-0.052
	(0.010)***	(0.034)**	(0.036)*	(0.021)**	(0.053)***	(0.055)***	(0.006)***	(0.025)**	(0.026)*
Indicator for female	0.037	-0.001	-0.002	0.031	-0.005	-0.002	0.038	0.000	-0.001
	(0.011)***	(0.006)	(0.005)	(0.007)***	(0.014)	(0.013)	(0.013)***	(0.005)	(0.004)
Indicator for ethnic minority	0.023	0.004	0.002	-0.013	-0.049	-0.026	0.023	0.008	0.006
	(0.005)***	(0.003)	(0.002)	(0.021)	(0.013)***	(0.015)*	(0.006)***	(0.002)***	(0.001)***
Rural indicator	0.047	0.038	0.043						
	(0.019)**	(0.017)**	(0.019)**						
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	279344	279344	279344	36232	36232	36232	243112	243112	243112
R-squared	0.39	0.42	0.40	0.40	0.44	0.43	0.35	0.36	0.32

Robust standard errors clustered on industry in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Informal 1 includes self-employed; informal 2 includes self-employed or working for other hh businesses; informal 3 includes informal 2 + wage workers without any benefits.

Traded sample.

Table 13 : Working in an informal job and increased export opportunities

	Urban and Rural			Urban			Rural		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Informal 1	Informal 2	Informal 3	Informal 1	Informal 2	Informal 3	Informal 1	Informal 2	Informal 3
Industry tariff	0.149	0.150	0.145	0.122	0.061	0.065	0.145	0.177	0.166
	(0.042)***	(0.032)***	(0.032)***	(0.041)***	(0.039)	(0.039)	(0.046)***	(0.056)***	(0.053)***
Age	0.016	0.007	-0.001	0.008	-0.003	-0.009	0.019	0.010	0.002
	(0.006)**	(0.004)	(0.004)	(0.004)*	(0.004)	(0.004)**	(0.007)**	(0.004)**	(0.004)
Age squared	-0.000	-0.000	0.000	0.000	0.000	0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)*	(0.000)***	(0.000)	(0.000)	(0.000)
Indicator for primary education	0.084	0.001	-0.018	0.088	-0.059	-0.072	0.089	0.022	-0.002
	(0.038)**	(0.015)	(0.014)	(0.045)*	(0.022)**	(0.022)***	(0.044)*	(0.018)	(0.015)
Indicator for lower secondary education	0.102	-0.062	-0.083	0.077	-0.160	-0.168	0.122	-0.021	-0.052
	(0.046)**	(0.022)***	(0.022)***	(0.052)	(0.037)***	(0.038)***	(0.053)**	(0.025)	(0.023)**
Indicator for upper secondary education	0.060	-0.212	-0.235	0.028	-0.297	-0.306	0.096	-0.163	-0.197
	(0.044)	(0.037)***	(0.039)***	(0.052)	(0.053)***	(0.056)***	(0.048)*	(0.032)***	(0.035)***
Indicator for female	0.052	-0.017	-0.016	0.025	-0.013	-0.007	0.072	-0.014	-0.016
	(0.020)**	(0.019)	(0.018)	(0.011)**	(0.023)	(0.022)	(0.026)***	(0.017)	(0.016)
Indicator for ethnic minority	-0.011	0.007	0.048	-0.071	-0.053	-0.026	0.005	0.011	0.053
	(0.020)	(0.025)	(0.018)**	(0.032)**	(0.026)*	(0.030)	(0.021)	(0.031)	(0.014)***
Rural indicator	0.055	0.051	0.066						
	(0.021)**	(0.019)**	(0.019)***						
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	53967	53967	53967	20446	20446	20446	33521	33521	33521
R-squared	0.23	0.30	0.29	0.21	0.31	0.31	0.25	0.30	0.27

Robust standard errors clustered on industry in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Informal 1 includes self-employed; informal 2 includes self-employed or working for other hh businesses; informal 3 includes informal 2 + wage workers without any benefits.

Traded sample, excludes agriculture/acquaculture

Table 14 : Working in an informal job and increased export opportunities

	Urban and Rural			Urban			Rural		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Informal 1	Informal 2	Informal 3	Informal 1	Informal 2	Informal 3	Informal 1	Informal 2	Informal 3
Industry tariff	0.158	0.184	0.167	0.117	0.097	0.088	0.178	0.232	0.213
	(0.047)***	(0.034)***	(0.026)***	(0.037)***	(0.021)***	(0.017)***	(0.055)***	(0.053)***	(0.042)***
Age	0.004	-0.001	-0.003	0.007	-0.003	-0.007	0.004	0.000	-0.001
	(0.004)	(0.001)	(0.001)**	(0.005)	(0.003)	(0.003)**	(0.004)	(0.002)	(0.001)
Age squared	-0.000	0.000	0.000	-0.000	0.000	0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)***	(0.000)	(0.000)**	(0.000)***	(0.000)	(0.000)	(0.000)**
Indicator for primary education	0.069	0.003	0.006	0.042	0.001	-0.003	0.070	0.002	0.004
	(0.004)***	(0.003)	(0.004)	(0.014)***	(0.007)	(0.008)	(0.003)***	(0.003)	(0.004)
Indicator for lower secondary education	0.108	-0.007	-0.004	0.063	-0.033	-0.036	0.109	-0.006	-0.004
	(0.009)***	(0.007)	(0.005)	(0.022)***	(0.021)	(0.021)*	(0.005)***	(0.004)*	(0.003)
Indicator for upper secondary education	0.076	-0.097	-0.098	-0.007	-0.176	-0.182	0.101	-0.063	-0.064
	(0.024)***	(0.037)**	(0.036)***	(0.029)	(0.042)***	(0.042)***	(0.014)***	(0.027)**	(0.027)**
Indicator for female	0.044	-0.000	-0.003	0.045	-0.003	-0.004	0.043	0.001	-0.001
	(0.012)***	(0.006)	(0.006)	(0.014)***	(0.013)	(0.012)	(0.013)***	(0.004)	(0.004)
Indicator for ethnic minority	0.028	0.002	0.001	-0.020	-0.034	-0.011	0.024	0.006	0.007
	(0.004)***	(0.004)	(0.002)	(0.017)	(0.006)***	(0.008)	(0.005)***	(0.003)**	(0.002)***
Rural indicator	0.043	0.039	0.046						
	(0.011)***	(0.010)***	(0.011)***						
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	388099	388099	388099	84990	84990	84990	303109	303109	303109
R-squared	0.53	0.58	0.55	0.50	0.55	0.53	0.51	0.56	0.52

Robust standard errors clustered on industry in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Informal 1 includes self-employed; informal 2 includes self-employed or working for other hh businesses; informal 3 includes informal 2 + wage workers without any benefits.

Traded and nontraded sample.

Table 15: Working in an informal job and increased export opportunities

	Urban and Rural			Urban			Rural		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Informal 1	Informal 2	Informal 3	Informal 1	Informal 2	Informal 3	Informal 1	Informal 2	Informal 3
Industry tariff	0.136	0.174	0.161	0.108	0.095	0.086	0.147	0.212	0.200
	(0.031)***	(0.017)***	(0.017)***	(0.032)***	(0.022)***	(0.017)***	(0.034)***	(0.034)***	(0.033)***
Age	0.018	0.003	-0.003	0.014	-0.002	-0.008	0.021	0.006	0.000
	(0.005)***	(0.003)	(0.003)	(0.004)***	(0.003)	(0.004)**	(0.006)***	(0.003)**	(0.002)
Age squared	-0.000	-0.000	0.000	-0.000	0.000	0.000	-0.000	-0.000	0.000
	(0.000)**	(0.000)	(0.000)	(0.000)*	(0.000)	(0.000)**	(0.000)***	(0.000)	(0.000)
Indicator for primary education	0.038	-0.002	-0.006	0.043	-0.012	-0.019	0.040	0.006	0.001
	(0.015)**	(0.008)	(0.008)	(0.019)**	(0.016)	(0.015)	(0.016)**	(0.008)	(0.008)
Indicator for lower secondary education	0.039	-0.038	-0.043	0.027	-0.068	-0.071	0.051	-0.019	-0.028
	(0.019)**	(0.021)*	(0.021)**	(0.020)	(0.033)**	(0.032)**	(0.021)**	(0.016)	(0.016)*
Indicator for upper secondary education	-0.017	-0.176	-0.186	-0.046	-0.221	-0.226	0.020	-0.128	-0.145
	(0.020)	(0.038)***	(0.040)***	(0.023)**	(0.052)***	(0.052)***	(0.021)	(0.029)***	(0.032)***
Indicator for female	0.054	-0.006	-0.011	0.046	-0.005	-0.006	0.061	-0.005	-0.010
	(0.015)***	(0.014)	(0.012)	(0.017)***	(0.016)	(0.015)	(0.015)***	(0.012)	(0.010)
Indicator for ethnic minority	-0.023	-0.027	0.025	-0.048	-0.030	0.002	-0.010	-0.019	0.032
	(0.008)***	(0.009)***	(0.008)***	(0.012)***	(0.010)***	(0.012)	(0.008)	(0.010)*	(0.008)***
Rural indicator	0.040	0.039	0.050						
	(0.011)***	(0.011)***	(0.012)***						
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	162722	162722	162722	69204	69204	69204	93518	93518	93518
R-squared	0.50	0.52	0.49	0.49	0.52	0.50	0.52	0.53	0.48

Robust standard errors clustered on industry in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Informal 1 includes self-employed; informal 2 includes self-employed or working for other hh businesses; informal 3 includes informal 2 + wage workers without any benefits.

Traded and nontraded, excludes agriculture and acquaculture.