Growth and Informality: Evidence from Bangladesh

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Abstract

The informal sector accounts for the majority of employment in many developing countries, yet its role in growth, and its links with the formal sector, remain poorly understood. One view of the informal sector – the substitutability view - characterizes it as stagnant and unproductive and predicts that the sector will disappear as an economy develops. An alternative view – the complementarity view - characterizes the sector as allowing entrepreneurship and providing supply links to the formal sector, and predicts that the informal sector will exist (maybe even thrive) as economies develop. We use the experience of Bangladesh to examine the role that the informal sector plays in growth. Demand for Bangladesh's exports – particularly from the ready-made garments sector – has risen rapidly over the past two decades. We exploit exogenous variation in demand for exports, coupled with supply chain links that propagate these export-driven demand shocks throughout the economy, to examine the effect of sectoral growth on formal, informal, unpaid, and self-employment. Our results suggest that export-led growth increases employment levels in all four employment categories. However, in terms of employment *shares*, we find that sectoral growth causes a reallocation away from formal and informal employment towards self-employment. These results stand in contrast to the conventional view that as economies grow, employment shifts towards the formal sector, and suggest that the informal sector – and in particular self-employment - might play an important role in growth.

1. Introduction

The informal sector accounts for a substantial fraction of overall employment in many developing countries (LaPorta and Shleifer, 2014). This sector is generally characterized as being populated by small and unproductive firms. LaPorta and Shleifer (2008) note that an average formal firm has 126 employees whereas an average informal firm has four. In addition to being smaller than formal firms, these informal firms are also significantly less productive: across the wide range of countries considered in LaPorta and Shleifer (2008), the ratio of value added by an informal firm to that of a formal firm ranged from 1 to 70 percent. Given these facts, we are confronted with the possibility that the majority of the world's labor force might reside in small and (relatively) unproductive firms.

A number of studies have noted that participation in international trade might spur the reallocation of labor away from informal employment towards the formal sector. The theoretical argument, as presented in Melitz (2003), suggests that an increase in trade exposure will cause the the least productive firms to exit and will lead to reallocation of market share towards the most productive firms. Given the above evidence, we might therefore expect trade to also increase the share of labor employed by relatively productive, formal firms. Consistent with this theory, recent evidence from Vietnam presented by McCaig and Pavcnik (2014) suggests that reductions in export tariffs caused a reallocation of workers away from household business enterprises towards the formal sector. In contrast, Bosch et al. (2007) find little evidence of a link between trade liberalization in Brazil and informality. Similarly, Goldberg and Pavcnik (2003) find no impact of import tariff reductions in Brazil on informal employment and weak effects in Colombia.

This mixed evidence suggests that the link between trade and informality is nuanced and might vary based on the regional context. In this study, we examine the link between exports and informality in Bangladesh. Bangladesh presents an important context for examining this link: the economy has been transformed by growth in the export oriented ready-made garments industry (Heath and Mobarak, 2015). At the same time, there has been little change in the formal share of employment. Figure 1 plots the share of employment of the formal sector for years 2002, 2005 and 2010 against Bangladeshi exports to the OECD. Between 2002 and 2010, exports more than doubled. Across the same time period, the formal share of employment remained almost constant at around 14 percent.

We use detailed labor force data from the Bangladesh Labor Force Surveys (LFS) for years 2002, 2005 and 2010 and trade data on Bangladesh's exports to the Organisation for Economic Co-operation and Development (OECD) countries from UN Comtrade, to examine the link between export-driven growth and informality.[1] The LFS provides a

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[1]We focus on exports to the OECD since the OECD represents the main destination for Bangaldeshi

significant benefit for our analysis: as a nationally representative labor force survey, it covers all sectors and employment types in the economy. This allows us to create a granular measure of informality. In particular, we examine the impact of exports on four employment categories: formal, informal, unpaid and self employment. A central empirical challenge in studying the impact of trade on labor markets is the construction of a plausibly exogenous measure of exposure to trade. A number of studies have used industry-level tariff changes as an exogenous source of variation.[2] While tariff changes can be a useful tool for causal identification, these studies identify the impact of trade policy on labor markets. Our focus in this paper is on the outcomes of trade; that is, observed exports from Bangladesh to other countries.

A natural concern with using actual export values is that they will be endogenous in a regression of labor market outcomes on exports. To address this endogeneity, we construct a plausible instrumental variable for Bangladeshi exports using international trade patterns. In particular, a suitable instrument for Bangladeshi exports should reflect demand side factors in destination markets but should be independent of Bangladeshi supply-side effects. Following this logic, we use *intra*-OECD exports as an instrument for Bangladesh's exports to the OECD. Variation across sectors in intra-OECD exports should be reflective of demand patterns in OECD markets and should predict cross-sector variation in exports from Bangladesh to the OECD. At the same time, this instrument is unaffected by supply-side shocks in Bangladesh. It might be argued that intra-OECD exports are a weak instrument for Bangladeshi exports to the OECD. For instance, the structure of trade (and consequently, demand preferences) between OECD countries might be different than OECD trade with a developing country like Bangladesh. To address this concern, we carry out a robustness check by replicating our analysis with exports from low and middle income East Asian and Pacific (EAP) countries to the OECD as as an alternative instrument for Bangladeshi exports to the OECD.

An additional consideration in examining the impact of exports on labor market outcomes is the notion that export expansion in a particular industry could have general equilibrium effects through inter-industry linkages. To take a simple example, an expansion of exports in the ready-made garments industry in Bangladesh not only increases demand for garments but also for industries which provide inputs to garments such as cotton and transportation. More generally, these inter-industry linkages can play a significant role in propagating shocks in a particular sector throughout an economy (Acemoglu et al., 2012). Consequently, it is important to take these linkages into account when examining the impact of exports on labor markets, as they can be quite large in magnitude

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exports. UN Comtrade data indicates that for each of the years 2002, 2005 and 2010, the OECD constituted close to 90 percent of Bangladesh's world exports.

[2]Some examples include Topalova (2007), Topalova (2010) and McCaig and Pavcnik (2014). For a recent review of this literature, see Goldberg and Pavcnik (2016).

(Acemoglu et al., 2014). Furthermore, a benefit of considering inter-industry linkages is that it allows us to take into account non-traded sectors, which themselves do not export but have supply links to exporting sectors. This allows for a more comprehensive examination of the labor market effects of exports than focusing solely on traded sectors. In our analysis, we account for these spillover effects using the the Input-Output (IO) matrix for Bangladesh.

As a first step, we examine the effects of export demand on levels of formal, informal, unpaid and self employment at the sectoral level. We find that export demand increase employment levels across the board: a 1 percent increase in export demand increases formal employment by 0.3 percent, informal employment by 0.2 percent, unpaid employment by 0.5 percent and self employment by 0.6 percent. We then examine the effects of export demand on the allocation of labor across these employment types. We find little relationship between export growth and the share of formal and informal employment. However, export growth is associated with increased shares of unpaid and self-employment. The concurrent increase in self-employment and unpaid employment is consistent with the fact that unpaid employment in Bangladesh reflects unpaid family workers in household businesses.

Next, we turn to an individual-level analysis, and examine the impact of exports on the likelihood that an individual works in a particular type of employment. Our results are consistent with the aggregate level findings, and show that increased export demand leads to a reduction in the likelihood of formal and informal employment and increases in unpaid and self employment. Specifically, a 1 percent increase in export demand leads to a 0.05 percentage point decrease in formal employment and 0.02 percentage point decrease in informal employment, as well as a 0.01 percentage point increase in unpaid employment (not significant) and 0.05 percentage point increase in self-employment. These effects vary by gender and education level; the rise in the probability of being self-employed is driven largely by those with primary or lower education. The increase in the probability of self-employment is also greater for women than for men.

Our results indicate that export driven economic growth serves to increase self employment (at least in the short run). It is also notable that such growth has the largest effects for females and for those with lower levels of education. These results speak to a long standing debate on what the informal sector actually represents. The traditional view (e.g. Harris and Todaro, 1970; Fields, 1975; Chandra and Khan, 1993) regards the informal sector as a holding ground for workers shut off from formal sector jobs. An implication of this view is that as an economy develops and the pool of formal sector jobs expand, we should see a transition away from informality towards formality. Indeed, the results of McCaig and Pavcnik (2014) suggest that this might hold in the case of Vietnam. An alternative view (e.g. Fajnzylber et al., 2006; Bennett and Estrin, 2007) characterize

the informal sector as allowing entrepreneurship, providing flexible work hours/locations and providing supply links to the formal sector. This view predicts that the informal sector will continue to exist (and maybe even thrive) as the economy develops; our results are consistent with this view.

Recent empirical evidence indicates that self employment need not be regarded as employment of last resort. For instance, Falco and Haywood (2016) examine the rise in self-employment in Ghana over the years 2004 to 2011. They find that the returns on skills (both observable and unobservable) in self-employment have increased relative to wage employment. In addition, they find that over time, physical and human capital has increased among self-employed workers. Our results are also consistent with the interpretation that export growth might soften capital constraints and allow more individuals to engage in self employment activities. Capital constraints have been found to be one of the primary barriers to entrepreneurship (Blanchflower and Oswald, 1998).

Overall, our results point to a more nuanced view of the informal sector, and support the idea that at least some part of the informal sector may grow as the economy expands. This finding is consistent with previous work by Günther and Launov (2012), who find considerable heterogeneity within what is generally considered the informal sector: using data from Cote d'Ivoire, they note that around half the country's informal sector is comprised of those who are voluntarily self-employed. It could be the case that the opportunities generated as a result of increased export demand allows more individuals to participate in this sector.

The rest of the paper is organized as follows: Section 2 describes our empirical strategy, Section 3 describes our data, Section 4 presents results and Section 5 concludes.

2. Empirical strategy

2.1 Inter-sector linkages

We begin by formalizing the simple intuition that an increase in export demand in one sector has spillover effects on other sectors of the economy. Consider the following example: an increase in demand for ready made garments exports from Bangladesh naturally increases demand for garment output. It also increases output demand for sectors upstream from the garments industry. So, increased export demand might result in increased demand for cotton, cloth dying and transportation. These upstream effects, in turn, produce their own spillover effects. Thus, increased demand for cotton (or cloth dying or transportation) creates its own series of demand for other industries' output. This cycle of effects can be conveniently summarized through the Leontief inverse.

To construct the Leontief inverse, we begin with the input-output (IO) matrix for the economy. Consider a simple example of an IO matrix for a three sector economy:

	Activity A	Activity B	Activity C
Commodity A	a_{11}	a_{12}	a_{13}
Commodity B	a_{21}	a_{22}	a_{23}
Commodity C	a_{31}	a_{32}	a_{33}
Value Added	v_1	v_2	v_3

This matrix tells us that one unit of industry B's output requires a_{12} units of industry A's output, a_{22} units of its own output and a_{32} units of industry C's output. On top of these intermediate inputs, industry B adds v_2 units of value added. By construction, $a_{12} + a_{22} + a_{32} + v_2 = 1$.

Using such a matrix, we can write down the relationship between output, intermediate demand and final demand. Let Y represent output, B an IO matrix of the form discussed above[3] and D, final demand. Y can be written as the sum of intermediate demand BY and final demand D. The intermediate demand term represents the demand for a sector's output emanating from the other sectors of the economy. Consequently, output can be characterized as:

$$Y = (I - B)^{-1}D \tag{1}$$

where I is the identity matrix and the term $(I - B)^{-1}$ is the Leontief inverse.

For our analysis, we separate final demand into two components: domestic demand (Dom) and export demand (Exp). This implies:

$$Y = (I - B)^{-1}Dom + (I - B)^{-1}Exp \tag{2}$$

The term $(I - B)^{-1}Exp$ provides a characterization of total export demand. We can represent exports as an $N \times 1$ matrix where each element e_i represents Bangladesh's exports from sector i. The Leontief inverse is an $N \times N$ matrix where each element α_{ij} represents the proportion of industry $j's$ output that is provided by industry i. Thus, the product $(I - B)^{-1}Exp$ is an $N \times 1$ matrix of the following form:

$$(I - B)^{-1}Exp = \begin{bmatrix} \alpha_{11}e_1 + \alpha_{12}e_2 + ... + \alpha_{1N}e_N \\ \alpha_{21}e_1 + \alpha_{22}e_2 + ... + \alpha_{2N}e_N \\ \vdots \\ \alpha_{N1}e_1 + \alpha_{N2}e_2 + ... + \alpha_{NN}e_n \end{bmatrix} \tag{3}$$

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[3]With the the value added row removed since we use the IO matrix to construct intermediate demand.

Each row of this matrix represents a sector and the summation provides the total export demand for that sector. It is constituted of a direct component ($\alpha_{ii}e_i$) representing demand for sector $i's$ output as a consequence of sector i's exports and an indirect component (($\sum_j \alpha_{ij}e_j) - \alpha_{ii}e_i$, for each i) representing demand for sector i's output emanating from exports from other sectors. We study the effect of $(I - B)^{-1}Exp$ on employment levels and shares.

2.2 Empirical Specification

Our central interest is in examining the impact of export driven growth on employment outcomes. This can be motivated by considering a regression of employment on total output. Indexing sectors with j and years with t, we would like to estimate the following specification:

$$Emp_{jt} = \alpha + \beta_1 Y_{jt} + \varepsilon_{jt} \tag{4}$$

As noted in equation (2), the output Y consists of two components, $(I-B)^{-1}Dom$ and $(I-B)^{-1}Exp$. Our focus is on the latter term, $(I-B)^{-1}Exp$, which represents the total demand effect of Bangladesh's exports. This leads to our actual empirical specification:

$$Emp_{jt}^{Type} = \alpha + \beta_1 TotDem_{jt}^{BGDexpOECD} + \tau_t + \delta_k + \varepsilon_{jt} \tag{5}$$

where $Type$ refers to either formal, informal, unpaid or self-employment. The key variable of interest is $TotDem$ which is calculated by multiplying sector level Bangladeshi exports to the OECD with the Leontief inverse. τ_t represents year fixed effects and δ_k represents fixed effects for economic sectors defined broadly. [4]We use specification (5) to study the effect of total export demand on employment levels (natural log of formal, informal, unpaid and self-employment) as well as shares (employment for a given type divided by total employment in sector j in year t). We cluster standard errors at the sector level j.

In addition to the sector level analysis, we also examine how the impact of $TotDem$ varies by demographic characteristics like gender and educational levels. To do this, we move to an individual level specification of the following form:

$$Emp_{ijt}^{Type} = \alpha + \beta_1 TotDem_{jt}^{BGDexpOECD} + X_i + \tau_t + \delta_k + \varepsilon_{jt} \tag{6}$$

where i indexes an individual in a particular sector j at time t. In these individual level

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[4]Given the relatively restricted variation in $TotDem$ - we only have data for three years and 65 individual sectors - including fixed effects at the individual sectoral level (j) absorbs a significant chunk of the identifying variation. As a result, we include fixed effects for broad sector groups k as opposed to individual sector level effects. We include effects for 8 broadly defined industries such as agriculture, forestry and fishing and mining. Note that our empirical strategy does not rely on variation in exports within each individual sector. Rather, it relies on exogenous variation across sectors in export demand to identify the impacts of interest.

specifications, we also include a vector of individual level controls X_i such as gender, age, marital status, education level and an indicator for residence in an urban area. For age, we create 5 age groups defined as follows: 15 to 29, 30 to 44, 45 to 59, 50 to 75 and 75 and above. Similarly, we create 5 categories of educational attainment: no education, grades 1 to 5, grades 6 to 9, secondary to intermediate (i.e. grades 10 to 12) and college graduate and above. Our indicators for marital status include categories for being married, separated or single. The dependent variable for (5) is an indicator for an individual being employed as formal, informal, unpaid or self-employed labor. To explore heterogeneity by demographic characteristics, we interact $TotDem$ in specification (5) with indicators for gender or educational attainment in separate regressions. Here too, standard errors are clustered at the sector level j.

$TotDem$ is clearly endogenous in these regressions. For instance, due to social or political pressures, OECD countries might choose to import more from sectors which have formalized more. This generates reverse causality between employment in a particular category and exports. Alternatively, sector-specific unobservables might confound our results. To take a simple example, Bangladesh has built up a lot of capital (human as well as physical) for making garments which might be unobserved. This could affect exports to the OECD and also drive domestic volume of production, affecting employment. We also note that $TotDem$ is likely to be measured with error, necessitating an IV strategy.

To construct our instrumental variable, we use the intuition that intra-OECD exports reflect cross-sector demand preferences in the OECD which are likely to be independent of supply side factors in Bangladesh.[5] It is possible that intra-OECD trade might be a weak predictor of Bangladeshi exports to the OECD due to differences in the structure of trade between developed and developing countries. As a robustness check, we use exports from low and middle income East Asian and Pacific (EAP) countries to the OECD as an alternative instrument for Bangladesh's exports to the OECD. Since our specifications use the total demand effect of Bangladeshi exports calculated by multiplying sector-level exports with the Leontief inverse based on Bangladesh's IO matrix, we construct our instrument by multiplying sector-level intra-OECD exports (or EAP exports) by the same Leontief inverse.

3. Data

3.1 Data Sources

Our data on the Bangladeshi labor force comes from the Bangladesh Labor Force Surveys (LFS). The LFS is a nationally representative sample containing information on workers

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[5]Acemoglu et al. (2014) use a similar intuition: to instrument for Chinese exports to the US, they use exports from China to a set of high income countries other than the United States.

across all industries and occupational categories. Importantly, the LFS also contains information on the types of jobs in which individuals are engaged (i.e. formal, informal, unpaid or self-employed). We use data from three waves of the survey (2002, 2005 and 2010). Our analysis is thus conducted on a pooled cross-sections of workers from these years.

In the analysis that follows, we restrict our sample to employed workers. We define an employed worker as those who either worked for at least one hour in the past 7 days or if they did not work in the past 7 days, they were attached to a job or business. We define employment categories using responses about employment status. We categorize a worker as formal labor if he/she reported working as an "employer" or "regular paid employee". Those who report being "unpaid family workers" are categorized as unpaid labor. The self-employed are defined as those who report their status as "own account worker/self-employed" and we categorize as informal labor those who report their status as "paid casual workers/day laborers", "domestic workers" or "paid/unpaid apprentices". In the event that a given worker reports multiple jobs, we only use information on their main activity i.e. the activity where the worker spent most of his/her time.

Our trade data comes from UN Comtrade. For the years 2002, 2005 and 2010, we extract data on exports (at the 6 digit HS 1996 product category level) from Bangladesh to all OECD countries. This is the primary trade variable used in our analysis. For the instrumental variables analysis, we also extract export data on intra-OECD exports and exports from low and middle income East Asian and Pacific countries to the OECD .

The final piece of data we use is the IO matrix for Bangladesh for the year 2007. It is important to note that while the rest of our data vary over time, we fix the IO coefficients at the year 2007. We do this to account for the fact that the structure of inter-industry linkages might react endogenously to changes in exports. The IO matrix presents linkages between 86 sectors ranging from agriculture (e.g. paddy cultivation, jute cultivation) to manufacturing (e.g. pharmaceuticals, fertilizers, chemicals) and services (e.g. professional services, communication). For each of these 86 sectors, the matrix presents the monetary value of inputs drawn from all sectors of the economy. The matrix also provides the value added by each sector, imports for that sector, import duty and total supply from that sector. To take a concrete example: In 2007, the total supply of wheat cultivation in

Bangladesh was 46,960 million Taka. Of this total, the input use from other sectors was 9,624 mn Taka: 4,434 mn from wheat cultivation, 67 mn from livestock rearing, 926 mn from fertilisers, 391 mn from petroleum refining, 77 mn from machinery and equipments, 60 mn from electricity and water generation, 787 mn from wholesale trade, 1406 mn from retail trade, 105 mn from water transport, 1101 mn from land transport, 16 mn from railway transport, 4 mn from public administration and defense, 11 mn from bank insurance and real estate, 1 mn from professional services and 238 mn from other services.

In addition to this input use, the wheat cultivation industry itself provided 6,659 mn Taka of value added. The sector had 29, 449 mn in imports and 1,228 mn in import duty.

To calculate the matrix of input use coefficients (matrix B in equation (1)), we divide the input use amounts by the gross output of the sector (i.e. outputs before imports). Returning to the example above, the input use coefficients for wheat cultivation are calculated by dividing the monetary inputs from each sector (i.e. 4,454 mn wheat cultivation itself, 67 mn from livestock rearing, 926 mn from fertilisers, ...) by the gross output for the wheat cultivation sector (16,283 mn which is the sum of 9,624 mn in input use and 6,659 mn in value added).

3.2 Concordances

Each component of our data has a different classification scheme. The trade data uses 6 digit HS 1996 product categories. The LFS data uses 4 digit Bangladesh Standard Industrial Classification (BSIC) codes to identify worker industries.[6] Finally, the IO matrix described above contains a different set of 86 sectoral IO codes. To harmonize across these sources, we create cross-walks between these different classification schemes.

We map both the labor force and trade data to the sectoral IO codes. In order to merge the LFS data with the sectoral IO information, we first aggregate the 86 IO sector codes to 65 consolidated IO sector codes, to ensure that each BSIC code maps to an unique IO sector.[7] After creating these consolidated IO sector codes, we allocate each 4 digit BSIC code (separately for Revision 3 and Revision 4) to one of the 65 consolidated IO sectors. In order to match our trade data with the IO sector codes, we carry out a similar mapping exercise: we first map 6 digit HS 1996 codes to 4 digit HS 2002 codes (using concordances provided by UN Comtrade). Next, we used reported HS 2002 and IO sector mappings for Bangladesh (Policy Research Institute of Bangladesh, 2014) to map the export data to the IO sector codes. Since our analysis is conducted using consolidated IO codes, we first calculate total export demand at the 86 code level and then aggregate up to the consolidated IO sector level. In the results reported below, IO sectors refers to the consolidated IO codes.

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[6]Two waves of the LFS data (2002 and 2005) use the BSIC Revision 3 classification and 2010 uses the BSIC Revision 4 classification.

[7]For example, BSIC Rev 3 code 111 refers to "Growing of cereal crops". On IO sector side, we have three categories that BSIC 111 could be mapped to: "Paddy Cultivation", "Wheat Cultivation" and "Other Grain Cultivation". We consolidate these three IO codes into one code, "Grain Cultivation" and map BSIC 111 to this sector.

4. Results

4.1 Sector level analysis

Table 1 presents aggregate statistics for our sample. Over the three years, 2002, 2005 and 2010, Bangladesh's exports to the OECD (in 2010 US$) grew substantially, from 5.82 bn to 16.7 bn. Ready made garments and knitting accounted for about 85 percent of these exports across all three years. Table 1 also shows how these overall exports translate into direct and indirect export demand. Recall that direct export demand reflects a sector's demand for its own output and indirect export demand reflects demand for a sector's output emanating from other sectors. Direct export demand was 6.36 bn US$ in 2002, 9.73 bn US$ in 2005 and 17.7 bn US$ in 2010. These direct export demands combine both the initial export amount as well as the additional demand created by a sector for its own output. We expect the export and direct demand figures to track each other fairly closely since sectors generally use a small portion of their own output.

Indirect export demand is, in fact, larger than the direct component: from 2002 to 2010, the indirect component increased from 6.79 billion US$ to 19.4 billion US$. The substantial size of the indirect demand underscores the importance of accounting for sectors that themselves might not export but have supply relationships to exporting sectors. For instance, while ready made garments and knitting accounts for the majority of observed exports, they account for a negligible portion of the indirect export demand. Instead, indirect demand is driven by sectors such as wholesale and retail trade, cloth milling, jute cultivation and land transport. To underscore this point, Figure 2 presents a scatterplot of exports and indirect demand for the base year in our sample, 2002. On one end of the spectrum are industries like ready-made garments with large amounts of exports (3.1 bn US$ for ready made garments) but no indirect demand. At the other end, we have industries like wholesale and retail trade with zero exports but sizable indirect demand (1.7 bn US$). In defining total export demand (i.e. *TotDem* in equations (5) and (6)), we add direct and indirect export demands.

Table 1 also presents employment figures for the three years in our sample. These numbers provide some initial motivation for the observation that export growth need not always result in a shift away from formal employment. First, formal employment accounts for the lowest share of employment (approximately 14 percent) and remains more or less constant across the three years. Rather, self employment represents the dominant mode of employment in Bangladesh. In 2002, 2005 and 2010, it accounted for 45.3 percent, 42.2 percent and 40.3 percent of overall employment, respectively. Informal and unpaid employment each account for approximately 20 percent of overall employment. Of course, it might be the case that our timespan, 2002 to 2010, reflects a relatively short timeframe for observing adjustments in the formal/informal composition of the labor

market. Nevertheless, the rapid rise in exports from 2002 to 2010 and the absence of any reallocation toward formal employment (at least in aggregate) motivates the analysis that follows.

We begin by presenting scatterplots between between log of total export demand of Bangladesh's exports to the OECD and log of employment (by employment categories) in Figure 3.[8] Across the board, increasing export demand is positively associated with employment levels. This is consistent with the notion that export growth creates employment opportunities (e.g. Fu and Balasubramanyam, 2005; Fukase, 2013). This positive relationship is also reflected in the regression results. Table 2 presents results of specification (5). For each category of employment, we first present OLS results followed by our IV results, where we instrument Bangladesh's exports to the OECD using intra-OECD exports. The OLS results reflect the graphical evidence presented in Figure 3: a 1 percent increase in total export demand is associated with a 0.26 percent increase in formal employment, a 0.2 percent increase in informal employment, a 0.23 percent increase in unpaid employment and a 0.32 percent increase in self employment.

The IV results are qualitatively similar to the OLS results.[9]Quantitatively, we see the largest impacts on self employment (elasticity of 0.6) and unpaid employment (elasticity of 0.5) employment. The fact that unpaid employment levels respond to export demand is likely because these workers are unpaid family workers in household businesses; therefore, as self-employment grows, so does unpaid family employment.

As a robustness check, we replicate the results of Table 2, replacing intra-OECD exports as an instrument with exports from low and middle income East Asian and Pacific countries to the OECD. Table 3 presents the results of this analysis, and indicates that the results are similar in magnitude and significance.

We are also interested in examining the impact of total export demand on the allocation of different types of employment. While we perform this exercise in more detail using individual level regressions in the next section, as a precursor, we replace the dependent variable of specification (5) with employment shares. Figure 4 presents scatterplots of the relationship between employment shares and log of total export demand. In contrast to the patterns we observe for employment levels, there is only a weak association between

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[8]For the employment level analysis that follows, we take a log transformation without adding one to zero values. This drops IO sector - year cells which have zero employment for a particular employment type. Further, in constructing the sector-year level total export demand, we have three sectors which exhibit no supply links to other sectors in the 2007 Bangladesh IO matrix (Entertainment, Education Service and Handloom Cloth). We also observe no exports for these sectors. Finally, in merging LFS data with the IO sector codes, one sector is dropped for one year since we don't observe the associated BSIC codes in the LFS data for that year. Consequently, we have 185 IO sector-year combinations instead of the full 195.

[9]Our first-stage results indicate that intra-OECD exports is strongly predictive of exports from Bangladesh to the OECD. With the exception of unpaid employment, the first stage F stats are well above the conventional threshold of 10.

export demand and formal and unpaid employment shares. Export demand exhibits a negative association with informal employment share and a positive association with self employment share. Moving to the regression results in Table 4, the IV estimates suggest a negative, but statistically insignificant, relationship between export demand and the shares of formal and informal employment. However, a one percent increase in total export demand increases the share of self-employment by 0.03 percentage points and the share of unpaid employment by 0.01 percentage points. Table 5 presents similar estimates using exports from EAP countries as an instrument. Here too, we don't find much difference in the margnitudes of the estimates and significance levels.

4.2 Individual level analysis

The results of the sector level analysis suggest that the most salient impact of total export demand on employment shares is for self and unpaid employment. To explore this further, we move to an individual level specification (i.e. specification (6)). In addition, we explore heterogeneity in effects by educational attainment and gender. Export expansions might have differential effects along demographic lines such as gender and education. For instance, worker mobility across sectors (or employment types) might be driven by factors such as educational attainment (Dix-Carneiro, 2014). Examining responses by educational attainment also allows us to build a more precise picture of the skill profile of workers affected by increased export demand. In particular, if effects are driven by individuals with relatively high levels of education, this would imply that export expansion might allow for high-skill entrepreneurial ventures. On the other hand, if these effects are concentrated at the lower end of the educational spectrum, this might suggest less skill-intensive growth in this sector. Heterogeneity in effects along gender lines is also an important margin to consider in Bangladesh since, as recent evidence indicates, export driven growth in the country has resulted in increased female labor force participation (Heath and Mobarak, 2015).

We begin by presenting weighted summary statistics on the individual level sample across 2002, 2005 and 2010 in Table 6. About a quarter of the sample are female. Our sample is tipped towards a younger population: approximately three-quarters of our sample is between the ages of 15 to 44 years. The sample is also tipped towards lower education levels: 44 percent have no education and 22 perecent only have education between grades 1 and 5. For brevity, in the individual level analysis that follows, we presents unweighted regression results. Tables 1 to 4 in the Appendix presents weighted regression results. The two sets of results are fairly close. Results of specification (6) are presented in Tables 7 to 10. In each table, the first column presents the OLS estimate, the second column presents the IV estimate. Columns 3 and 4 present estimates for total export demand interacted with gender indicators and educational attainment indicators in sep-

arate specifications. For the interaction regressions, we interact the instrument with the demographic indicators.

We begin with the results for formal employment in Table 7. The IV estimates indicate that total export demand decreases the likelihood of being formally employed. The gender interaction (which is insignificant) indicates that this effect is equally split across genders, with the point estimate for males (-0.0470) fairly close to the estimate for females (-0.0514). The education interaction (jointly insignificant) indicates that the effect of total export demand is likely strongest for those with lower levels of educational attainment. Turning to the results for informal employment (Table 8), we observe that total export demand also leads to a decrease in the overall likelihood of informal employment (significant at the 10 percent level). The gender interaction is significant and indicates that the negative effect of export demand is driven by males. The education interaction is also jointly significant and indicates that export demand reduces informality for the less educated. One surprising result in Table 8 is that export demand *increases* informal employment for individuals with a college education or above, although this result may be driven by the fairly low prevalence of college graduates in informal employment in the sample.

Table 9 presents results for unpaid workers. Although the overall effect of total export demand is not statistically significant (column 2), we do observe an increase in unpaid employment for men (gender interaction significant). The education interaction for unpaid employment in not jointly significant. Table 10 presents results for the self-employed. Overall, we see a strong, positive impact of total export demand on the likelihood of being self employed. A one percent increase in total export demand leads to a 0.05 percentage point increase in the likelihood of being self-employed. The effect is higher for females than males (0.07 percentage points versus 0.04 percentage points; interaction signifcant at the 10 percent level). Also, these effects concentrated at the bottom of the education spectrum. Indeed, it seems that the effects of total export demand decrease with increasing levels of education (education interactions are jointly significant at the 10 percent level). Tables 11 to 14 recreate the results presented above with exports from low and middle income East Asian and Pacific countries as the instrument. For formal employment, we see an attenuation of the overall effect (0.05 percentage points using intra-OECD exports as IV versus 0.02 percentage points using EAP exports as IV). The results also decline in statistical signficiance. However, the overall direction of effects still hold. For informal, unpaid and self employment, the two sets of results are fairly close in terms of both magnitude and signficance.

5. Conclusion

Several decades ago, Lucas (1978) noted that the process of economic growth will tend to shift the balance of employment in an economy away from self-employment towards formal employment. The impetus for this change would come from rising real wages increasing the opportunity cost of self employment and creating incentives for participating in the formal sector. We study this question in the context of Bangladesh. Specifically, we examine the effects of expansions in export demand on formal, informal, unpaid and self employment. We take supply links into account by using Bangladesh's input-output matrix to calculate the effect of export demand on sectors which themselves do not export but have supply links to exporting sectors. Further, we address the endogeneity of exports by using international trade patterns.

Our results suggest that export led growth increases the levels of employment across all four employment categories. However, we also find that export growth causes a reallocation of labor away from formal and informal employment towards self employment. The shift towards self-employment is particularly strong for women and those with lower levels of education. These results stand in contrast to the conventional view that as economies grow, the non-formal sector shrinks and the formal sector expands and suggest that the informal sector - and in particular self employment - may play an important role in growth.

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Figures

Figure 1: Exports and employment share
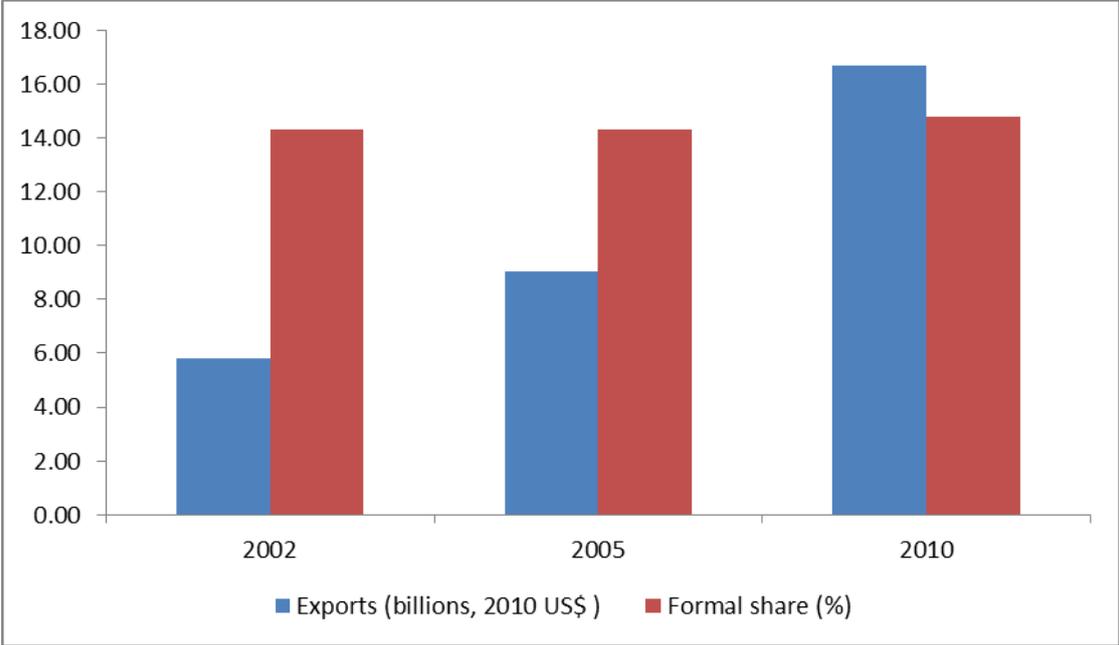
Notes: The graph presents Bangladesh's exports to the OECD and formal share of employment in Bangladesh. Export data comes from UN Comtrade and employment data comes from the Bangladesh Labor Force Survey (LFS). LFS weights are used to calculate the formal share of employment. Exports are deflated to 2010 US$ using the US CPI.

Figure 2: Exports and indirect demand, 2002
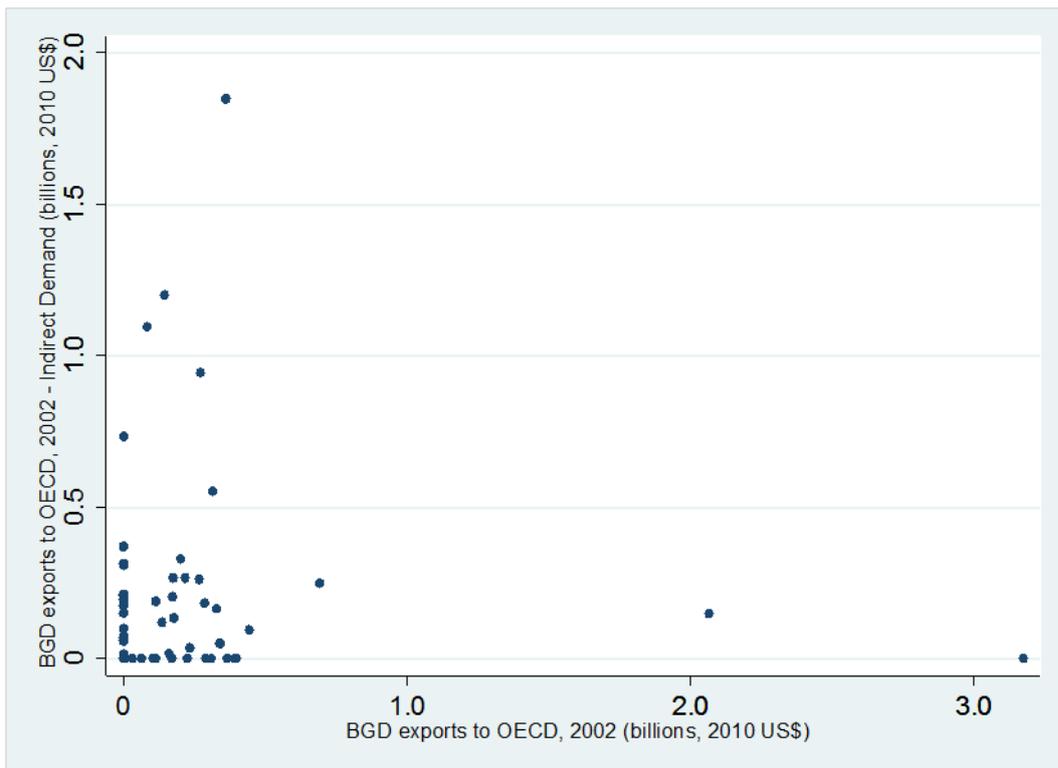
Notes: The graph presents a scatterplot of Bangladesh's exports to the OECD against the indirect demand effect of these exports for the year 2002. Each point represents an IO sector. Export data comes from UN Comtrade. Indirect demand effects are calculated using the Bangladesh IO matrix for 2007. Monetary amounts are deflated to 2010 US$ using the US CPI.

Figure 3: Employment levels and total export demand
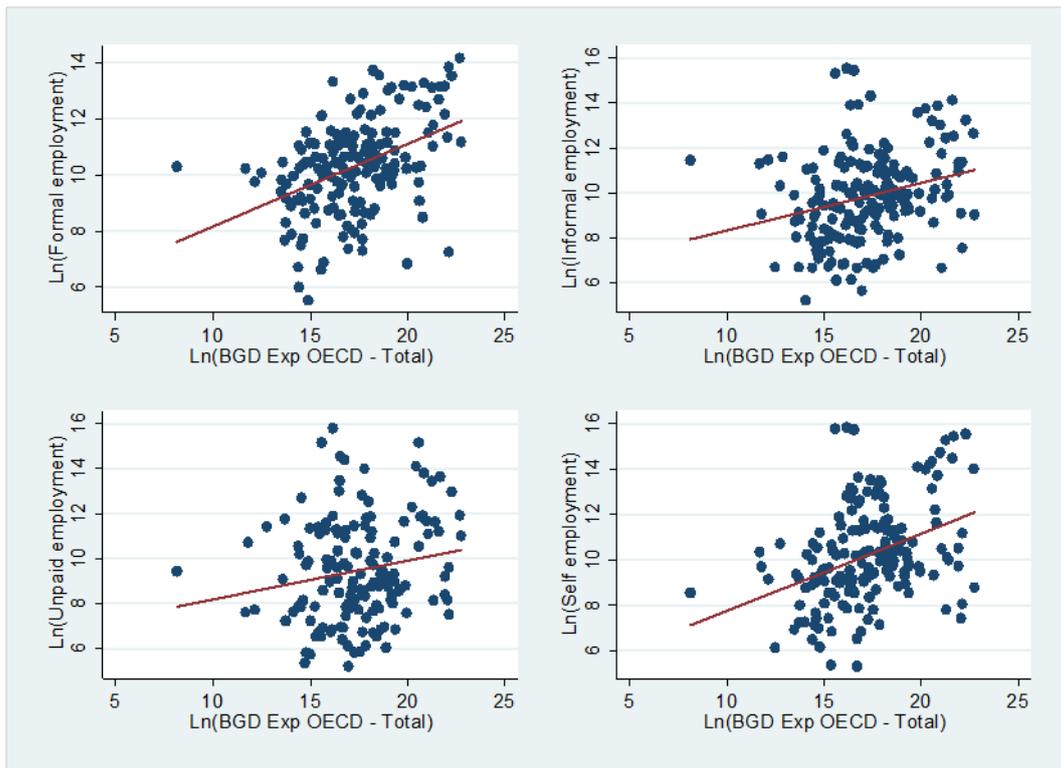
Notes: The graphs above present scatterplots of the log of employment against the log of total export demand of Bangladeshi exports to the OECD for the four employment categories. Data is pooled across the years 2002, 2005 and 2010. Total export demand is calculated using the 2007 Bangladesh IO matrix. LFS weights are used to calculate employment numbers. Each point represents an IO sector-year combination. Monetary amounts are deflated to 2010 US$ using the US CPI. Export data comes from UN Comtrade and employment data comes for the Bangladesh LFS.

Figure 4: Employment share and total export demand
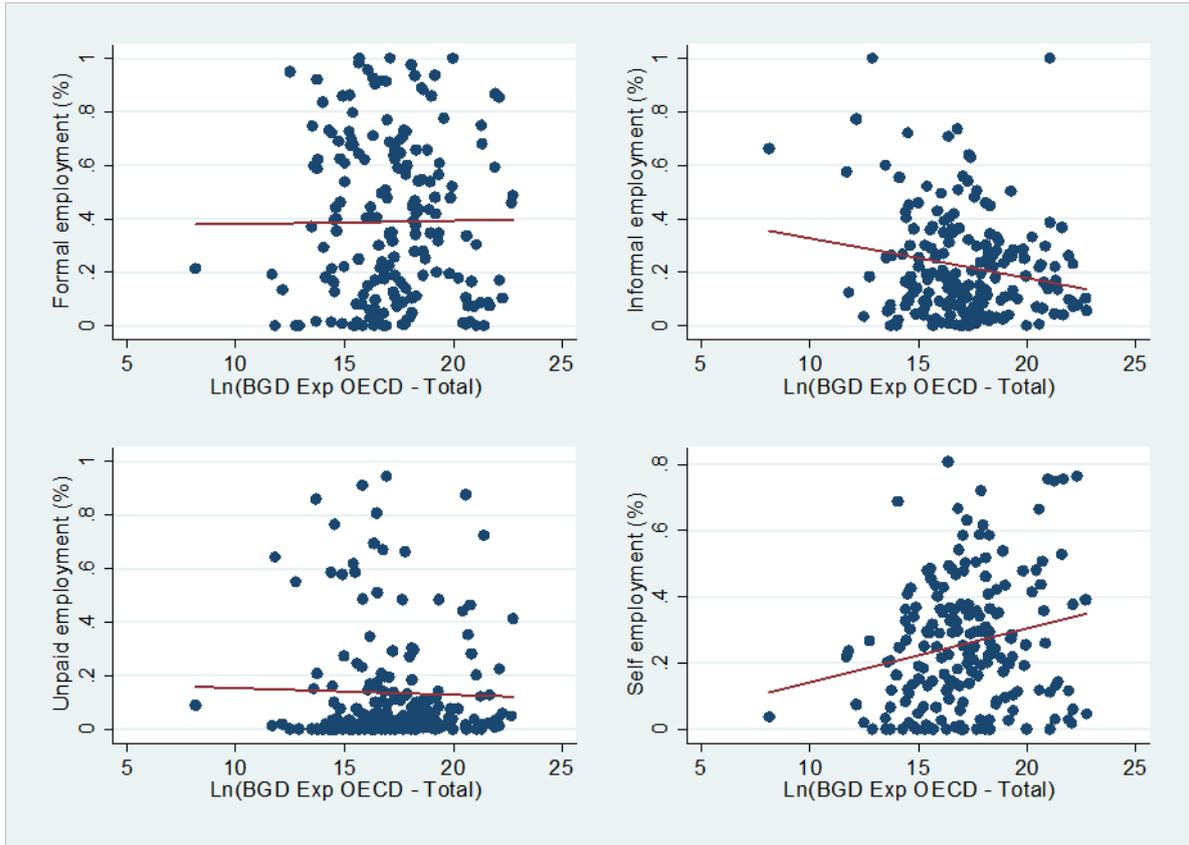
Notes: The graphs above present scatterplots of employment share against the log of total export demand of Bangladeshi exports to the OECD for the four employment categories. Data is pooled across the years 2002, 2005 and 2010. Total export demand is calculated using the 2007 Bangladesh IO matrix. LFS weights are used to calculate employment shares. Each point represents an IO sector-year combination. Monetary amounts are deflated to 2010 US$ using the US CPI. Export data comes from UN Comtrade and employment data comes for the Bangladesh LFS.

Tables

Table 1: Aggregate statistics

	2002	2005	2010
Export (billion, 2010 US$)	5.82	9.05	16.7
Direct Demand (billion, 2010 US$)	6.36	9.73	17.7
Indirect Demand (billion, 2010 US$)	6.79	9.72	19.4
Formal Employment (million)	6.25	6.7	7.98
Informal Employment (million)	9.55	10.1	12.5
Unpaid Employment (million)	8.14	10.3	11.8
Self Employment (million)	19.8	19.8	21.8

Notes: Table presents aggregate statistics for our sample. LFS weights are used to calculate employment figures. The 2007 IO matrix for Bangladesh is used to calculate direct and indirect demand components of exports. Monetary amounts are deflated to 2010 US$ using the US CPI. Export data comes from UN Comtrade and employment data comes from the Bangladesh LFS.

Table 2: Impact of total export demand on employment levels

	1		2		3		4	
	Ln (Formal Emp)		Ln (Informal Emp)		Ln (Unpaid Emp)		Ln (Self Emp)	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Ln (Total Demand)	0.262***	0.302**	0.204**	0.198*	0.234***	0.542***	0.321***	0.638***
	(0.0806)	(0.130)	(0.0999)	(0.118)	(0.0827)	(0.172)	(0.0989)	(0.132)
First stage results								
Ln (Intra OECD Demand)		0.456***		0.481***		0.476***		0.479***
		(0.113)		(0.121)		(0.173)		(0.133)
F test of excluded instruments		16.33		15.82		7.56		12.95
Observations	171	171	176	176	146	146	169	169

Notes: Table above presents results for the impact of log total export demand of Bangladesh's exports to the OECD on log of employment for the four employment categories. Analysis is conducted at the IO sector-year level. First, OLS results are presented followed by IV results. Intra-OECD exports are used to instrument for Bangladesh's exports to the OECD. First stage results are also presented for the IV columns. Each specification contains year fixed effects and fixed effects for 8 broad sectors (agriculture, forestry and fishing; mining and quarrying; manufacturing; electricity, gas and water; trade, hotel and restaurants; transportation storage and communication; other services). LFS weights are used to calculate employment numbers at the sector level. Standard errors are clustered at the IO sector level. *** p<0.01, ** p<0.05, * p<0.1.

Table 3: Impact of total export demand on employment levels (alternate instrument)

	Ln (Formal Emp) IV	Ln (Informal Emp) IV	Ln (Unpaid Emp) IV	Ln (Self Emp) IV
Ln (Total Demand)	0.287***	0.204**	0.400***	0.476***
	(0.0947)	(0.1000)	(0.129)	(0.118)
First Stage Results				
Ln (EAP Demand)	0.666***	0.704***	0.711***	0.709***
	(0.161)	(0.169)	(0.236)	(0.184)
F test of excluded instruments	17.05	17.34	9.05	14.77
Observations	171	176	146	169

Notes: Table above recreates the results of Table 2 using exports from low and middle income EAP countries to the OECD as instrument for Bangladesh's exports to the OECD. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 4: Impact of total export demand on employment share

	1 Formal Share		2 Informal Share		3 Unpaid Share		4 Self Share	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Ln (Total Demand)	0.000718	-0.0271	-0.0147*	-0.0187	0.00505	0.0136**	0.00896	0.0322***
	(0.0109)	(0.0169)	(0.00880)	(0.0121)	(0.00339)	(0.00545)	(0.00711)	(0.0124)
First stage results								
Ln (Intra OECD Demand)		0.475***		0.475***		0.475***		0.475***
		(0.114)		(0.114)		(0.114)		(0.114)
F test of excluded instruments		17.47		17.47		17.47		17.47
Observations	185	185	185	185	185	185	185	185

Notes: Table above presents results for the impact of log total export demand of Bangladesh's exports to the OECD on employment share for the four employment categories. Analysis is conducted at the IO sector-year level. First, OLS results are presented followed by IV results. Intra-OECD exports are used to instrument for Bangladesh's exports to the OECD. First stage results are also presented for the IV columns. Each specification contains year fixed effects and fixed effects for 8 broad sectors (agriculture, forestry and fishing; mining and quarrying; manufacturing; electricity, gas and water; trade, hotel and restaurants; transportation storage and communication; other services). LFS weights are used to calculate employment figures at the sector level. Standard errors are clustered at the IO sector level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 5: Impact on total export demand on employment share (alternate instrument)

	Formal Share IV	Informal Share IV	Unpaid Share IV	Self Share IV
Ln (Total Demand)	-0.0153	-0.0178*	0.0101**	0.0230**
	(0.0142)	(0.00972)	(0.00405)	(0.00954)
First Stage Results				
Ln (EAP Demand)	0.687***	0.687***	0.687***	0.687***
	(0.157)	(0.157)	(0.157)	(0.157)
F test of excluded instruments	19.12	19.12	19.12	19.12
Observations	185	185	185	185

Notes: Table above recreates the results of Table 4 using exports from low and middle income EAP countries to the OECD as instrument for Bangladesh's exports to the OECD. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 6: Summary Statistics (Individual Level Sample)

	Obs	Mean	Std. Dev.
Formal	200,365	0.144	0.351
Informal	200,365	0.222	0.416
Unpaid	200,365	0.208	0.406
Self	200,365	0.425	0.494
Female	201,732	0.256	0.436
Age Categories			
15 - 29 years	201,732	0.366	0.482
30 - 44 years	201,732	0.366	0.482
45 - 59 years	201,732	0.194	0.395
60 - 74 years	201,732	0.066	0.248
75 and above	201,732	0.008	0.089
Marital Status			
Married	201,730	0.789	0.408
Separated	201,730	0.032	0.177
Single	201,730	0.178	0.383
Education Level			
None	201,534	0.439	0.496
Class 1 - 5	201,534	0.216	0.411
Class 6 - 9	201,534	0.209	0.406
Second-Inter	201,534	0.094	0.292
Graduate & above	201,534	0.043	0.203

Notes: Table above presents summary statistics for the individual level analysis. Data comes from the Bangladesh LFS and summary statistics are weighted using LFS weights.

Table 7: Impact of total export demand on individual likelihood of formal employment

	Formal Employment			
	1	2	3	4
	OLS	IV	IV	IV
Ln (Total Demand)	0.00192	-0.0484**		
	(0.00938)	(0.0207)		
First Stage Results				
Ln (Intra OECD Demand)		0.762***		
		(0.198)		
F test of excluded instruments		14.78		
Ln (Total Demand) by				
Male			-0.0470**	
			(0.0201)	
Female			-0.0514**	
			(0.0243)	
Ln (Total Demand) by				
None				-0.0500**
				(0.0207)
Class 1 - 5				-0.0468**
				(0.0212)
Class 6 - 9				-0.0450**
				(0.0220)
Secondary-Intermediate				-0.0523*
				(0.0269)
Graduate & above				-0.0483
				(0.0383)
Observations	192,644	192,644	192,644	192,644

Notes: Table above presents results for the impact of total export demand on individual likelihood of formal employment. Regressions are unweighted. Intra OECD exports serve as instrument for Bangladesh's exports to the OECD. Controls include age, gender, education, marital status and indicator for residing in an urban area. Specifications also include year fixed effects and fixed effects for 8 broad industry groups (defined in the same way as the sector-level analysis). Standard errors are clustered at the sector level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 8: Impact of total export demand on individual likelihood of informal employment

	Informal Employment			
	1	2	3	4
	OLS	IV	IV	IV
Ln (Total Demand)	-0.0241***	-0.0158*		
	(0.00472)	(0.00866)		
First Stage Results				
Ln (Intra OECD Demand)		0.762***		
		(0.198)		
F test of excluded instruments		14.78		
Ln (Total Demand) by				
Male			-0.0238**	
			(0.00943)	
Female			0.00120	
			(0.0129)	
Ln (Total Demand) by				
None				-0.0327***
				(0.0104)
Class 1 - 5				-0.0161**
				(0.00744)
Class 6 - 9				-0.00164
				(0.00674)
Secondary-Intermediate				0.0124
				(0.00775)
Graduate & above				0.0302***
				(0.0114)
Observations	192,644	192,644	192,644	192,644

Notes: Table above presents results for the impact of total export demand on individual likelihood of informal employment. Regressions are unweighted. Intra OECD exports serve as instruments for Bangladesh's exports to the OECD. Controls include age, gender, education, marital status and indicator for residing in an urban area. Specifications also include year fixed effects and fixed effects for 8 broad industry groups (defined in the same way as the sector level analysis). Standard errors are clustered at the sector level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 9: Impact of total export demand on individual likelihood of unpaid employment

| | Unpaid Employment | | | |
| | 1 | 2 | 3 | 4 |
	OLS	IV	IV	IV
Ln (Total Demand)	0.00393	0.0145		
	(0.00969)	(0.00969)		
First Stage Results				
Ln (Intra OECD Demand)		0.762***		
		(0.198)		
F test of excluded instruments		14.78		
Ln (Total Demand) by				
Male			0.0291**	
			(0.0134)	
Female			-0.0164	
			(0.0165)	
Ln (Total Demand) by				
None				0.0203**
				(0.00950)
Class 1 - 5				0.0143
				(0.00982)
Class 6 - 9				0.00760
				(0.0103)
Secondary-Intermediate				0.00626
				(0.0110)
Graduate & above				0.00865
				(0.00869)
Observations	192,644	192,644	192,644	192,644

Notes: Table above presents results for the impact of total export demand on individual likelihood of unpaid employment. Regressions are unweighted. Intra OECD exports serve as instrument for Bangladesh's exports to the OECD. Controls include age, gender, education, marital status and indicator for residing in an urban area. Specifications also include year fixed effects and fixed effects for 8 broad industry groups (defined in the same way as the sector level analysis). Standard errors are clustered at the sector level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 10: Impact of total export demand on individual likelihood of self employment

| | Self Employment | | | |
| | 1 | 2 | 3 | 4 |
	OLS	IV	IV	IV
Ln (Total Demand)	0.0183**	0.0497***		
	(0.00774)	(0.0180)		
First Stage Results				
Ln (Intra OECD Demand)		0.762***		
		(0.198)		
F test of excluded instruments		14.78		
Ln (Total Demand) by				
Male			0.0417**	
			(0.0172)	
Female			0.0666***	
			(0.0243)	
Ln (Total Demand) by				
None				0.0624***
				(0.0187)
Class 1 - 5				0.0486**
				(0.0192)
Class 6 - 9				0.0391*
				(0.0201)
Secondary-Intermediate				0.0336
				(0.0210)
Graduate & above				0.00944
				(0.0293)
Observations	192,644	192,644	192,644	192,644

Notes: Table above presents results for the impact of total export demand on individual likelihood of self employment. Regressions are unweighted. Intra OECD exports serve as instrument for Bangladesh's exports to the OECD. Controls include age, gender, education, marital status and indicator for residing in an urban area. Specifications also include year fixed effects and fixed effects for 8 broad industry groups (defined in the same way as the sector level analysis). Standard errors are clustered at the sector level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 11: Impact of total export demand on individual likelihood of formal employment (alternate instrument)

	Formal Employment		
	1	2	2
	IV	IV	IV
Ln (Total Demand)	-0.0221*		
	(0.0133)		
First Stage Results			
Ln (Intra OECD Demand)	1.072***		
	(0.213)		
F test of excluded instruments	25.32		
Ln (Total Demand) by			
Male		-0.0242**	
		(0.0116)	
Female		-0.0184	
		(0.0178)	
Ln (Total Demand) by			
None			-0.0255*
			(0.0134)
Class 1 - 5			-0.0193
			(0.0141)
Class 6 - 9			-0.0164
			(0.0148)
Secondary-Intermediate			-0.0245
			(0.0205)
Graduate & above			-0.0266
			(0.0288)
Observations	192,644	192,644	192,644

Notes: The table above recreates the results of Table 7 using exports from low and middle income East Asian and Pacific countries to the OECD as an instrument for Bangladesh's exports to the OECD. *** p<0.01, ** p<0.05, * p<0.1.

Table 12: Impact of total export demand on individual likelihood of informal employment (alternate instrument)

	Informal Employment		
	1	2	2
	IV	IV	IV
Ln (Total Demand)	-0.0205***		
	(0.00605)		
First Stage Results			
Ln (Intra OECD Demand)	1.072***		
	(0.213)		
F test of excluded instruments	25.32		
Ln (Total Demand) by			
Male		-0.0287***	
		(0.00653)	
Female		-0.00601	
		(0.0104)	
Ln (Total Demand) by			
None			-0.0374***
			(0.00730)
Class 1 - 5			-0.0207***
			(0.00567)
Class 6 - 9			-0.00653
			(0.00538)
Secondary-Intermediate			0.00693
			(0.00651)
Graduate & above			0.0214**
			(0.0103)
Observations	192,644	192,644	192,644

Notes: The table above recreates the results of Table 8 using exports from low and middle income East Asian and Pacific countries to the OECD as an instrument for Bangladesh's exports to the OECD. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 13: Impact of total export demand on individual likelihood of unpaid employment (alternate instrument)

	Unpaid Employment		
	1	2	2
	IV	IV	IV
Ln (Total Demand)	0.00769		
	(0.00816)		
First Stage Results			
Ln (Intra OECD Demand)	1.072***		
	(0.213)		
F test of excluded instruments	25.32		
Ln (Total Demand) by			
Male		0.0220**	
		(0.00874)	
Female		-0.0178	
		(0.0175)	
Ln (Total Demand) by			
None			0.0147*
			(0.00847)
Class 1 - 5			0.00621
			(0.00851)
Class 6 - 9			-0.000339
			(0.00844)
Secondary-Intermediate			-0.000440
			(0.00821)
Graduate & above			0.00299
			(0.00551)
Observations	192,644	192,644	192,644

Notes: The table above recreates the results of Table 9 using exports from low and middle income East Asian and Pacific countries to the OECD as an instrument for Bangladesh's exports to the OECD. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 14: Impact of total export demand on individual likelihood of self employment (alternate instrument)

	Self Employment		
	1	2	2
	IV	IV	IV
Ln (Total Demand)	0.0350***		
	(0.0119)		
First Stage Results			
Ln (Intra OECD Demand)	1.072***		
	(0.213)		
F test of excluded instruments	25.32		
Ln (Total Demand) by			
Male		0.0309***	
		(0.0106)	
Female		0.0422**	
		(0.0182)	
Ln (Total Demand) by			
None			0.0482***
			(0.0132)
Class 1 - 5			0.0337***
			(0.0130)
Class 6 - 9			0.0232*
			(0.0137)
Secondary-Intermediate			0.0180
			(0.0151)
Graduate & above			0.00224
			(0.0215)
Observations	192,644	192,644	192,644

Notes: The table above recreates the results of Table 10 using exports from low and middle income East Asian and Pacific countries to the OECD as an instrument for Bangladesh's exports to the OECD. *** p<0.01, ** p<0.05, * p<0.1.

Appendix

Table 1: Weighted results for impact of total export demand on individual likelihood of formal employment

	Formal Employment			
	1	2	3	4
	OLS	IV	IV	IV
Ln (Total Demand)	0.00563	-0.0465**		
	(0.00957)	(0.0202)		
Ln (Total Demand) by				
Male			-0.0456**	
			(0.0195)	
Female			-0.0484**	
			(0.0235)	
Ln (Total Demand) by				
None				-0.0485**
				(0.0204)
Class 1 - 5				-0.0456**
				(0.0207)
Class 6 - 9				-0.0421**
				(0.0213)
Secondary-Intermediate				-0.0484*
				(0.0257)
Graduate & above				-0.0457
				(0.0353)
Observations	192,644	192,644	192,644	192,644

Notes: Table above recreates the results of Table 7 by weighting regressions using weights from the LFS. *** p<0.01, ** p<0.05, * p<0.1.

Table 2: Weighted results for impact of total export demand on individual likelihood of informal employment

	Informal Employment			
	1	2	3	4
	OLS	IV	IV	IV
Ln (Total Demand)	-0.0250***	-0.0155*		
	(0.00467)	(0.00888)		
Ln (Total Demand) by				
Male			-0.0245**	
			(0.00985)	
Female			0.00337	
			(0.0132)	
Ln (Total Demand) by				
None				-0.0325***
				(0.0106)
Class 1 - 5				-0.0154**
				(0.00757)
Class 6 - 9				-0.000150
				(0.00693)
Secondary-Intermediate				0.0119
				(0.00761)
Graduate & above				0.0306***
				(0.0112)
Observations	192,644	192,644	192,644	192,644

Notes: Table above recreates the results of Table 8 by weighting regressions using weights from the LFS. *** p<0.01, ** p<0.05, * p<0.1.

Table 3: Weighted results for impact of total export demand on individual likelihood of unpaid employment

	Unpaid Employment			
	1	2	3	4
	OLS	IV	IV	IV
Ln (Total Demand)	0.00364	0.0175*		
	(0.00946)	(0.00993)		
Ln (Total Demand) by				
Male			0.0325**	
			(0.0141)	
Female			-0.0143	
			(0.0157)	
Ln (Total Demand) by				
None				0.0235**
				(0.00960)
Class 1 - 5				0.0182*
				(0.0101)
Class 6 - 9				0.0103
				(0.0107)
Secondary-Intermediate				0.00733
				(0.0109)
Graduate & above				0.00844
				(0.00901)
Observations	192,644	192,644	192,644	192,644

Notes: Table above recreates the results of Table 9 by weighting regressions using weights from the LFS. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 4: Weighted results for impact of total export demand on individual likelihood of self employment

	Self Employment			
	1	2	3	4
	OLS	IV	IV	IV
Ln (Total Demand)	0.0157**	0.0445***		
	(0.00695)	(0.0165)		
Ln (Total Demand) by				
Male			0.0375**	
			(0.0160)	
Female			0.0593***	
			(0.0222)	
Ln (Total Demand) by				
None				0.0576***
				(0.0171)
Class 1 - 5				0.0428**
				(0.0178)
Class 6 - 9				0.0320*
				(0.0185)
Secondary-Intermediate				0.0291
				(0.0196)
Graduate & above				0.00666
				(0.0259)
Observations	192,644	192,644	192,644	192,644

Notes: Table above recreates the results of Table 10 by weighting regressions using weights from the LFS. *** p<0.01, ** p<0.05, * p<0.1.