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Export Expansion and Labor Market Dynamics in Indonesia

by **Fajar Oktiyanto**, **Riandy Laksono**, and **Yessi Vadila**

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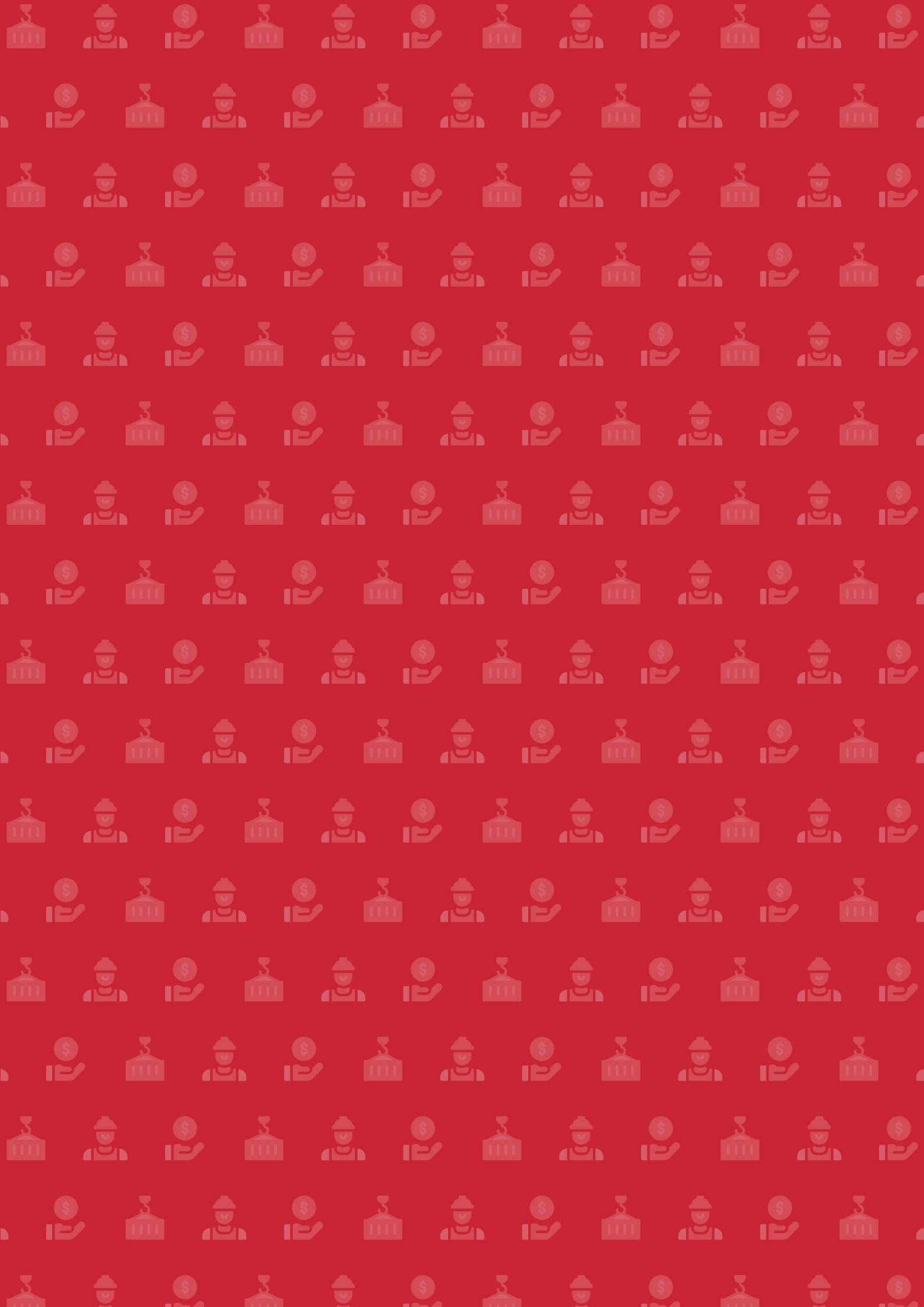

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October, 2024

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Acknowledgement:

We thank the Templeton World Charity Foundation, Inc. (funder DOI 501100011730) for its financial support (for the grant details, see doi.org/10.54224/30486). We thank Shujiro Urata, Wenxiao Wang, and the participants of the Asian Development Bank Institute (ADBI) workshop on Globalization and Equity in Asia for their helpful comments and suggestions and Rahadian Ahmad for his excellent research assistance.

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ABSTRACT

Does export expansion lead to improvements in labor market outcomes? The literature on this topic offers mixed insights. Despite the increasing importance of export markets, informality remains high and inequality continues to worsen in many developing economies. Additionally, export growth driven by commodities has been associated with the Dutch disease phenomenon. This study examines whether broader export expansion, including manufacturing exports alongside commodities, can positively impact labor market outcomes. Using Indonesia, a major commodity-dependent nation, as a case study, we analyze the effects of export expansion during the early 2000s, triggered by the import demand shock in China following its accession to the World Trade Organization (WTO). Our findings indicate that exposure to export expansion led to improvements in formal employment opportunities by 2014. However, the benefits to earnings growth are not uniform; they are observed only in specific cases. Notably, the export expansion episode appears relatively progressive, generating more formal employment opportunities and earnings growth for individuals in the lower- and middle-income brackets. By examining all tradable goods, we identify distinct impacts of different export categories. Our results suggest that the improvements in labor market outcomes are primarily driven by the expansion of manufacturing exports rather than commodities.

JEL Codes: F14, F16, F63, F66, J31, J46

Keywords: export, labor market, informal job, earnings, inequality, Indonesia, People's Republic of China (PRC)

TABLE OF CONTENTS

Table of Contents 6
List of Tables 7
List of Figures 9
Introduction 10
Literature Review 14
Context: How the Rise of the PRC Has Shaped the Exports of Indonesia and Other Developing Countries 16
Methodology 22
Data 26
Results And Discussion 31
- Main Results 31
- Discussion 39
- Role of Internal Migration 42
- Robustness and Sensitivity Test 44

Conclusions and Implications 49
References 51
Appendix 54

LIST OF TABLES

Table 1. The Rise of the PRC: An Import Demand Perspective 15
Table 2. Full IFLS Sample..... 24
Table 3. Balanced IFLS Panel..... 25
Table 4. Differences in Workers' Earnings by Type of JOB..... 25
Table 5. Summary Statistics 28
Table 6. The Impact of Export Expansion to the PRC on Formal Employment and Earnings Growth: OLS and 2SLS Comparison 29
Table 7. The Impact of Export Expansion to the PRC: First-Stage Regression 30
Table 8. The Impact of Export Expansion to the PRC: Robust Confidence Sets 31
Table 9. Formality Split by Individuals' Characteristics..... 34
Table 10. Workers Split by Location..... 35
Table 11. Heterogeneous Impact of Export Expansion to the PRC on Formality and Earnings Growth: 2SLS Estimation by Districts' Endowment 38
Table 12. Annual Percentage of Migrants for Inter-Kecamatan Within a Kabupaten (Sub), Inter-Kabupaten Within a Province (Dist), and Inter-Province (Prov) by Survey Period 41
Table 13. The Impact of Export Expansion to the PRC on Formal Employment and Earnings Growth: 2SLS vs. Plausibly Exogenous Model 45

LIST OF TABLES

Table A1. Sectoral Classification of Tradable Employment (Two-Digit ISIC) 52
Table A2. Descriptive Statistics for the Data Estimation (Standardized) 53
Table A3. The Impact of Export Expansion to the PRC on Formal Employment and Earnings Growth: OLS and 2SLS Comparison—Full Results 54
Table A4. The Impact of Export Expansion to the PRC on Formal Employment: 2SLS Estimation—Full Results 56
Table A5. The Impact of Export Expansion to the PRC on Earnings Growth: 2SLS Estimation—Full Results 58
Table A6. The Impact of Export Expansion to the PRC on Formal Employment by Decile of Earnings: 2SLS Estimation—Full Results 60
Table A7. The Impact of Export Expansion to the PRC on Earnings Growth by Decile of Earnings: 2SLS Estimation—Full Result 63
Table A8. The Heterogeneous Impact of Export Expansion to the PRC on Formal Employment: 2SLS Estimation—Full Results 66
Table A9. The Heterogeneous Impact of Export Expansion to the PRC on Earnings Growth: 2SLS Estimation—Full Results 69
Table A10. Impact of Export Expansion to the PRC on Formality and Earnings Growth: 2SLS Estimation—Full Results, Matched Datasets 72
Table A11. The Impact of Export Expansion to the PRC on Formal Employment by Decile of Earnings: 2SLS Estimation—Full Results, Matched Datasets 74
Table A12. The Impact of Export Expansion to the PRC on Earnings Growth by Decile of Earnings: 2SLS Estimation—Full Results, Matched Datasets 74

LIST OF FIGURES

Figure 1. Trade Share with the PRC in 2007 17
Figure 2. Indonesia's Exports to the PRC and the Rest of the World 18
Figure 3. Export Growth to the PRC: Asian and Latin American Countries 19
Figure 4. Export Growth to the PRC and Other Leading Trading Partners, 2001–2007 19
Figure 5. The Structure of Indonesia's Exports to the PRC by SITC Commodity Group 20
Figure 6. The Pattern of Export Expansion to the PRC Between 2000 and 2007 by Region and ISIC Heading 21
Figure 7. The Impact of Export Expansion to the PRC by Employment Status in the Year 2000 34
Figure 8. The Impact of Export Expansion to the PRC by Earnings Decile in the Year 2000 35
Figure 9. Transitional Patterns Among Workers with Different Earnings Levelst 35
Figure 10. Heterogeneous Impact of Export Expansion on Formal Employment 37
Figure 11. Heterogeneous Impact of Export Expansion on Formal Employment 38
Figure 12. Formality Split by Sectors 41
Figure 13. The Impact of Export Expansion on Formality and Earnings Growth: 2SLS Estimation—Matched Datasets 45
Figure 14. The Impact of Export Expansion to the PRC by Earnings Decile in the Year 2000: Matched Datasets 46
Figure 15. Sensitivity Analysis 48
Figure 16. Heterogeneity Analysis: Sample Excludes Missing Data 48
Figure A1. Balance of Covariates: Overall 82
Figure A2. Balance of Covariates: By Variables 82

INTRODUCTION

The participation of developing economies in global trade has grown significantly over the past two to three decades. For instance, the share of exports from developing Asian countries[1] surged from approximately 11% in the early 1990s to over 20% by the early 2010s, largely driven by the rise of the People's Republic of China (PRC). Despite this impressive growth, it remains uncertain whether this expansion in trade has translated into improved labor market outcomes for workers.

In light of this, two main pieces of empirical evidence are noteworthy. First, a significant portion of workers in developing economies remains engaged in informal employment. For instance, informal work constitutes around 30% of total employment in Latin American countries, such as Brazil and Colombia (Paz, 2014), and over 50% in Indonesia (Pritadrajati et al., 2021). Informal jobs are generally of lower quality compared to formal ones, often being more precarious and poorly paid due to their exemption from labor market regulations (Maloney, 2004; Paz, 2014; Ulyssea, 2020). Second, despite maintaining open trade policies, inequality has continued to rise in many developing regions (Attanasio et al., 2004; Dao et al., 2019; Elsby et al., 2013; Galiani & Sanguinetti, 2003; Ing, 2009; Karabarbounis & Neiman, 2014; Xu et al., 2018).[2] Motivated by these observations, we revisit the labor market impacts of trade expansion, using the case of Indonesia's export boom. Indonesia provides a compelling case study, as it experienced a significant surge in commodity exports driven by the rise of the PRC in the early 2000s. However, there is debate over whether this commodity export boom has led to improvements in labor market outcomes, with some studies arguing that it has not translated into better labor market performance (Coxhead & Shrestha, 2016; Shrestha & Coxhead, 2020).

In this paper, we investigate whether increased exposure to export expansion improves labor market outcomes for individuals over time. Unlike previous studies that primarily examined poverty and employment (Autor et al., 2013; Kis-Katos & Sparrow, 2015; McCaig, 2011; Topalova, 2010), our focus is on whether export expansion in Indonesia enhances the availability of quality jobs, particularly formal employment opportunities. Although Indonesia's export expansion has predominantly been driven by commodities and natural resources, we extend our analysis to include all sectors, such as manufacturing. This broader perspective sets our study apart from existing research on Indonesia's export boom, which has generally concentrated on the impacts of commodity exports (Coxhead & Shrestha, 2016; Edwards, 2019).

We evaluate two primary labor market outcomes. The first is cumulative formal employment, measuring the total years spent in formal jobs from 2000 to 2014. The second is cumulative earnings growth, calculated as the difference in the logarithm of earnings (log earnings) between 2000 and 2014. The first indicator assesses the stability and transitions of workers into formal employment, while the second gauges improvements in earnings over the period. Additionally, we examine the impact of export expansion on income inequality by analyzing how it affects workers at different earnings levels. Although this approach provides only indirect evidence of the relationship

[1] Developing Asian countries include all ASEAN member states, the PRC, India, Pakistan, Bangladesh, and Sri Lanka. The share is computed based on UN Comtrade data downloaded from the World integrated Trade Solutions (WITS) database.
[2] This includes the falling labor share of income, rising wage and income inequality, and the increasing skills premium.

between exports and inequality, detailed distributional insights can offer valuable information for policymakers considering targeted redistributive measures. The outcomes of interest are derived from a balanced panel of adult individuals (aged 25 to 55) consistently covered in all three waves of the Indonesia Family Life Survey (IFLS) conducted in 2000, 2007, and 2014.

To establish a causal relationship, we focus on Indonesia's export expansion driven by the rise of the PRC in the global economy. Specifically, our treatment variable measures the change in Indonesia's exports to the PRC from 2000 to 2007,[3] exploiting the variation in sectoral employment across districts.[4] The PRC's accession to the World Trade Organization (WTO) in 2001 created both a significant export supply shock and a substantial import demand shock due to the positive income effect. This allows us to isolate the exogenous variation in Indonesia's exports to the PRC resulting from the PRC's import demand shock. By using this approach, we control for domestic economic development factors that could also influence export capability. To strengthen our analysis, we use the exports of selected The Association of Southeast Asian Nations (ASEAN) countries to the PRC as an instrument.[5] The underlying rationale is that if the PRC's demand shock has a substantial effect, this would lead to increased exports from various countries, including Indonesia. Importantly, the increase in exports from other economies to the PRC is not directly related to Indonesia's labor market performance, supporting our exclusion restriction assumption.

Comparing labor market performance across districts with varying levels of exposure to export expansion, we find a causal link between export expansion and improved job quality. Specifically, individuals in districts more exposed to export expansion to the PRC exhibit a higher likelihood of being employed in formal jobs in cumulative terms from 2000 to 2014. This effect is significant for workers regardless of their initial employment status in 2000, whether formal or informal. In other words, greater exposure to export expansion enhances the chances of workers remaining in formal employment and facilitates transitions from informal to formal jobs.

While workers in more exposed districts experience greater earnings growth, the effect is not statistically significant. These findings indicate that although export expansion to the PRC may not substantially increase earnings, it plays a notable role in reducing job precarity by promoting formal employment.

We also find that the impact of export expansion has been relatively progressive. Exposure to export expansion raises more formal employment opportunities and earnings growth for individuals in the lower- to middle-income classes, particularly those in the 3rd to 7th deciles of earnings in the pre-shock year of 2000. Conversely, there appears to be no effect for the lowest (1st decile) and highest (10th decile) income groups. This pattern aligns with transitional employment trends observed among individuals in the IFLS, where movement from informal to formal jobs is more prevalent among lower- and middle-income workers (Oktiyanto, 2024). Further heterogeneity analysis reveals additional insights. First, the cumulative impact of exports on formal employment is more pronounced for workers who started with high levels of informality in 2000. Given their initially larger share of informal work, these workers had more opportunities to transition to formal employment as the export expansion progressed. Second,

[3] To improve accuracy, we use mirrored export data, specifically the PRC's imports from Indonesia and other partners.
[4] We use Indonesia's Labor Force Survey (Sakernas) data to determine the sectoral employment variation for each district.
[5] We show later that our instrument, namely ASEAN exports to the PRC, is highly relevant for predicting the structure of Indonesia's export evolution in relation to the PRC.

while the impact on formal employment illustrates the transition story, the heterogeneous effect on earnings growth reflects a Stolper–Samuelson-like effect at a local level: As the island of Java experienced greater exposure to export expansion, the impact on returns was more significant for factors relatively abundant in that region.

These effects are not attributable to selection bias across individuals and districts. The overall impact and progressivity remain consistent even when using matching techniques to compare individuals with similar observable characteristics in the pre-shock period. Moreover, after controlling for initial district growth in tradable and formal employment from 1997 to 2000, the effect of export expansion persists, suggesting that the results are not merely a continuation of preexisting development trends. However, these findings do not imply an aggregate impact of export expansion on inequality. Instead, they highlight the relative effects across individuals in districts with different levels of exposure to export expansion. Consequently, they do not account for the high levels of informality and inequality in Indonesia during the commodity boom of the early 2000s (Coxhead & Shrestha, 2016; Shrestha & Coxhead, 2018). A notable caveat of this study is that it assumes fixed individual residences in the pre-shock period (2000), which avoids issues the sorting problem related to people moving to more favorable regions following the export expansion but does not account for internal migration. Despite this, the conclusions are likely valid given the minimal role of internal migration in our data (Pardede et al., 2020).

This study contributes to two strands of literature. First, it addresses the PRC's rise from a demand-side perspective. While much research has focused on the adverse labor market impacts of the PRC's supply-side effects, especially in developed countries (Acemoglu et al., 2016; Autor et al., 2013; Autor et al., 2014), less attention has been paid to how the PRC's demand shock has affected its trading partners (Feenstra et al., 2019). Unlike the negative impacts observed from PRC imports, which typically reduce good jobs and earnings in the manufacturing sector, our findings suggest that export expansion to the PRC improves formal job opportunities and earnings, particularly benefiting the lower- and middle-income classes.

Second, this paper enriches the literature on the effects of export booms in commodity-dependent nations. While manufacturing exports are known to promote formality and reduce poverty (McCaig, 2011; McCaig & Pavcnik, 2018), the impact of commodity-driven export expansion remains debated. For instance, Costa et al. (2016) found wage growth in Brazil's regions exposed to rising commodity demand from the PRC without a worsening of inequality, whereas Coxhead and Shrestha (2016) reported increased informality and inequality during Indonesia's palm oil boom, also driven by the PRC. Our study, focusing on Indonesia's broader export expansion to the PRC, finds rising formal job opportunities and earnings growth despite the continued dominance of commodity exports. This discrepancy may be attributed to our inclusion of manufacturing export expansion, which positively affects labor market performance compared to commodities alone. Our results show that the benefits of export expansion are concentrated in districts with significant manufacturing activity, whereas the impacts on districts reliant on agriculture and commodities are not statistically significant, albeit larger in magnitude.[6] This underscores the importance of manufacturing exports in enhancing labor market outcomes in a commodity-dependent country such as Indonesia.

[6] We later show that the large but insignificant coefficient for the commodity-reliant group is inflated by the weak-instrument problem.

The remainder of this paper is organized as follows: The next section reviews relevant literature, Section 3 discusses the significance of the PRC's rise as a source of export expansion for Indonesia and other developing countries, Section 4 details the methodology, and Section 5 describes the data used. Section 6 presents and discusses the empirical results, and Section 7 concludes the paper, outlining its implications and potential areas for future research.

LITERATURE REVIEW

The standard prediction from trade theory is that workers in labor-abundant developing countries will benefit relatively more as these countries engage in international trade (Krugman et al., 2018). According to this theory, trade openness will lead to specialization in unskilled labor-intensive industries, thereby increasing the demand for unskilled labor compared to other factors such as skilled labor and capital. Since unskilled labor makes up a significant portion of the workforce in developing economies, improvements in employment and earnings for these workers can help reduce inequality. Factors of production will shift away from import-competing sectors toward export-oriented industries, which benefit from increased relative prices due to global trade.

While this standard prediction seems intuitive, recent empirical evidence suggests that the effects are more nuanced. Even among workers who are theoretically positioned to benefit from globalization, there are clear winners and losers (Pavcnik, 2017). The impact of trade on the labor market depends significantly on the types of shocks workers face and their initial characteristics.

In terms of trade shocks, workers experience different impacts depending on whether they are exposed to exports or imports. Studies have shown that individuals living in regions or working in industries exposed to greater import competition face adverse labor market outcomes (Dix-Carneiro & Kovak, 2019; Topalova, 2010), while those in areas with more exposure to exports generally fare better (Erten & Leight, 2021; McCaig, 2011; McCaig & Pavcnik, 2018). Similar to the disemployment effects observed in advanced economies such as the United States (US), where import competition from the PRC has negatively impacted local earnings and employment (Acemoglu et al., 2016; Autor et al., 2013), studies in developing economies have linked exposure to import competition with reduced earnings and employment. However, a notable feature of developing economies is that displaced workers often transition to informal jobs. While informal employment is less desirable compared to formal jobs, it provides a better alternative to unemployment (Dix-Carneiro & Kovak, 2019). Thus, in developing economies, informal employment can serve as a buffer amid heightened trade competition.

Conversely, exposure to increased exports tends to improve earnings and employment, including in formal sectors. The expansion of exports raises labor demand in the local economy and industry, resulting in positive labor market effects. Nonetheless, there is ongoing debate about whether commodity exports produce similarly positive labor market outcomes. Some studies have argued that commodity export booms exacerbate inequality, as earnings may stagnate and formal employment may be negatively affected (Coxhead & Shrestha, 2016; Shrestha & Coxhead, 2018; Wihardja, 2016). This perspective suggests that the surge in commodity exports diminishes the competitiveness of manufacturing exports, leading to a decline in formal employment and an increase in informal sectors. By contrast, Costa et al. (2016) found that regions in Brazil exposed to rising commodity demand from the PRC experienced larger wage growth without a worsening of inequality. This indicates that the labor market and distributional impacts of trade in developing economies remain an empirical puzzle. This paper adds to the discussion by examining labor market outcomes in a major developing economy that benefits from the PRC's commodity export boom, while also including an assessment of all tradable sectors, including manufacturing.

Although standard trade theory suggests that less-skilled workers in unskilled-labor-abundant countries would benefit more from trade, this assumption relies on fully mobile factors. When unskilled workers can shift from disadvantaged (import) to advantaged (export) sectors, they should theoretically receive greater returns due to expansion in the export sector. However, real-world labor markets are not frictionless. More educated and skilled workers may benefit more from export expansion than unskilled ones, as they are better positioned to seize and adapt to exporting opportunities. This is often because export expansion requires new technology, which necessitates a more skilled workforce (Bustos, 2011). Consequently, skills-biased export expansion could exacerbate inequality. This paper contributes to the debate on inequality by evaluating whether export expansion disproportionately affects workers based on their earnings, education levels, and other demographic characteristics (e.g., gender and residence).

CONTEXT: HOW THE RISE OF THE PRC HAS SHAPED THE EXPORTS OF INDONESIA AND OTHER DEVELOPING COUNTRIES

The rise of the PRC has been pivotal in understanding the impact of trade on labor markets. This is largely because the PRC's emergence on the global stage, particularly following its accession to the WTO in 2001, led to a significant and abrupt trade shock for its trading partners. This unexpected shift provided researchers with a valuable exogenous shock to analyze, as it was not anticipated by the domestic markets (Autor, 2018; Autor et al., 2016).

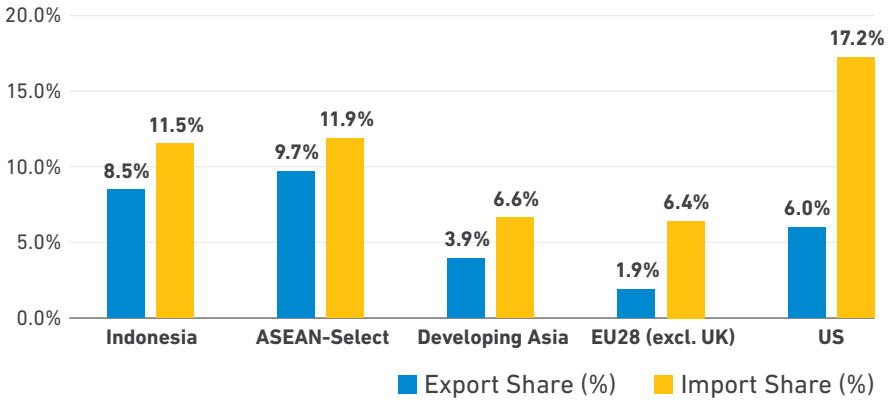
However, much of the research has focused on the impact of the PRC's rise in the context of its imports into developed countries, especially the US. This focus is partly due to the fact that developed nations engage with the PRC predominantly as importers. By contrast, the PRC's role in the trade baskets of developing economies is more balanced. For example, by 2007, a few years after the PRC's WTO accession, the PRC's share of US and European Union (EU) imports was approximately three times larger than its share of US and EU exports. However, the gap between the export and import share with the PRC is much narrower for Indonesia and several other ASEAN and developing Asian countries (see Figure 1).[7] This suggests that examining the PRC's rise as an export destination offers a more relevant context for studying its impact on developing economies, though this does not negate the effects of exports to the PRC observed in developed countries (e.g., Feenstra et al., 2019).

The PRC emerged as a major global buyer following its accession to the WTO in 2001 (see Table 1). Table 1 highlights the dramatic and sudden increase in the PRC's role as a major global importer, which was particularly evident during the early 2000s. Prior to joining the WTO, the PRC accounted for only about 3% of global import demand, with import growth typically around 10% annually. However, after its accession, the growth of PRC imports surged to nearly 25% per year, significantly outpacing the pre-accession growth rate. This rapid expansion increased the PRC's share of global imports to 6% by 2007.

The rise in the PRC's import demand subsequently spurred export expansion among its trading partners, with Indonesia being a notable beneficiary. Prior to the PRC's WTO accession, Indonesia's exports to the PRC and the rest of the world followed a somewhat parallel trend (see Figure 2). Specifically, from 1992 to 1998, Indonesia's exports to the PRC grew at a modest rate of 5% annually. However, following the PRC's accession, this growth rate surged dramatically to over 28% annually between 2001 and 2007 (see Figure 3). Consequently, the trend in exports to the PRC diverged significantly from exports to other countries (see Figure 2), and the share of exports to the PRC in Indonesia's total export basket increased from 6% in 2001 to nearly 12% by 2007. This rapid growth, however, began to moderate following the global financial crisis of 2008–2009.

[7] Developing Asian countries include all ASEAN member states, India, Pakistan, Bangladesh, and Sri Lanka. The share is computed based on UN Comtrade data downloaded from the WITS database.

Figure 1.
Trade Share with the PRC in 2007



Note: The selected ASEAN countries include Brunei Darussalam, Malaysia, Myanmar, the Philippines, Singapore, and Thailand, while the developing Asian countries cover all ASEAN member countries plus India, Pakistan, Bangladesh, and Sri Lanka.

Source: Authors' calculation based on UN Comtrade data downloaded from the WITS database.

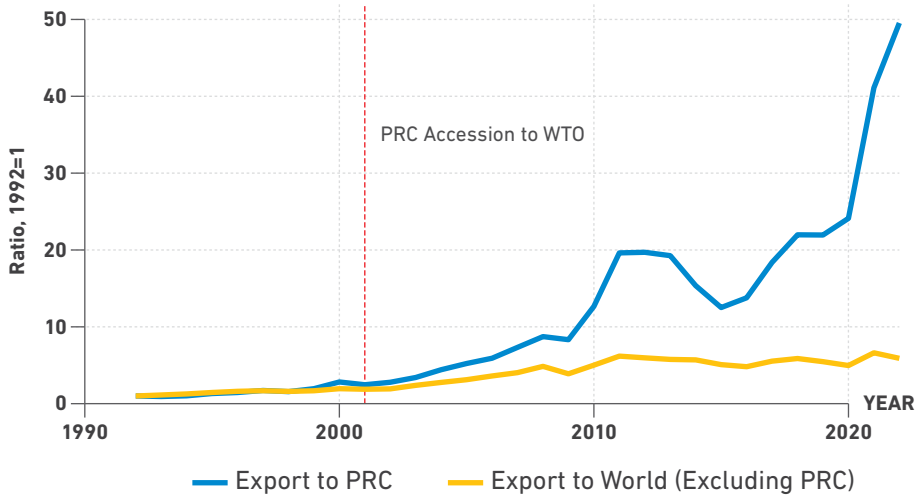
Table 1.
The Rise of the PRC: An Import Demand Perspective[8]

Year	PRC's Total Imports (Billion USD)	World's Total Imports (Billion USD)	PRC's Share of World Imports	PRC's Import Growth (Annualized)	
1992	80.6	2,470.5	3.3%	Average 1992–1998:	10.1%
1998	140.2	5,345.1	2.6%		
2001	234.8	6,201.7	3.8%	Average 2001–2007:	24.7%
2007	870.3	13,944.0	6.2%		
2009	919.1	12,399.4	7.4%	Average 2009–2015:	10.4%
2015	1,536.2	16,070.2	9.6%		

Source: Authors' estimation based on UN Comtrade data downloaded from the WITS database.

[8] We compare the periods 1992–1998, 2001–2007, and 2009–2015 to avoid contamination from economic crises. While looking at more recent data can be useful, the sole idea of this section is to highlight the transitory nature of the export boom with the PRC. Therefore, covering periods of the same length before and after the PRC's accession to the WTO is sufficient for this purpose. Furthermore, this paper is interested in the impact of the export expansion to the PRC that happened in the past rather than in recent times.

Figure 2.
Indonesia's Exports to the PRC and the Rest of the World



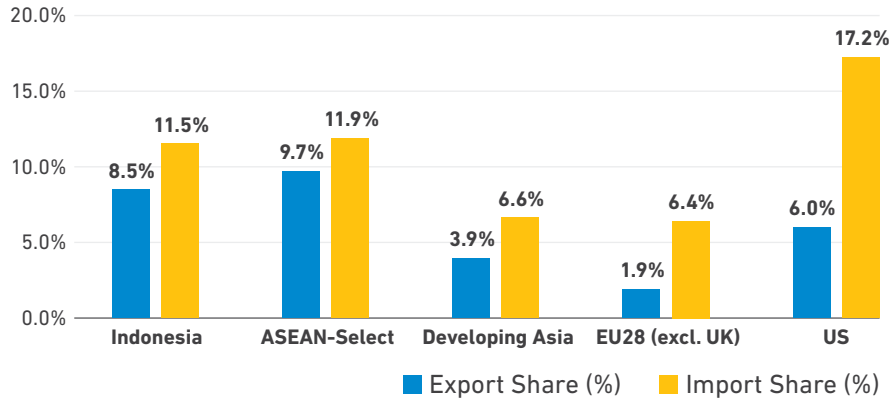
Source: Authors' estimation based on UN Comtrade data downloaded from the WITS database.

The export expansion episode was also observed in many other developing economies across Asia and Latin America (see Figure 3). The pattern is consistent: Exports to the PRC spiked shortly after its accession to the WTO, particularly between 2001 and 2007, before moderating afterward, with exceptions such as Argentina and Viet Nam.[9] This widespread trend suggests that the export growth experienced by Indonesia was likely driven by an import demand shock in the PRC rather than by specific domestic factors. If domestic factors were more influential, the increase in exports would not have been as uniform across different countries. This supports the use of export data from other countries to the PRC as an instrument for our treatment variable.

Notably, the rapid export growth between 2001 and 2007 was largely confined to the PRC. During this period, for many developing Asian and Latin American countries, the increase in exports to the PRC far outpaced exports to other major trading partners, such as Japan, the US, Canada, the EU, and the UK (see Figure 4). In some cases, the export growth rate to the PRC was even twice as high as that to other major markets. Specifically for Indonesia, exports to Japan grew by only around 10% from 2001 to 2007, while exports to the PRC expanded nearly three times faster. This reinforces our argument that the surge in exports to the PRC from developing countries, including Indonesia, during the 2000s was primarily driven by the demand shock originating in the PRC.

[9] For Argentina, the export growth to the PRC in the early 2000s was pretty much comparable to that of the 1990s, while for Viet Nam, exports to the PRC started to pick up only very recently. This is partly due to the rise of Viet Nam in the global economy, which occurred rather late. The rise of Viet Nam's exports in the global market, however, was mainly driven by its exports to more advanced nations, such as the US, Canada, and European countries, rather than to the PRC (see Figure 4).

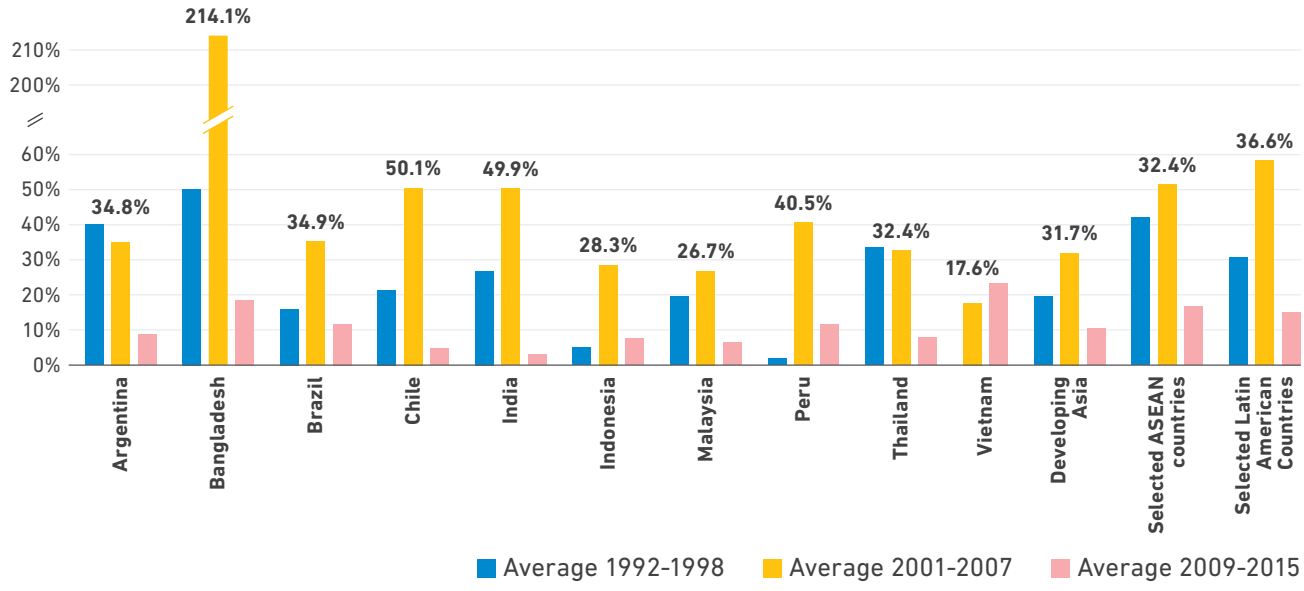
Figure 3.
Export Growth to the PRC: Asian and Latin American Countries



Note: The selected ASEAN countries include Brunei Darussalam, Malaysia, Myanmar, the Philippines, Singapore, and Thailand, while the developing Asian countries cover all ASEAN member countries plus India, Pakistan, Bangladesh, and Sri Lanka. The selected Latin American countries consist of Argentina, Brazil, Chile, Mexico, Peru, Paraguay, Uruguay, and Venezuela.

Source: Authors' calculation based on UN Comtrade data downloaded from the WITS database.

Figure 4.
Export Growth to the PRC and Other Leading Trading Partners, 2001–2007



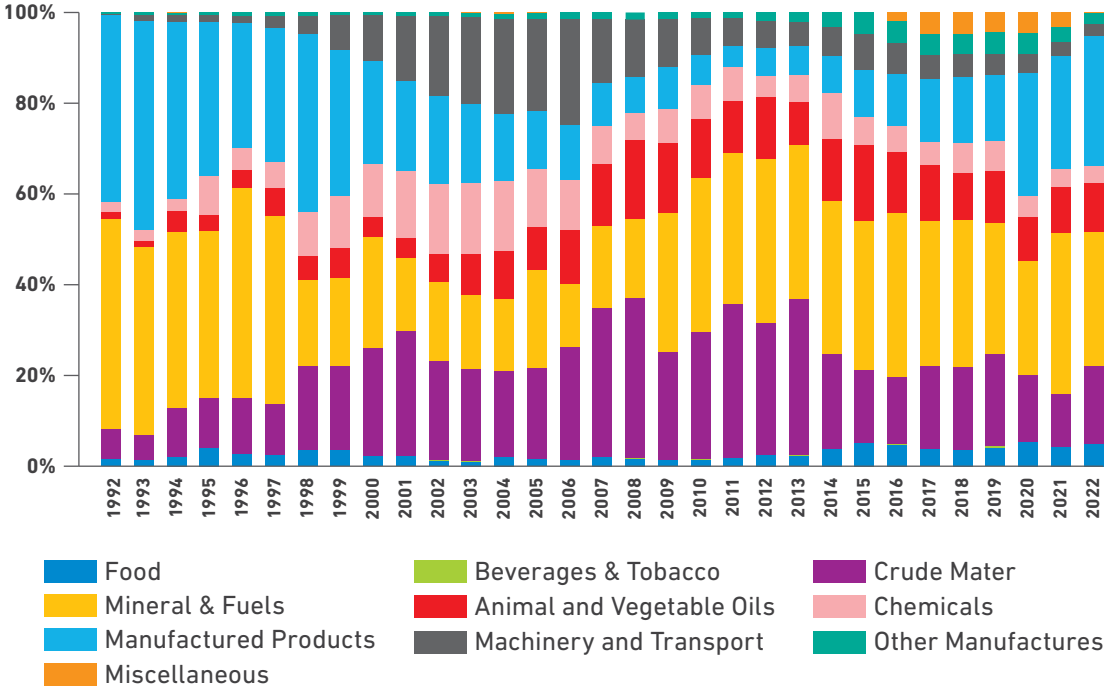
Note: The selected ASEAN countries include Brunei Darussalam, Malaysia, Myanmar, the Philippines, Singapore, and Thailand, while the developing Asian countries cover all ASEAN member countries plus India, Pakistan, Bangladesh, and Sri Lanka. The selected Latin American countries consist of Argentina, Brazil, Chile, Mexico, Peru, Paraguay, Uruguay, and Venezuela.

Source: Authors' calculation based on UN Comtrade data downloaded from the WITS database.

Although exports to the PRC grew rapidly across various countries, the structure of this export expansion differed, reflecting each country's comparative advantages. For Indonesia, the expansion was predominantly driven by raw materials, mining, and commodity products (see Figure 5). Key exports to the PRC between 2001 and 2007 included nonferrous metal ore (ISIC 2302), palm oil (ISIC 3115), and coal (ISIC 2100), which together accounted for over half of Indonesia's export growth to the PRC during this period. Despite this dominance, there was a notable increase in manufacturing exports, which, while still less significant than resource-based exports, accounted for around 20% of the growth in exports to the PRC. This included a range of machinery and equipment products, from communication equipment to general office and computing machines (see the brown bar in Figure 5 and the blue bar in Figure 6). Therefore, to fully understand the impact of trade on the labor market, it is essential to consider all tradable goods, not just commodities. This holds true even for a commodity-dependent nation like Indonesia, particularly given the nonnegligible expansion of its manufacturing exports to the PRC.

By contrast, other ASEAN countries saw their export growth to the PRC heavily concentrated in manufacturing, particularly machinery and equipment products, which contributed to over 70% of their increased exports. This pattern reflects the comparative advantages of countries such as Malaysia, Thailand, and the Philippines in the machinery and electronics sectors. Latin American countries, however, exhibited a pattern similar to Indonesia's, with their export expansion predominantly driven by resource-based products, though with a smaller role for manufacturing exports compared to Indonesia. This variation in export structures ensures that while our instrument does not perfectly correlate with the treatment variable, it remains a robust predictor of export expansion trends.

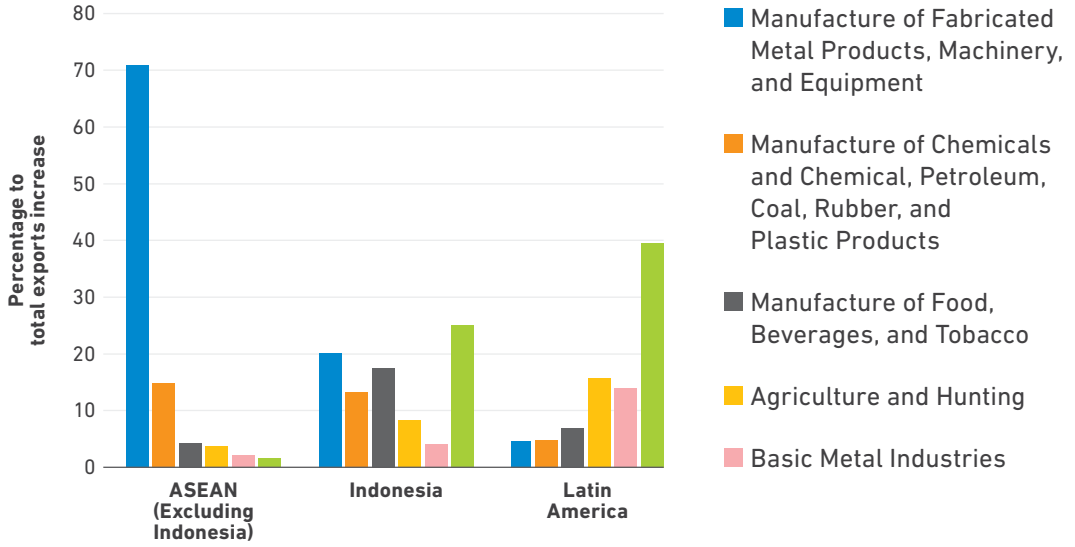
Figure 5.
The Structure of Indonesia's Exports to the PRC by SITC Commodity Group



Note: The product classification is based on SITC Revision 3 at the one digit level of commodity group.

Source: Authors' calculation based on UN Comtrade data downloaded from the WITS database.

Figure 6.
The Pattern of Export Expansion to the PRC Between 2000 and 2007 by Region and ISIC Heading



Note: The figure includes only the top six export sectors and is sorted based on ASEAN's exports. The product classification is based on ISIC Revision 2 at the heading level (two digits). The selected ASEAN countries include Brunei Darussalam, Malaysia, Myanmar, the Philippines, Singapore, and Thailand, while the Latin American group consists of Argentina, Brazil, Chile, Mexico, Peru, Paraguay, Uruguay, and Venezuela.

Source: Authors' calculation based on UN Comtrade data downloaded from the WITS database.

METHODOLOGY

We compare labor market outcomes between individuals residing in districts more exposed to export expansion to the PRC and those in less exposed districts. Our baseline model is specified as follows:

$$y_{irc} = \beta_0 + \beta_1 REE_r + X'_{i,0}\beta_2 + Z'_{r,0}\beta_3 + \alpha_p + \epsilon_i \quad (1)$$

In this model, *i* denotes the individual, while *r* and *p* refer to the district and province of residence, respectively. We use data from the pre-accession year of 2000 to hold these residential variables constant.[10] We keep individuals' residence fixed for two key reasons. First, our objective is to assess whether residing in districts with greater exposure to export expansion affects labor market performance in cumulative terms over time. Individuals' residential choices in 2000 would not have anticipated the trade shock resulting from the PRC's WTO accession in 2001. The sudden nature of this shock means that jobseekers and workers could not have predicted which districts would benefit more. This approach allows us to isolate the impact of residing in more trade-exposed districts while controlling for other preexisting individual and district characteristics. Second, while this assumption of no significant internal migration helps mitigate the self-selection bias—where workers might move to more advantageous regions with higher export exposure—it also minimizes the risk of confounding results. If individuals were able to relocate to districts benefiting from export expansion, any observed improvement in labor market outcomes could be misattributed to migration rather than the actual trade shock. This method aligns with previous work (e.g., Autor et al., 2014) that highlights how selection problems can complicate inferences about the impact of trade shocks. Thus, our methodology aims to reduce this selection problem and better capture the true effect of export exposure on labor market outcomes.

Subscript c indicates that our outcome variable y is constructed in cumulative terms covering the period from 2000 to 2014. Meanwhile, subscript $_0$ captures the year(s) preceding the PRC's shock period. $X_{i,0}$ is a vector of individual-level controls in the pre-accession year of 2000, which includes gender, age, father's educational background, and the sanitary conditions surrounding one's livelihood. $Z'_{r,0}$ is our district-level control in the baseline year of 2000, which includes tradable employment growth from 1997 to 2000. This district-level control is chosen to minimize the risk that variations in individuals' earnings growth and formal employment stem from preexisting regional labor market trends prior to the PRC's accession to the WTO. Finally, α_p represents the time-invariant provincial fixed effects (FE). Hence, this model essentially compares the labor market performance of individuals living in different exposure sites, conditional upon individual- and district-level initial characteristics as well as province fixed effects.

Our cumulative labor market outcomes (y_{irc}) consist of two indicators. The first is the years spent in formal employment $\left(L^f_{irc}\right)$. This is constructed by counting the number of years during

[10] It is important to note that our sample covers adults during their most productive age of 25 to 55. This means our sample mostly consists of employed individuals (workers), as these are at their most productive age. Therefore, we often refer to them as "workers" rather than "individuals," especially when analyzing earnings growth.

which an individual held formal employment from 2000 to 2014, as expressed by the following formula: $L^f_{irc} = \sum_{t=2000}^{2014} L^f_{irt}$, where $L^f_{irt} = 1$ if a person held a formal job and $L^f_{irt} = 0$ if a person worked in informal employment. The formality of employment is defined solely based on employment status, according to which formal workers are government employees, private employees, or self-employed with permanent workers.[11] The second outcome is cumulative earnings growth, calculated by taking the long difference in log earnings between 2014 and 2000. Specifically, this is computed as follows: $TEG_{irc} = \sum_w (\ln E_w - \ln E_{w-7})$, where $w \in \{2007, 2014\}$ corresponds to the IFLS survey waves. We define earnings as the total income of an individual derived from various sources. This includes not only salary from working but also income from other business ventures.

REE_r is our main treatment variable and measures regional exposure to export expansion at the district level. β_1, therefore, quantifies the relative impact of living in the more exposed districts on labor market performance. The idea is that while export expansion to the PRC only varies across industries and time at the national level, districts experience different exposures due to varying industry specializations, as measured by the employment structure before the shock period. This makes it possible to establish a distinct exposure measure at the district level. Specifically, we define our treatment variable as the exposure to the change in exports to the PRC per worker in a particular district *r*:

$$REE_r = \sum_j \frac{L_{rj,0}}{L_{r,0}} \frac{\Delta EE^{ID,C}_{jt}}{L_{j,0}} \tag{2}$$

Our REE_r, hence, is essentially a *shift-share* variable, which takes a few steps to construct. We first normalize the *shift* component, that is, the national-level change in Indonesia's exports to the PRC from 2000 to 2007 $\left(\Delta EE^{ID,C}_{jt}\right)$, using the number of workers in the particular sector *j*. We limit our attention to the shock during the early 2000s, as these were the years in which the PRC's imports increased the most, before the global financial crisis hit in 2008–2009 (see Table 1).

Then, we link the normalized export expansion to the PRC $\left(\Delta EE^{ID,C}_{jt} / L_{j,0}\right)$ to each district based on the sectoral employment *share* of the local economy. Both the national-level sectoral employment level $\left(L_{j,0}\right)$ and the district-level sectoral employment share $\left(L_{rj,0}/L_{r,0}\right)$ are constructed using pre-accession labor market survey (Sakernas) data from 2000. The detailed product-level trade data are collapsed to the most disaggregated sectoral classification allowed by the Sakernas dataset, which is the two-digit ISIC based on Revision 2. The use of pre-accession labor market data enables us to isolate the impact of the trade shock $\left(\Delta EE^{ID,C}_{jt}\right)$ and minimizes concern that

[11] This definition is in line with the definition used by the Indonesia Statistics Agency (BPS), which refers to the definition of the International Conference of Labour Statisticians (ICLS-13) held by the International Labour Organization (ILO). We use this definition for the entire survey period to maintain consistency. The latest definition of the formality of employment is based on ICLS-17, which, in addition to viewing employment status, also looks at economic units, contributions to social security, entitlement to and benefits of paid annual leave, and entitlement to and benefits of paid sick leave. Some of that information is not available in the old survey period of the IFLS.

the effect is driven by changing sectoral specialization at the district level stimulated by the rise of the PRC. We focus only on tradable employment when constructing the districts' sectoral employment share, as this is more closely related to the trade dataset and is more representative of the actual trade exposure felt by workers at the district level (see Table A1 for a list of all tradable sectors used in this paper).

However, the main identification challenge is that the growth of Indonesia's exports to the PRC likely coincides with Indonesia's economic development progress, which raises production and exporting capabilities across the board. Without any modification, we cannot distinguish whether the impact on labor market outcomes is due to export expansion or Indonesia's own developmental progress.

To address this, we take advantage of the fact that following its accession to the WTO in 2001, not only did the PRC's exports increase, but its domestic demand also rose following a positive income effect. The rise of the PRC as a major global importer was substantial and sudden, occurring in a short space of time (see Table 1). The PRC's share of the world's import demand doubled in less than a decade. This means we can isolate the exogenous variation of Indonesia's exports to the PRC that emanates from the foreign demand shock component. This strategy allows us to remove the labor market effect stemming from domestic factors. In light of this, we use selected developing ASEAN countries' exports to the PRC as an instrument for circumventing the endogeneity problem in our treatment variable. The ASEAN countries include Brunei Darussalam, Malaysia, Myanmar, the Philippines, Singapore, and Thailand. The main reason behind this selection is that they were all among the founding members of the WTO in 1995. By focusing on the founding members, we ensure that the changes in exports among our instrumental variable (IV) countries were not driven by the export supply shock associated with late accession into the WTO in the 2000s. The rise in the exports of Viet Nam in the 2010s is a case in point (see Figures 3 and 4). Meanwhile, for the founding members, any export supply shock associated with membership of the WTO would have started in the second half of the 1990s and likely dissipated in the period of our analysis, which covers the 2000s and early 2010s. Thus, by limiting the IV to include only the founding members of the WTO in the ASEAN region, we can focus on the impact of the import demand shock in the PRC that started in the early 2000s, minimizing the contamination from other shocks.

Our instrumental variable is constructed through the following formula:

$$REE_r^{OTH} = \sum_j \frac{L_{rj,1997}}{L_{r,1997}} \frac{\Delta EE_{jt}^{OTH,C}}{L_{j,1997}} \tag{3}$$

Here, $\Delta EE_{jt}^{OTH,C}$ represents the export expansion of selected ASEAN countries to the PRC in the same period of 2000 to 2007. However, for the instrument, we use the 1997 Sakernas dataset for the employment structure, rather than the 2000 dataset. The three-year lag is employed to mitigate any simultaneity bias between the main treatment variable and the IV, as Autor et al. (2014) suggested. This approach also helps prevent our IV from directly influencing outcomes due to anticipatory effects of employment structure near the timing of the PRC's accession to the WTO.

The intuition is that the demand shock in the PRC will stimulate increased exports from various countries, including Indonesia. This is precisely the reverse of the PRC's export supply shock, as discussed in Autor et al. (2013), which simultaneously affected imports into the US and other high-income economies. In addition, the increase in exports from selected ASEAN countries to the PRC will not directly influence Indonesia's labor market performance, hence giving support to our exclusion restriction assumption.

The immediate threat to our IV design is that export expansion could be driven by the common export supply shock across developing economies. Perhaps a positive technological shock coincided with the PRC's rise and consequently helped countries expand their exports to all trading partners. Such a correlated supply shock would threaten the validity of our design, as our instrument might not be exogenously determined. Based on the analysis in Section 3, we argue that the possibility of a correlated supply shock does not pose a serious issue in our model. If these correlated shocks were important, we would have seen rapid export growth to other major trading partners rather than only to the PRC. Instead, we found a rapid export expansion, especially in the early 2000s, that was uniquely applied to the PRC. The growth of exports to other major trading partners, such as Japan, the US, Canada, the EU, and the UK, simply fell short of that to the PRC (see Figure 4). Therefore, although it cannot be entirely ruled out, this minimizes concerns that the export expansion was driven by a correlated export shock among countries.

The other threat relates to the selection bias problem. The difference in labor market performance across individuals living in different exposure sites might be driven by individuals' initial characteristics and preexisting trends in districts that had varied even before the rise of the PRC. To minimize the concern of selection bias due to individual characteristics, as a robustness check, we only compare similar individuals based on their observable characteristics obtained through matching techniques. We sort individuals based on exposure to export expansion and put those living in districts with REE_r above the 75th percentile in a treated group and the rest in a control group. The workers in the treated and control groups are then matched using one-to-one nearest neighbor propensity score matching (PSM) based on individual-level covariates $\left(X_{ir,0}\right)$ as well as formal job status, yearly earnings, and education level in the base year of 2000. We then run Equation (1) for the matched samples and compare it with the main results. To account for preexisting district trends, we already control for districts' labor market evolution from 1997 to 2000, which mainly includes growth in tradable employment. For completeness, we also experiment with controlling for growth in formal employment in our robustness analysis.

DATA

This paper combines three datasets. The first is the Indonesia Family Life Survey (IFLS) dataset, which is our primary data source for individual labor market outcomes and characteristics. The IFLS is a longitudinal household survey that contains key information on Indonesian individuals and households, including their consumption, income, assets, education, migration, labor market outcomes, and other demographic variables. The first wave of the survey, IFLS1, was conducted in 1993–1994 and covered 13 out of 27 provinces in Indonesia, representing about 83% of the population at that time. The next waves then tracked the same sample roughly every seven years, with average recontact rates of around 87.8% for all rounds of the survey period. The latest survey period in 2014 included over 70,000 individuals and around 16,000 households. Table 2 provides brief descriptive statistics of the full IFLS sample.

Table 2.
Full IFLS Sample

Year	Full Sample				
	Observations	Mean Age (Years)	Log (Monthly Real Income in IDR)	Hours Worked (Weekly)	Formal Shares (% of Total Workers)
1993	33,115	27.554	12.930	42.444	39.1%
1997	39,714	37.181	12.961	41.382	44.5%
2000	49,424	36.313	12.925	43.826	45.2%
2007	62,935	37.04	13.169	43.718	38.1%
2014	75,680	38.496	13.408	46.485	42.5%

Source: Authors' calculation based on IFLS datasets.

For this study, we utilize the last three surveys, namely 2000, 2007, and 2014, as the change in export trend is visible after 2000. In particular, we use balanced panel data from the IFLS, with the sample comprising individuals who were consistently present in the 2000, 2007, and 2014 survey waves. In addition, we further limit our sample to respondents at their productive age, between 25 and 55 years old, for the entire survey wave. In this way, we can study the dynamics of the labor market using the same individuals and avoid the possibility of different idiosyncratic characteristics affecting the dynamics of the labor market. We take advantage of the retrospective nature of employment-related questions in the IFLS, which allows us to construct cumulative formal employment $\left(L_{irc}^{f}\right)$ based on annual data from 2000 to 2014 rather than by waves. Retrospective questions are available only for limited items, such as those on the status, type, and location of employment. That is why we are able to construct cumulative outcomes based on annual data for formality but not for earnings growth.

Table 3 outlines the characteristics of the individuals who are the subjects of our analysis. As expected, as all of them are at their productive age, most individuals in our sample are in the labor force and employed. However, formal employment is rare in our dataset, where workers are typically either self-employed, self-employed with unpaid or temporary workers, unpaid

family workers, or freelancers. The earnings split between formal and informal employment can be significant, with those in formal employment able to earn up to 60% more than those holding informal jobs (see Table 4). This means the quality of jobs is still an issue for the majority of workers in Indonesia, at least for those represented in our datasets. This motivates us to look at the impact of exports on formality instead of on employment. Intuitively, as the majority of individuals have been employed, any effect on export expansion will likely be detected through the formality margin rather than the employment one.

Table 3.
Balanced IFLS Panel

Year	Balanced Panel						
	Observations	Mean Age (Years)	Monthly Real Income (Log)	Hours Worked (Weekly)	Not in Labor Force (% of Total Observations)	Employed Share (% of Total Labor Force)	Formal Share (% of Total Employed)
2000	7,017	32.66	13.03	44.15	0.6%	78.7%	47.3%
2007	7,017	39.90	13.28	43.43	1.5%	83.0%	34.6%
2014	7,017	46.75	13.49	46.66	3.8%	84.7%	35.8%

Source: Authors' calculation based on IFLS datasets.

Table 4.
Differences in Workers' Earnings by Type of JOB

Year	Monthly Real Income (Log)		Difference	T-stat	P-value (Two-Tailed)
	Formal	Informal			
2000	13.15	12.88	26.99%	9.08	0.000
2007	13.62	13.01	60.88%	21.33	0.000
2014	13.85	13.21	64.14%	20.61	0.000

Source: Authors' calculation based on IFLS datasets.

The second is a trade dataset obtained from the United Nations (UN) Comtrade database, accessed through the World Integrated Trade Solution (WITS) platform. We make use of mirrored export data, utilizing the PRC's imports from Indonesia and other countries to observe exports into the PRC. The mirrored export data are understood to improve accuracy and be more representative of the actual export value, as reporting economies tend to underreport their export values. The underreporting problem is much less of an issue in import statistics, as countries are compelled to check trade values more thoroughly to enforce trade regulations on goods entering their borders.

We then link these trade data to the district level, using their labor market structure in the pre-accession year of 2000 based on Indonesian Labor Force Survey (Sakernas) data. In addition to Sakernas 2000, we use Sakernas 1997 to construct our IV and district-level control variable. Sakernas, our third dataset in this study, is a cross-sectional household survey specifically designed to collect information on labor force statistics, allowing us to gather the sectoral employment variable. The Sakernas datasets offer detailed sectoral employment information

for each district in Indonesia. While it is acknowledged that Sakernas may not be representative at levels lower than the province (as highlighted by Kis-Katos and Sparrow, 2015), this is unlikely to introduce bias into our econometric model (1), especially as we use districts' labor market structure in the year 2000, which preceded the demand shock in the PRC (Erten et al., 2019). Additionally, our focus is not on estimating total employment per district but on determining the relative importance of a particular sector *j* in a district's labor market. Alternatively, one could use a sampled version of the Indonesian Census, which is available through the Integrated Public Use Microdata Series (IPUMS) system, to construct sectoral weights for each district. However, the main drawback is that the IPUMS dataset only contains a very small sample of census data, resulting in a significant underestimation of national-level sectoral employment $\left(L_{j,0}\right)$ which is central in normalizing exports into the PRC. Another limitation of IPUMS data is that they have much less sectoral variation than Sakernas, especially in the period of interest, where sectors only vary at the one-digit ISIC level. This would result in less data variation or, in other words, export expansion structures that are quite similar across districts.[12]

The Sakernas 2000 dataset encompasses 303 out of the total of 342 districts in Indonesia for the year 2000.[13] Following the imposition of district-level weight based on Sakernas 2000, we find a considerable variation in district-level exposure to export expansion to the PRC. The highest exposure category comprises 59 districts, encompassing Sumatera (22.22%), Java (38.89%), Bali (5.56%), Kalimantan (25.93%), Sulawesi (5.56%), and Maluku (11.11%). Among the top 10 districts with the highest exposures, Kalimantan dominates with six districts. Given that Indonesia mainly exports resource-based products to the PRC, it is reasonable to anticipate that regions in Kalimantan, which relies heavily on the resources sector, will have the highest level of exposure. The other districts in the highest category include districts from Java (two), followed by Sulawesi (one) and Maluku (one). By contrast, districts with the smallest exposure to expansion are predominantly from Java and Sumatera, while some districts are exposed to export contraction. The latter include Sukabumi, Kotawaringin Barat, Kepulauan Sula, and Palu, ranked consecutively from the highest contraction.

The Sakernas-based export exposure variable $\left(REE_r\right)$ is then matched to the IFLS dataset, which varies at the individual level, using residential information. However, as discussed in the previous section, we only match it with residential data as of 2000 and assume it to be fixed over time to avoid a sorting problem, as individuals might move to more favorable districts due to the opportunities presented by export expansion to the PRC. The IFLS dataset covers fewer districts than Sakernas, and due to its more limited sampling coverage, some districts do not find a match. The number of districts reduces to 192, representing only 56.14% of all Indonesian districts in 2000. In this IFLS-matched dataset, the top 10 districts with the highest exposures are now dominated by districts on the island of Java, followed by Kalimantan, Sumatra, Bali, and Sulawesi. Kalimantan no longer dominates the districts with the highest exposures because many of the districts in Kalimantan are not covered by the IFLS dataset.

[12] The difference in terms of periods across the three datasets (trade, Sakernas, and IFLS) is not an issue here, as we aim to see whether individuals living in the more exposed districts in the year 2000 experience better labor market outcomes later on. Cumulative outcomes from IFLS 2000–2014 are used to assess labor market performance following the trade shock. Meanwhile, the trade shock variable is derived from export expansion data between 2000 and 2007, which are mapped to the district level, using Sakernas 2000 to identify sectoral specializations in each district based on employment structure.

[13] Districts that are absent from Sakernas 2000 primarily cover Kalimantan and the island of Papua.

This limitation is expected, as the IFLS dataset, while encompassing approximately 83% of the Indonesian population, represents only 13 of the 27 provinces.[14] The IFLS includes four provinces in Sumatra (North Sumatra, West Sumatra, South Sumatra, and Lampung), all five Javanese provinces (Daerah Khusus Ibukota (DKI) Jakarta, West Java, Central Java, Daerah Istimewa (DI) Yogyakarta, and East Java), and four provinces covering other major island groups (Bali, West Nusa Tenggara, South Kalimantan, and South Sulawesi). However, the IFLS lacks information for Papua and the Maluku Islands as well as substantial parts of almost all islands except for Java. When analyzed by district, Java has the most significant proportion of the covered districts, comprising 90.91% of the total districts, while Sumatra and Bali-Nusa Tenggara are represented by only 50% of the total number of available districts. Meanwhile, Sulawesi and Kalimantan are the least represented, with 37.78% and 30.77% of the available districts, respectively. Consequently, this study can only capture a limited part of the impact of exports on labor market dynamics in the eastern part of Indonesia.

Another caveat is that in some cases, districts that are present in the IFLS data are missing from the Sakernas dataset. In these cases, we utilize the employment structure from the nearest available year in Sakernas. Although this cleaned dataset serves as the primary reference throughout the analysis, we demonstrate later that excluding the missing districts from our analysis does not alter the main conclusions, particularly regarding the impact of exports on formal employment and the progressive impact of exports on Indonesia's labor market.

Table 5 summarizes the descriptive statistics for all variables used in this paper (see Table A2 of Appendix A for the summary statistics of the standardized variables).

[14] IFLS I (1994) and IFLS 2 (1997).

Table 5.
Summary Statistics

Variable	N	Mean	SD	Min	Max
Formal worker in 2000, 1 = yes, 0 = no	5,486	0.47	0.50	0.00	1.00
In labor force in 2000, 1 = yes, 0 = no	6,974	0.80	0.40	0.00	1.00
Employed in 2000, 1 = yes, 0 = no	6,974	0.79	0.41	0.00	1.00
Years of being employed, 2000–2014 (years)	7,017	11.59	4.75	0.00	15.00
Years in formal employment, 2000–2014 (years)	7,017	4.26	5.53	0.00	15.00
Total growth of income, nominal, 2000–2014	4,475	1.47	1.42	-6.26	13.59
Total growth of income, real, 2000–2014	4,475	0.57	1.39	-7.29	12.56
Indonesia's export expansion 2000–2007, 2000 district weight (IDR1,000 per worker)	6,911	2,079.47	3,600.76	-200.43	23,983.23
ASEAN's export expansion 2000–2007, 1997 district weight (IDR 1,000 per worker)	6,911	21,563.16	21,488.39	630.91	234,000.00
Latin America's export expansion 2000–2007, 1997 district weight (IDR 1,000 per worker)	6,911	5,263.50	5,853.66	1,506.51	54,530.27
ASEAN and Latin America's export expansion 2000–2007, 1997 district weight (IDR 1,000 per worker)	6,911	26,827.32	24,684.66	2,137.42	255,000.00
Gender, 1 = male, 0 = female	7,017	0.45	0.50	0.00	1.00
Age in 2000 (years)	7,017	32.66	4.92	25.00	55.00
Father's years of education in 2000 (years)	7,007	0.95	2.80	0.00	17.00
Sufficient ventilation in 2000, 1 = yes, 0 = no	7,007	0.79	0.41	0.00	1.00
Piles of trash around the house in 2000, 1 = yes, 0 = no	7,007	0.12	0.33	0.00	1.00
District's tradable employment, compound annual growth rate 1997–2000 (%)	6,911	3.12	18.76	-52.88	148.50
District's formal employment, compound annual growth rate 1997–2000 (%)	6,743	-1.05	15.60	-48.38	100.40
Province location in 2000 (province code)	7,017	35.28	15.40	12.00	73.00

Source: Authors' calculation based on merged UN Comtrade, Sakernas, and IFLS datasets.

RESULTS AND DISCUSSION

Main Results

Following the empirical specification in Equation (1), we examine whether individuals living in districts more exposed to export expansion to the PRC have better labor market outcomes than those in less exposed ones. Table 6 summarizes the results and reports both the ordinary least squares (OLS) and two-stage least squares (2SLS) estimates for formality and earnings growth. Columns (1) and (4) estimate the impact through the OLS model without controlling for province fixed effects, while Columns (2) and (5) use the full set of control variables. Columns (3) and (6) present the results of the second-stage regression from our 2SLS model, in which the predicted treatment variable $(\hat{REE}_r)$ is used in the regression instead of the actual one after instrumenting it with IV as specified in Equation (3). The results of the first-stage regression are provided in Table 7. All coefficients are measured in standardized values.

Table 6.
The Impact of Export Expansion to the PRC on Formal Employment and Earnings Growth: OLS and 2SLS Comparison

	(1)	(2)	(3)	(4)	(5)	(6)
	Formal Employment			Earnings Growth		
	OLS	OLS	2SLS	OLS	OLS	2SLS
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	0.0571*	0.0519	0.384**	0.00924	0.0142	0.0746
	[0.0268]	[0.0320]	[0.148]	[0.0232]	[0.0268]	[0.0513]
Observations	6,901	6,901	6,901	4,406	4,406	4,406
R^2	0.103	0.116	0.054	0.010	0.018	0.017
Province FE	No	Yes	Yes	No	Yes	Yes
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Kleibergen–Paap F-stat			33.00			36.04

Note: Standard errors are provided in brackets and clustered within districts. The model uses exports from the ASEAN region to the PRC as the instrument and includes the following countries: Brunei Darussalam, Myanmar, Malaysia, the Philippines, Singapore, and Thailand. Individual-level data cover all adult individuals that exist across the three latest IFLS waves: 2000, 2007, and 2014 (balanced panel). Continuous variables are transformed into standardized variables with mean = 0 and standard deviation = 1. Covariates are used across all estimations. The Stock–Yogo (2005) critical value with a 10% maximal bias is 16.38. Significance: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: Authors' calculation.

Based on the IV estimation in Columns (3) and (6), we find that in general, individuals living in districts with greater exposure to export expansion to the PRC tend to have better labor market outcomes in terms of both formal employment and earnings growth by 2014 in cumulative terms. In particular, individuals in districts with a 1 standard deviation larger exposure to export expansion can accumulate larger formal employment later on by almost a 0.4 standard deviation. However, the magnitude of impact is much smaller on earnings growth, with a statistically

insignificant impact (see Table A3 of Appendix A for the full results along with the covariates). The first-stage regression results in Table 7 show that our instrument, namely selected ASEAN countries' exports to the PRC, strongly correlates with Indonesia's exports to the PRC. This supports our argument that Indonesia's export expansion to the PRC from 2000 to 2007 was driven by the PRC's demand shock. If the supply shock specific to Indonesia mattered more, we would not have observed this correlation across different exporters.

Another notable observation from Table 6 is that the impact of export expansion from the OLS model tends to be much smaller than the results from the 2SLS. Since the F-statistics are quite large (larger than the critical value), the amplified coefficients from the 2SLS model are less likely to be caused by a weak instrument. Rather, the smaller coefficient in the OLS model is likely to be driven by endogeneity bias in our treatment variable, associated with an unobserved domestic export supply shock. This attenuation bias has also been discovered in other studies with similar settings, such as Autor et al. (2013), in which endogeneity bias underestimated the impact of imports from the PRC on the US labor market. Therefore, the results from the 2SLS model are preferred.

Table 7.
The Impact of Export Expansion to the PRC: First-Stage Regression

	(1)	(2)
Dependent: Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	Formal Employment Analysis	Earnings Growth Analysis
ASEAN's export expansion 2000–2007, 1997 district weight (standardized)	0.285***	0.283***
	[0.0496]	[0.0471]
Observations	6,901	4,406
Province FE	Yes	Yes
Covariates	Yes	Yes

Note: Standard errors are provided in brackets and clustered within districts.
Significance: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: Authors' calculation.

Despite our F-statistics being greater than the traditional critical value provided by Stock and Yogo (2005; see F-stat in Table 6), there has been a recent debate in the IV literature on how strong an instrument should be to allow for a valid inference (Angrist & Kolesár, 2024; Lee et al., 2022). This is important, as the 2SLS estimator can be unreliable if it suffers from the weak-instrument problem (Andrews et al., 2019). Rather than solely depending on the screening test based on the strength of the F-statistics to make an inference, one can construct confidence intervals for the treatment variable of interest in the second-stage regression under the assumption that the instrument may be weak (Keane & Neal, 2023). Unlike the screening method, the latter approach acknowledges the uncertainty around the parameter estimates and instead develops confidence intervals that may contain true parameters independent of the instrument's strength in the first-stage regression (Andrews et al., 2019). The inference will be valid as long as the point of estimate lies within the constructed confidence sets. This

means that the estimated coefficients still fall within the range of plausibly true parameters that could occur even under weak instruments.

To implement confidence set-based inference, we follow Andrews (2018) in constructing confidence sets that are robust for heteroskedastic, clustered, and serially correlated data (often called *identification-robust confidence sets*). Table 8 presents robust confidence intervals for our treatment variable in the formality and earnings growth analysis. It shows that all of our coefficients of interest still lie within the confidence sets. Taken together, these results suggest that the inference based on the main results in Table 6 remains valid even under the assumption of a weak instrument.

Table 8.
The Impact of Export Expansion to the PRC: Robust Confidence Sets

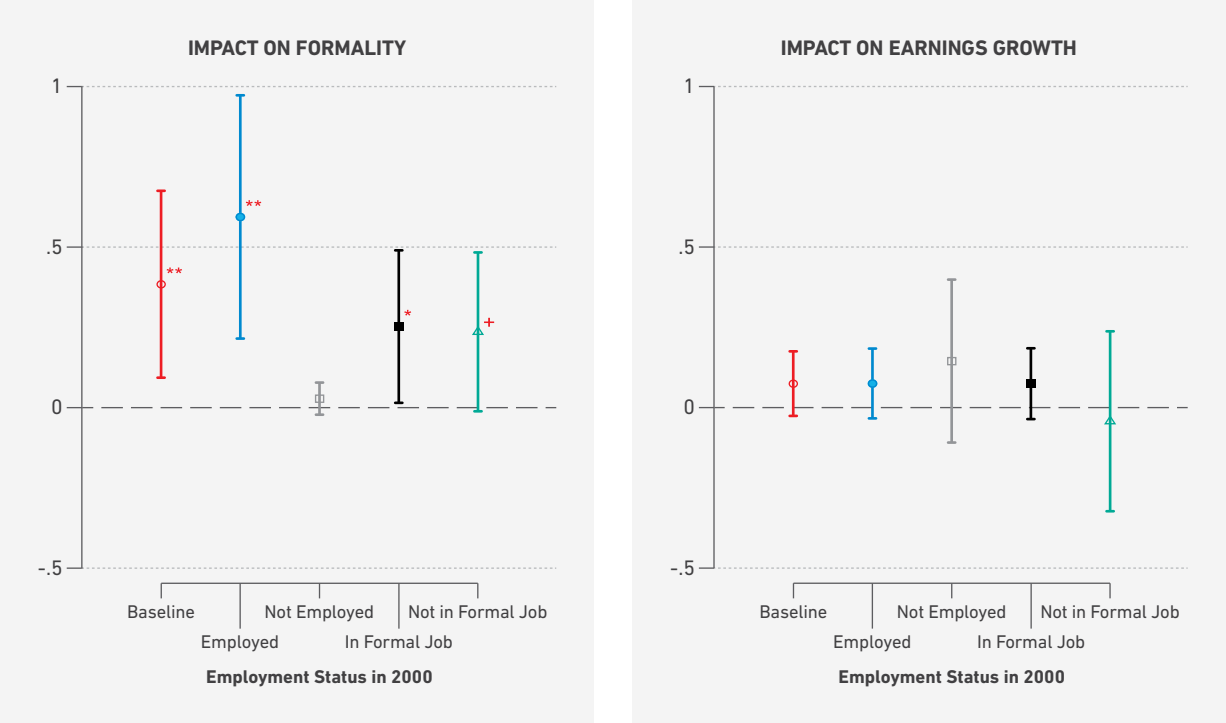
Dependent	Effect of Export Expansion (Point Estimates)	Robust Confidence Sets	Nonrobust (Wald) Confidence Sets
Formal employment	0.384**	[0.02, 0.646]	[0.093, 0.675]
Earnings growth	0.075	[-0.025, 0.186]	[-0.026, 0.175]

Note: Confidence sets are based on 1,000 grid points in the interval of [-0.5, 2]. Robust confidence sets are based on the Anderson–Rubin (AR) test and robust to heteroskedasticity and clustering issues. Wald confidence sets are based on 2SLS estimates and are not robust to weak instruments. Significance: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: Authors' calculation.

We further find that the impact of export expansion on formal employment is significant only among employed individuals (workers) regardless of the employment type in the baseline year of 2000 (see Figure 7). The magnitude of impact is comparable between those who hold formal and informal jobs in 2000: A 1 standard deviation larger exposure to export expansion to the PRC leads to a greater likelihood of holding formal employment in cumulative terms by around 0.2 standard deviations (see Table A4 in Appendix A for the full results). This means that being exposed to greater export expansion increases the chance of workers staying in formal jobs and promotes more transition toward formal employment if they started as informal workers. Meanwhile, we do not observe any discernible impact of export expansion on formal employment prospects by 2014 among individuals who were unemployed in 2000. This further indicates that export expansion improves the quality of jobs mainly through intensive margins, as it mostly affects those who were already working in the starting period. In terms of earnings growth, the impact of export expansion is not statistically significant, regardless of individuals' employment status in 2000 (see Figure 7 and Table A5 in Appendix A for the full results).

Figure 7.
The Impact of Export Expansion to the PRC by Employment Status in the Year 2000



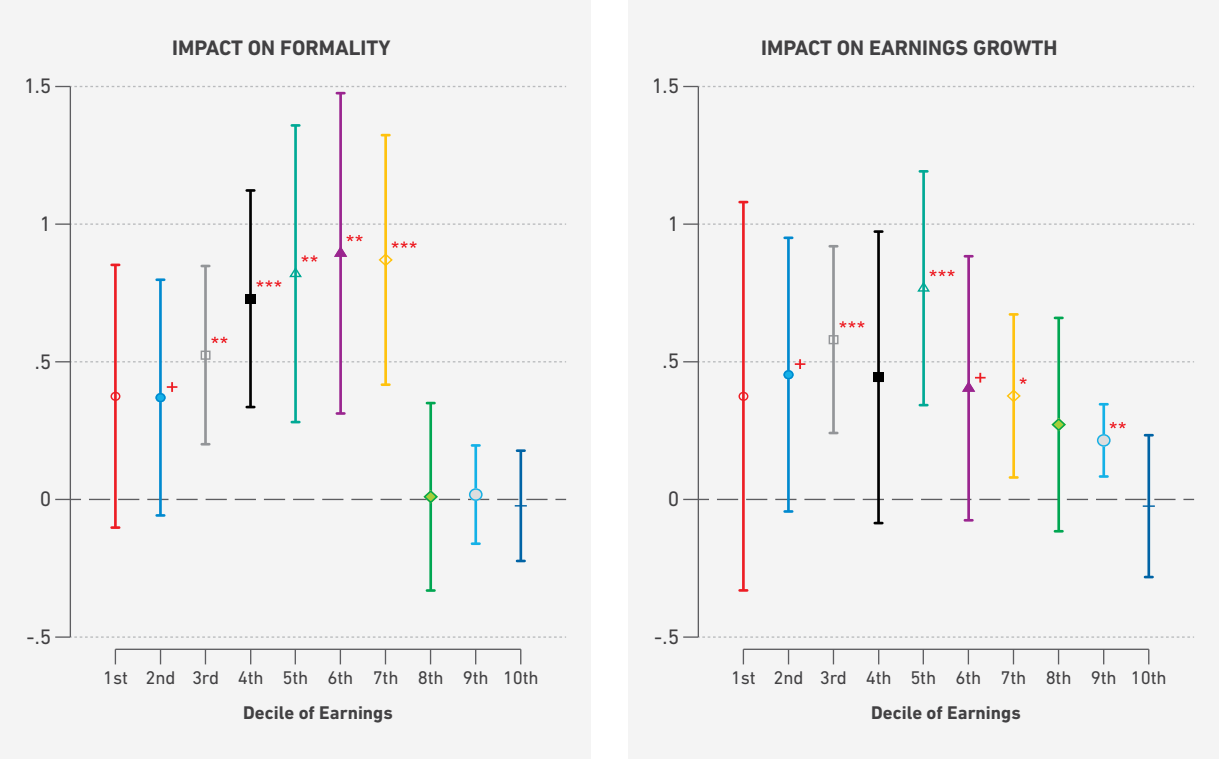
Note: Significance: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: Authors' calculation.

From the equality dimension, we discover that the impact of export expansion to the PRC has been relatively progressive (see Figure 8). Exposure to export expansion raises more formal employment opportunities and earnings growth for individuals in the lower- to middle-income classes, especially those in the third to seventh deciles of earnings in the year 2000 (pre-shock period). Meanwhile, there seems to be no effect for the lowest (first decile) and highest (10th decile) income groups (see Tables A6 and A7 in Appendix A for the full results).

Our findings are consistent with Oktiyanto (2024), who assessed employment dynamics in Indonesia based on IFLS data. He revealed that workers with high earnings tend to remain in the formal sector throughout their careers, especially those in the top 20% earnings bracket. By contrast, workers in the lowest decile of earnings are primarily dominated by nontransitional informal workers. This means that those low-earning workers tend to be trapped in informal employment with limited prospects of transitioning into formal employment. As a result, these types of workers also experience the lowest increase in earnings compared to other workers. The impact of export expansion on formal employment concentrated among the lower- and middle-income classes is therefore consistent with these transitional patterns among workers in the IFLS dataset that tend to be more dynamic for lower- and middle-income groups (see Figure 9). As the expansionary effect in formal employment mostly occurs for these groups of workers, the improvement in earnings growth is also unsurprisingly concentrated among similar groups.

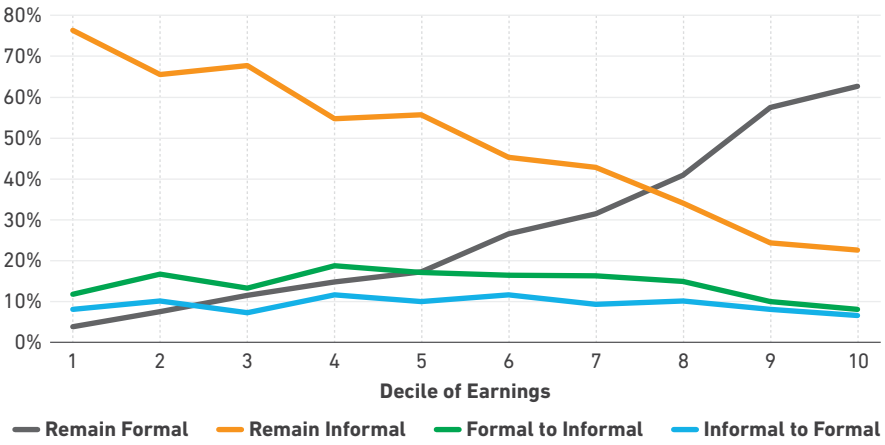
Figure 8.
The Impact of Export Expansion to the PRC by Earnings Decile in the Year 2000



Note: Significance: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: Authors' calculation.

Figure 9.
Transitional Patterns Among Workers with Different Earnings Levelst



Source: Oktiyanto (2024).

Our heterogeneity analysis unveils interesting patterns. First, the cumulative impact of exports on formal employment is more substantial for the group of workers that start with high informality in the pre-shock year of 2000. Understandably, because they initially have a larger share of informality, they have more opportunities to transition into formal employment in later periods as they become more exposed to export expansion. This is particularly true for individuals who start as workers in the agriculture and mining sectors, have low levels of education (primary school or below), and reside outside the island of Java in the year 2000. However, this pattern does not seem to apply to female workers. Despite female workers having more informal employment than their male counterparts in the year 2000, export expansion was not found to stimulate the transition to formality at a higher rate for the former (see Figure 10 and Table 9).

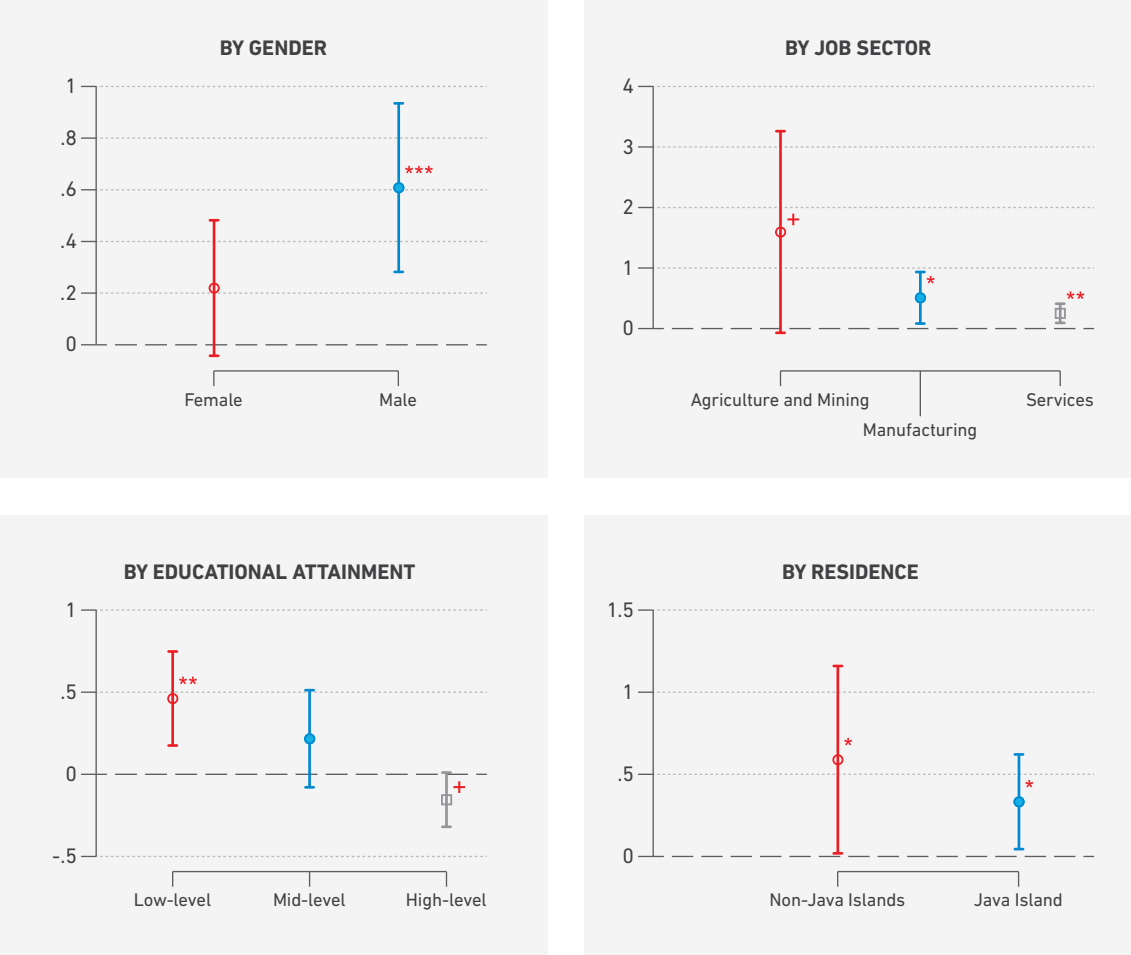
Second, we observe a heterogeneous impact on earnings growth that can be characterized as the Stolper–Samuelson effect but applied to the local level. In particular, as the island of Java is exposed more to export expansion to the PRC (see the previous discussion), the impact on earnings is greater for the factors that are relatively more abundant in that location, which are male workers and, interestingly, workers that start in the services sector (see Figure 11 and Table 10). Meanwhile, export expansion does not produce higher earnings growth for individuals at any education levels (see Tables A8 and A9 in Appendix A for the full results).

Table 9.
Formality Split by Individuals' Characteristics

Group	Number of Workers in 2000			Share of Total Workers in 2000	
	Informal	Formal	Total	Informal	Formal
By Gender					
Female	1,522	914	2,436	62.5%	37.5%
Male	1,367	1,683	3,050	44.8%	55.2%
By Initial Employment					
Agriculture and Mining	1,270	451	1,721	73.8%	26.2%
Manufacturing	292	563	855	34.2%	65.8%
Services	1,325	1,581	2,906	45.6%	54.4%
By Education					
Low level	1,523	886	2,409	63.2%	36.8%
Medium level	995	1,190	2,185	45.5%	54.5%
High level	126	411	537	23.5%	76.5%
By Residence					
Non-Java	1,414	880	2,294	61.6%	38.4%
Java	1,475	1,717	3,192	46.2%	53.8%
Total	**2,889**	**2,597**	**5,486**	**52.7%**	**47.3%**

Source: Authors' calculation.

Figure 10.
Heterogeneous Impact of Export Expansion on Formal Employment



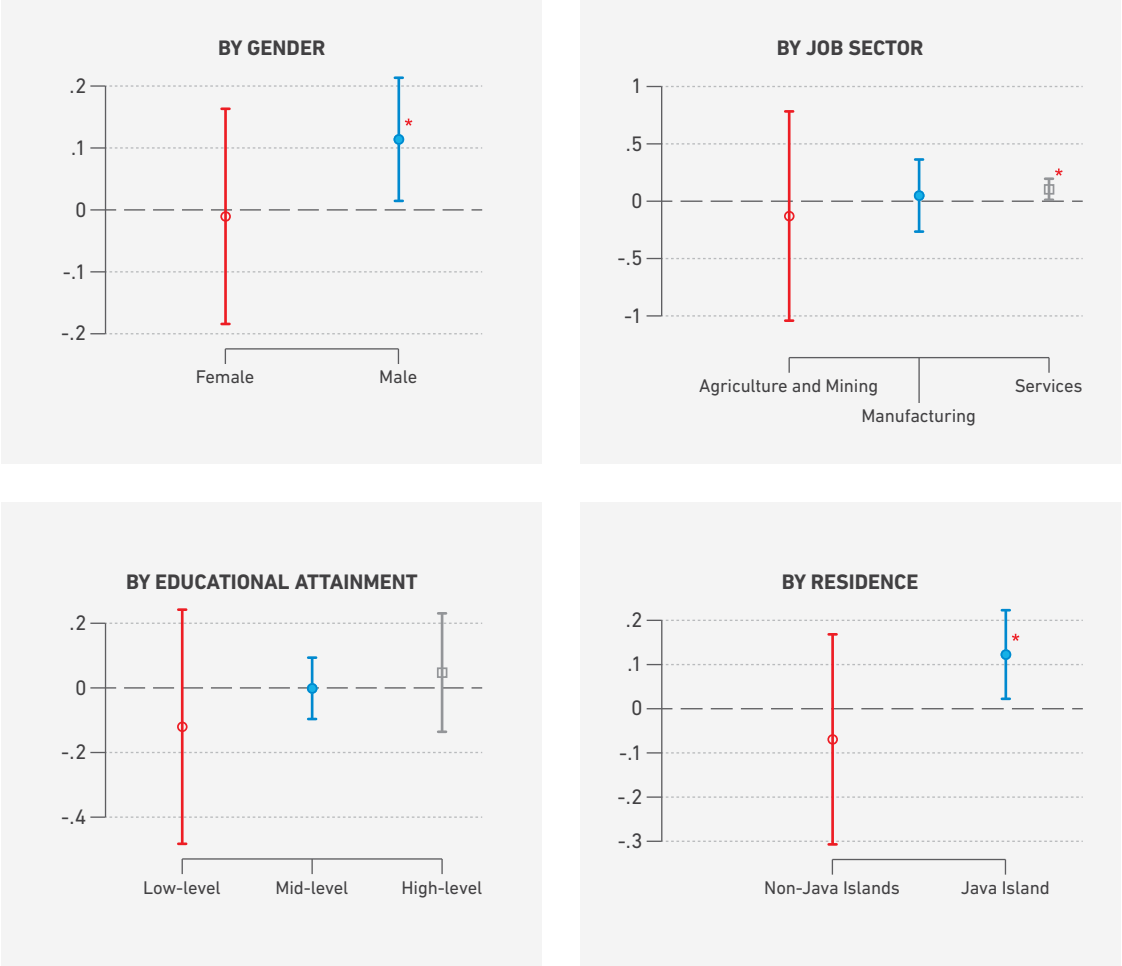
Note: Significance: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: Authors' calculation.

Table 10.
Workers Split by Location

Group	Number of Workers in 2000			Share of Workers in Each Island 2000	
	Non-Java	Java	Total	Non-Java	Java
By Gender					
Female	1,042	1,394	2,436	45.4%	43.7%
Male	1,252	1,798	3,050	54.6%	56.3%
By Initial Employment					
Agriculture and Mining	942	779	1,721	41.1%	24.4%
Manufacturing	234	621	855	10.2%	19.5%
Services	1,117	1,789	2,906	48.7%	56.1%

Figure 11.
Heterogeneous Impact of Export Expansion on Formal Employment



Note: Significance: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: Authors' calculation.

Discussion

The results above are broadly in line with other studies on this topic, such as McCaig (2011) on Viet Nam, Paz (2014) and Costa et al. (2016) on Brazil, and Aragón and Rud (2013) on Peru. These studies, like ours, generally found that exports improved labor market outcomes for affected regions and individuals, especially in terms of income and formal employment. McCaig and Pavcnik (2018) offered an explanation that links exports with changing business environments. They argued that export expansion stimulates the development of export-oriented businesses in the economy. As exporters tend to adhere to formal labor market standards, the expansion in exports will lead to more formal employment.

In our case, however, the improvement in labor market outcomes for workers has been mainly driven by expansion in manufacturing exports. As we include all tradable goods in our analysis, we are able to distinguish the varying impacts that different types of products can have on the labor market. Exploiting variation in districts' sectoral specializations, we compare the impact of export expansion in districts with larger initial endowments in the agriculture and commodity sectors (commodity-reliant districts) with those that have more endowments in the manufacturing sectors (noncommodity-reliant districts). To do this, we first construct the share of employment in the agriculture and commodity sectors in each district, based on employment data in the initial year of 2000. This includes the share of employment in agriculture, hunting, forestry, mining, crude petroleum, and the manufacturing of food, beverages, and tobacco (covering ISIC numbers 11 to 31; see Table A1 of Appendix A). Districts that have an above-median employment share of the agriculture and commodity sectors are considered *commodity-reliant districts*, while the remaining districts are grouped as *noncommodity-reliant districts*, meaning they have a larger employment share of the manufacturing sectors.[15] This strategy distinguishes districts that are more exposed to a commodity export boom from those that are more exposed to manufacturing export expansion.

Table 11 shows that the positive impact of export expansion on formal job opportunities and earnings growth is mostly concentrated in districts with greater specialization in manufacturing activities (noncommodity-reliant districts). Although the coefficients are larger in districts with a greater endowment in the agriculture and commodity sectors, the effects are all statistically insignificant, and their F-stat is very low, suggesting inflated estimates due to a weak-instrument problem. Meanwhile, the estimates for the groups of noncommodity-reliant districts have much stronger first-stage results and still lie between the identification-robust confidence intervals, whichallows us to make inferences even under weak-instrument assumptions. This indicates that the improvement in labor market outcomes in our results is mainly driven by the effects of manufacturing export expansion.

[15] We classify ISIC 31 (Manufacture of Food, Beverages, and Tobacco) within the commodity group, alongside agriculture and mining products, as this sector is predominantly driven by palm oil–related activities.

Table 11.
Heterogeneous Impact of Export Expansion to the PRC on Formality and Earnings Growth: 2SLS Estimation by Districts' Endowment

	(1)	(2)	(3)	(4)
	Formality		Earnings Growth	
	Noncommodity-Reliant Districts	Commodity-Reliant Districts	Noncommodity-Reliant Districts	Commodity-Reliant Districts
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	0.322*	2.255	0.110*	-5.115
	[0.144]	[4.802]	[0.0501]	[16.63]
Observations	4,402	2,499	2,876	1,530
R^2	0.070	-1.276	0.019	-5.358
Province FE	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes
Kleibergen–Paap F-stat	45.99	0.213	47.24	0.0973
Robust CS (lower bound)	-0.037	N.A.	0.016	N.A.
Robust CS (upper bound)	0.561	N.A.	0.218	N.A.
Nonrobust (Wald) CS (lower bound)	0.041	-7.157	0.012	-37.708
Nonrobust (Wald) CS (upper bound)	0.604	11.667	0.208	27.478

Note: The IV regression is applied separately for these two groups. Standard errors are provided in brackets and clustered within districts. The model uses exports from the ASEAN region to the PRC as the instrument and includes the following countries: Brunei Darussalam, Singapore, Myanmar, Malaysia, the Philippines, and Thailand. Individual-level data cover all adult individuals that exist across the three latest IFLS waves: 2000, 2007, and 2014 (balanced panel). Continuous variables are transformed into standardized variables with mean = 0 and standard deviation = 1. Covariates are used across all estimations. The Stock–Yogo (2005) critical value with 10% maximal bias is 16.38. Robust confidence sets (CS) are based on the Anderson–Rubin (AR) test and robust to heteroskedasticity and clustering issues. Wald CS are based on 2SLS estimates and are not robust to weak instruments. N.A. means that narrow confidence sets cannot be identified. Significance: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Source: Authors' calculation.

The impact of export expansion on the labor market is not always clear-cut in the literature, especially for resource-rich nations such as Indonesia. In these economies, an export expansion driven by a foreign demand shock typically raises commodity exports more than others. This boom in commodity exports can shift productive factors into the commodity sectors and, consequently, nontradable services (Corden & Neary, 1982). This is because the exchange rate tends to appreciate following a commodity boom episode, which weakens the competitiveness of manufacturing exports. As the manufacturing sector performs weakly, this translates to the contraction of its role in the economy and the declining ability to provide formal jobs, leading to adverse labor market outcomes for workers. This is popularly referred to as the *Dutch disease phenomenon*.

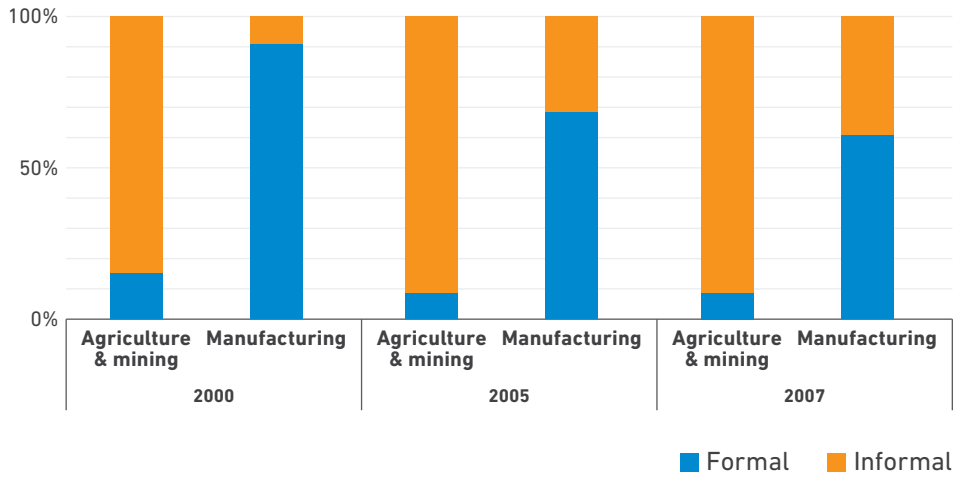
The prevailing view is that the export boom in Indonesia in the early 2000s, which was driven by the rise of the PRC's demand for commodities, produced labor market effects that resembled the Dutch disease phenomenon. This is characterized by poor manufacturing sector performance, worsening inequality, stubbornly high informality, and stagnating earnings for many workers

(Coxhead & Shrestha, 2016; Shrestha & Coxhead, 2018, 2020; Wihardja, 2016). Even though this is not the only view held by observers on Indonesia,[16] it raises concerns about whether reliance on commodity exports can actually be detrimental to the Indonesian economy.

Our study does not share this bleak view. Measuring export expansion in all tradable sectors, including commodities, we found that formality improves and earnings grow faster for those exposed more to export expansion to the PRC. In addition, we found export expansion to the PRC to be relatively progressive, as the effect is felt chiefly by individuals in lower- and middle-income groups. We argue that the differences in the results could be driven by the sectoral coverage in this paper, which focuses not only on commodities but also on the broader manufacturing sectors (see the complete list in Table A1 of Appendix A). As shown in Figure 6, Indonesia experienced not only a substantial increase in the export of commodities, especially palm oil and mining products, but also a meaningful growth in the export of manufactured products, albeit to a much lesser extent. The findings in Table 11 suggest that the expansion in manufacturing exports has impacted labor market performance differently than the export of commodities. This means that to get a fuller picture of the impact of an export boom, it is essential to cover manufacturing exports apart from commodity ones.

The improvement in formal employment has a lot to do with the types of jobs created by the manufacturing sector. Figure 12 clearly shows that most jobs in the manufacturing sector are formal. Meanwhile, workers in the agriculture, commodity, and resources sectors mainly hold informal employment. Formal jobs tend to have less volatile earnings dynamics and are better paid than informal ones (Paz, 2014; Oktiyanto, 2024; Ulyssea, 2020). Therefore, an improvement in labor market outcomes is more likely to occur under an expansion in manufacturing exports rather than commodity ones.

Figure 12.
Formality Split by Sectors



Source: Authors' calculation from Sakernas datasets.

[16] Edwards (2019) has painted a rather contrasting picture in which the palm oil boom helped lift people out of poverty and raise consumption growth.

These results highlight the importance of maintaining the manufacturing sector's competitiveness. As a commodity-dependent nation, Indonesia is often exposed to commodity boom-and-bust cycles. The findings from our paper underline that a boom driven mainly by the rise in commodity demand does not necessarily have to lead to worsening labor market outcomes as predicted by the Dutch disease framework. The key here is to maintain the competitiveness of manufacturing exports. This is not, by any means, a new finding in the literature. However, our paper is the first to show empirically that in the case of Indonesia, individuals living in districts more exposed to manufacturing export expansion are better off than those living in districts that are heavily commodity driven.

However, this does not mean that we can totally rule out the role of a commodity export boom in keeping informality and inequality high during a boom period (Coxhead & Shrestha, 2016). After all, the ability of Indonesia's manufacturing sector to provide formal employment showed a declining trend during the boom period of the 2000s (see Figure 13). Unfortunately, the main caveat of our empirical strategy is that it is not designed to interpret any aggregate trend at the national level. Our empirical specification can instead only capture the relative impact of export expansion across different individuals with varying exposure levels. As such, explaining the aggregate trend will require a more general equilibrium approach rather than a micro-econometric one.

Role of Internal Migration

Internal migration, which is the movement of people within a nation from one region to another, can impact income and job status in various ways. Workers who relocate to high-growth areas often find better job opportunities and frequently earn higher wages due to the increased demand for workers. In light of this, it is crucial to examine whether migration plays a role in our analysis.

Using data from five waves of the IFLS and a study by Pardede et al. (2020), we analyzed the number of internal migrants and found a slight change in the migration rate with a decreasing trend. On average, the rate of internal migration from 1993 to 1997 was 1.53%, which increased to 2.97% from 1997 to 2000, then decreased to 2.03% from 2000 to 2007, and further dropped to 1.83% from 2007 to 2014. Looking at the movement at subregional levels, the 1993–2014 data show that migration was dominated by inter-district movement, followed by inter-subdistrict (kecamatan) movement, while inter-provincial movement ranked the lowest (see Table 12). The pattern for 2000–2014 also shows a decreasing trend compared to 1993–2000, with inter-subdistrict migration decreasing from 0.86% to 0.71%, inter-district migration dropping from 0.84% to 0.74%, and inter-provincial migration declining from 0.51% to 0.49%. Further analysis by income quantile (see Table 12) indicates that the majority of migrants come from higher-income levels, with this trend becoming more pronounced in the 2000–2014 period than in 1993–2000, when most migrants were from the wealthiest 20% of the population.

Table 12.
Annual Percentage of Migrants for Inter-Kecamatan Within a Kabupaten (Sub), Inter-Kabupaten Within a Province (Dist), and Inter-Province (Prov) by Survey Period

	Average 1993–2014			Average 1993–2000			Average 2000–2014		
	Sub	Dist	Prov	Sub	Dist	Prov	Sub	Dist	Prov
Total	0.78	0.79	0.50	0.86	0.84	0.51	0.71	0.74	0.49
Quintile									
Q1 (lowest 20% households by income)	0.69	0.50	0.25	0.76	0.54	0.20	0.63	0.45	0.29
Q2	0.70	0.64	0.35	0.80	0.62	0.35	0.59	0.65	0.35
Q3	0.75	0.81	0.42	0.82	0.87	0.40	0.68	0.75	0.44
Q4	0.95	0.99	0.65	1.04	1.11	0.76	0.86	0.87	0.54
Q5	0.89	1.19	1.04	0.88	1.19	1.02	0.90	1.19	1.05
Origin (pre-migration)									
Sumatera	1.01	0.96	0.53	1.06	1.02	0.54	0.97	0.90	0.52
Java	0.65	0.70	0.60	0.69	0.78	0.63	0.61	0.63	0.57
Others	0.89	0.83	0.19	1.08	0.80	0.16	0.70	0.85	0.22
Area (pre-migration)									
Urban	0.85	0.99	0.66	0.92	1.08	0.72	0.78	0.91	0.61
Rural	0.72	0.59	0.35	0.80	0.62	0.33	0.63	0.57	0.37
N	128,577			57,180			71,397		

Note: (a) Calculation based on IFLS 1993, 1997, 2000, 2007, and 2014; (b) migration: the number of people who changed their residence between two waves of IFLS.

Source: Pardede et al. (2020), recalculated.

These figures suggest that during the period analyzed, internal migration rates may not have significantly contributed to overall labor market changes. The findings from Pardede et al. (2020) support this view, showing a declining trend in inter-kecamatan, inter-kabupaten, and inter-provincial migration after the peak period of 1997–2000, indicating that internal migration has become less frequent over time. Moreover, they pointed out that Indonesia's crude migration intensity (CMI) is relatively low compared to other countries, reinforcing the notion that internal migration may not have a significant impact on export-driven labor market outcomes. This declining trend suggests that even with significant export growth, migration rates may not necessarily increase proportionately, thereby reducing the likelihood that internal migration will significantly impact labor market outcomes.

Furthermore, data from two major islands (Sumatera and Java; see Table 12) show a decrease in all types of migration, with only a slight increase in inter-district movements from other

islands. However, the representation of other islands in the IFLS is minimal. The urban-to-urban migration trend is still dominant for all types of movements. This decreasing pattern suggests that the impact of the 2000–2014 export expansion did not significantly alter the migration patterns of Indonesian migrants. A study by Sugiyarto et al. (2019) revealed that internal migration in Indonesia primarily occurs at the individual level, with the majority of movements happening within provinces. This suggests that most internal migration involves relocation within existing localities, primarily urban to urban or rural to rural, with limited cross-provincial migration. However, the analysis found that the number of rural migrants who moved across provinces increased in 2000–2014 compared to 1993–2000. Pardede et al. (2020) suggested that in Sumatra, rural residents are more likely to migrate inter-provincially than urban residents. They also concluded that migration originating from urban areas was more significant than migration from rural areas in most regions during the period 1993–2014. This does not align with our results, which highlight the importance of manufacturing during the export expansion era, suggesting that migration may play a secondary role in altering labor market outcomes due to export expansion.

Overall, these findings suggest that while internal migration can play a role in labor market outcomes, particularly in response to economic stability and export growth, its influence on specific labor market outcomes due to export expansion appears limited. The study by Autor et al. (2014) supports this idea, indicating that migration's role in shaping labor market changes due to export booms may be limited. Their research showed that high-wage workers are more likely to relocate in response to trade exposure, suggesting that migration driven by export expansion tends to involve individuals with more flexibility and resources. This pattern indicates that migration associated with export growth may not include the broader labor force, thereby suggesting a limited impact on overall labor market outcomes.

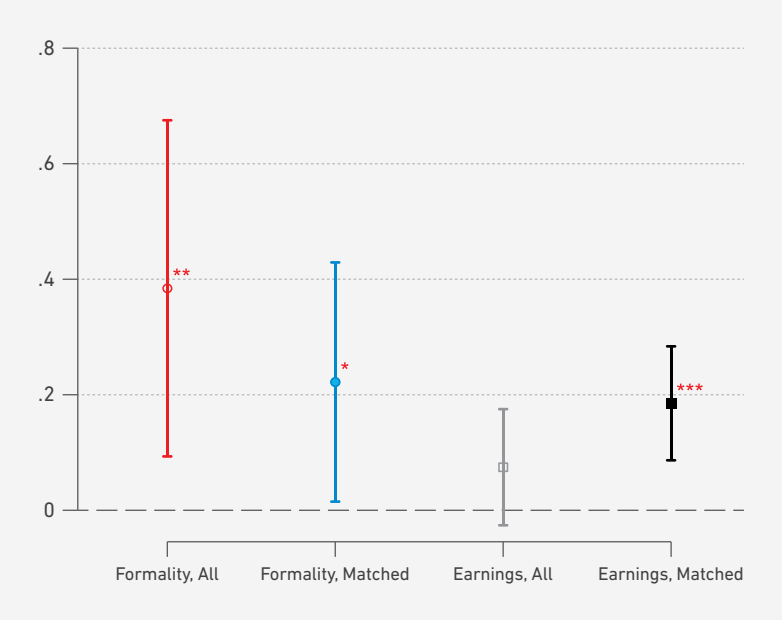
However, our migration analysis is based only on simple descriptive statistics and does not involve causal and mechanism analysis. Further examination is needed to determine whether export expansion impacts migration and whether migration changes our results on formal employment opportunities and earnings growth.

Robustness and Sensitivity Test

An immediate concern about our empirical strategy is whether differences in labor market performance are driven by systematic differences in individuals' characteristics across different exposure sites. To address this concern, we perform our IV regression within a more limited sample of individuals with comparable characteristics across exposure sites. First, individuals living in districts where exposure to export expansion is higher than the 75th percentile are assigned to the treatment group, while the rest are assigned to the control group. Then, we apply the propensity score matching technique, specifically using the one-to-one nearest neighbor matching method to match the treated observations with corresponding observations in the control group. We select matched individuals based on several characteristics from the initial period of 2000, including formality status, real yearly income level, education level, father's educational background, gender, age, and living conditions. Figures A1 and A2 in Appendix A demonstrate that fairly balanced samples are achieved through our matching procedures.

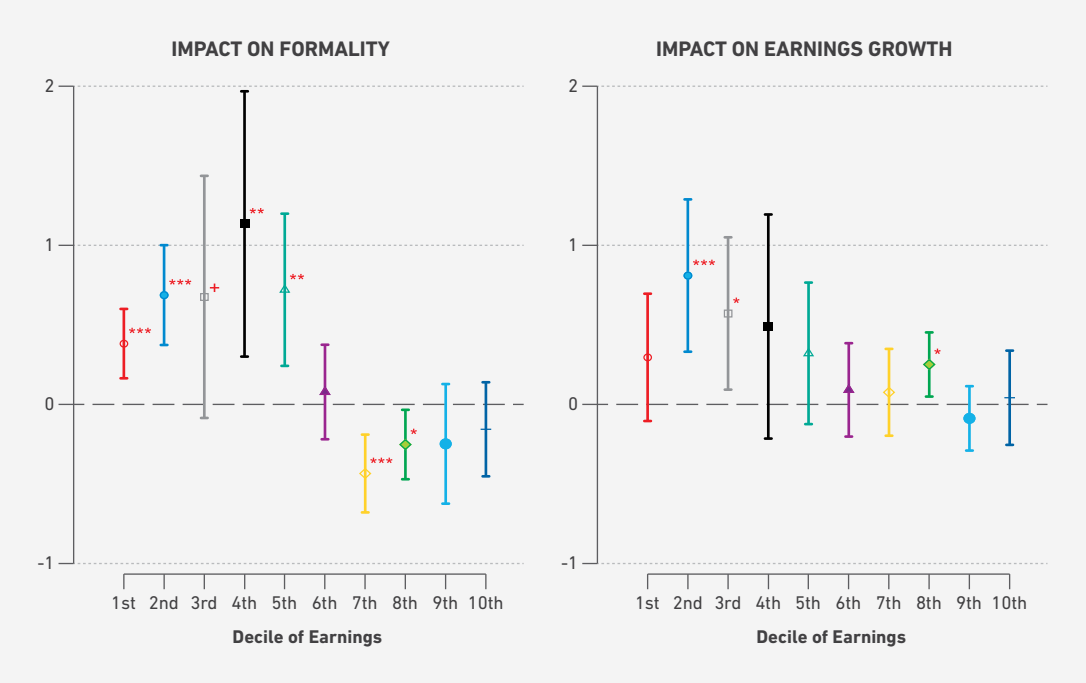
Figure 13 shows that using only matched observations, we still arrive at the same conclusion as the main model: Export expansion had boosted individuals' formal employment opportunities and earnings growth by the end of 2014 in cumulative terms. Notably, the impact on earnings growth became larger and statistically significant (see Table A10 in Appendix A for the full results). In addition, analysis using the matched observations suggests a similar progressivity story to that in the main results, where the enhancement in formal job opportunities and earnings growth due to export expansion is primarily directed toward individuals in the lower- to middle-income brackets (see Figure 14). However, a notable difference from the main results (in Figure 8) is that in the matched datasets, the impacts are more concentrated at the middle–lower earnings levels and less at the middle–upper levels (see Tables A11 and A12 in Appendix A for the full results).

Figure 13.
The Impact of Export Expansion on Formality and Earnings Growth: 2SLS Estimation—Matched Datasets



Source: Authors' calculation.

Figure 14.
The Impact of Export Expansion to the PRC by Earnings Decile in the Year 2000: Matched Datasets



Source: Authors' calculation.

Another source of concern comes from the exclusion restriction assumption in our IV model. The standard Hansen J-statistics have been shown to be unable to provide a definitive answer to the fulfillment of the exclusion restriction assumption (Parente & Santos Silva, 2012). Instead of proving that the assumption is met, one can test whether the conclusion remains robust when the exclusion restriction assumption is altered.

In this regard, we follow Conley et al. (2012) in setting the instruments as plausibly rather than strictly exogenous. This means deliberately allowing our instrument to have a direct effect on the outcomes. The direct effect of IV is obtained from the subset of data in which the impact of the instrument does not differ from zero (insignificant) in the first-stage regression (Van Kippersluis & Rietveld, 2018). This subset of data is often called the *zero-first-stage group*. In our case, the zero-first-stage group is obtained by focusing on the districts that have a low level of export expansion (below median) and specialize in the agriculture and commodity sectors. In this subset of data, our treatment variable does not correlate statistically with the instrument. From this, we take the coefficient of IV in the reduced-form regression as the direct impact of IV on the outcome. We then check whether the results based on the more flexible assumption differ from the main model. The results in Table 13 suggest that making the IV assumption more flexible does not change the main conclusion: Export expansion still leads to better formal employment opportunities and earnings growth in cumulative terms.

Next, we examine whether our main estimate is sensitive to alternative specifications and choices of data. In particular, we modify three aspects of our main model. First, concerning IV, we experiment with two alternatives: (i) We add a new instrument, which is the exports of selected Latin American

countries to the PRC.[17] (ii) We combine both ASEAN and Latin American exports to the PRC as a joint instrument. The second modification involves the covariates. There is concern that our formal employment prospects might be influenced by the initial trend that was underway before the PRC shock. To address this, we use formal employment growth from 1997 to 2000 as our district-level control variable instead of tradable employment growth. This adjustment aims to minimize the risk of contaminating our formality analysis with formal job growth trends at the district level. Finally, we exclude districts with incomplete information from Sakernas for certain years rather than imputing this information from sectoral employment structures for the closest available years.

Figure 15 shows that the impact of export expansion remains consistent. Exposure to export expansion to the PRC continues to improve formal employment outcomes and earnings growth among individuals living in more exposed districts. However, the impact of export expansion on total earnings growth is only statistically significant when using two IVs (ASEAN and Latin American exports to the PRC). The progressivity of the impact is also maintained when incomplete data are excluded from our analysis rather than imputed (see Figure 16). In general, these results suggest that our main findings are relatively robust, as they survive various robustness and sensitivity checks.

Table 13.
The Impact of Export Expansion to the PRC on Formal Employment and Earnings Growth: 2SLS vs. Plausibly Exogenous Model

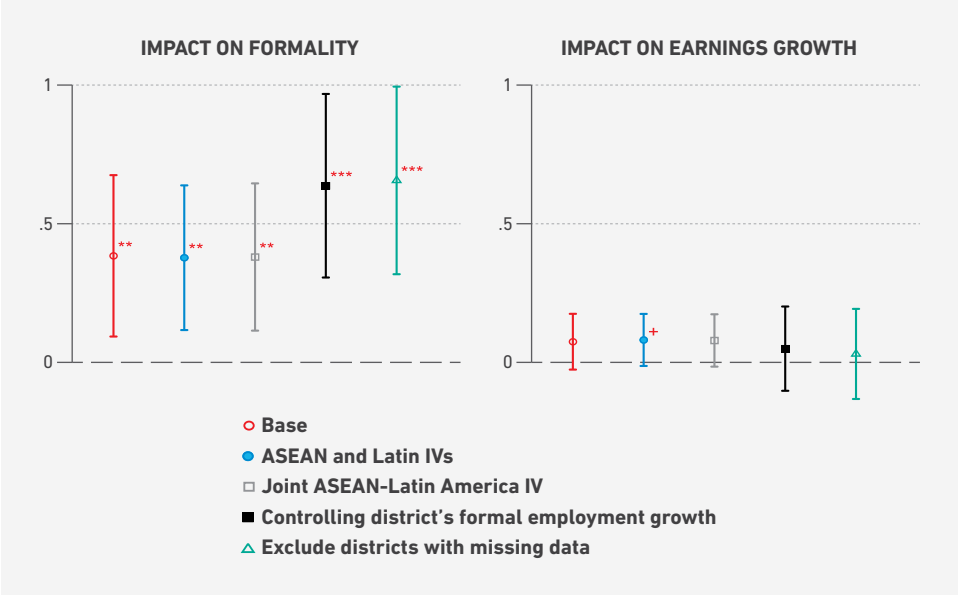
	(1)	(2)		(3)		(4)	(5)	(6)
	Formality					Earnings Growth		
	2SLS	Plausibly Exogenous (Without Uncertainty)		Plausibly Exogenous (With Uncertainty)		2SLS	Plausibly Exogenous (Without Uncertainty)	Plausibly Exogenous With Uncertainty)
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	0.384**	0.527***		0.527***		0.0746	0.0997**	0.0997*
	[0.148]	[0.0881]		[0.0924]		[0.0513]	[0.0361]	[0.0438]
Observations	6,901	6,911		6,911		4,406	4,412	4,412
R^2	0.054					0.017		
Province FE	Yes	Yes		Yes		Yes	Yes	Yes
Covariates	Yes	Yes		Yes		Yes	Yes	Yes
Robust F-stat	33.00					36.04		

Note: We test whether the results change when a violation of the exclusion restriction assumption is allowed. Regions where export expansion is below the median (p50) and more commodity reliant are grouped as the zero-first-stage group. In these regions, Indonesia's export expansion to the PRC does not correlate statistically with that of the ASEAN countries. Thus, a reduced-form coefficient can be taken as the direct impact of IV on the outcome. The direct-effect coefficient serves as the level of exclusion restriction violation in our sensitivity test. The plausibly exogenous IV model corrects for a potential direct effect of IV on the outcome. The model with uncertainty includes standard errors of the direct impact of IV on the outcome from the reduced-form regressions, while the one without uncertainty assumes no deviation from the level of violation. Significance: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: Authors' calculation.

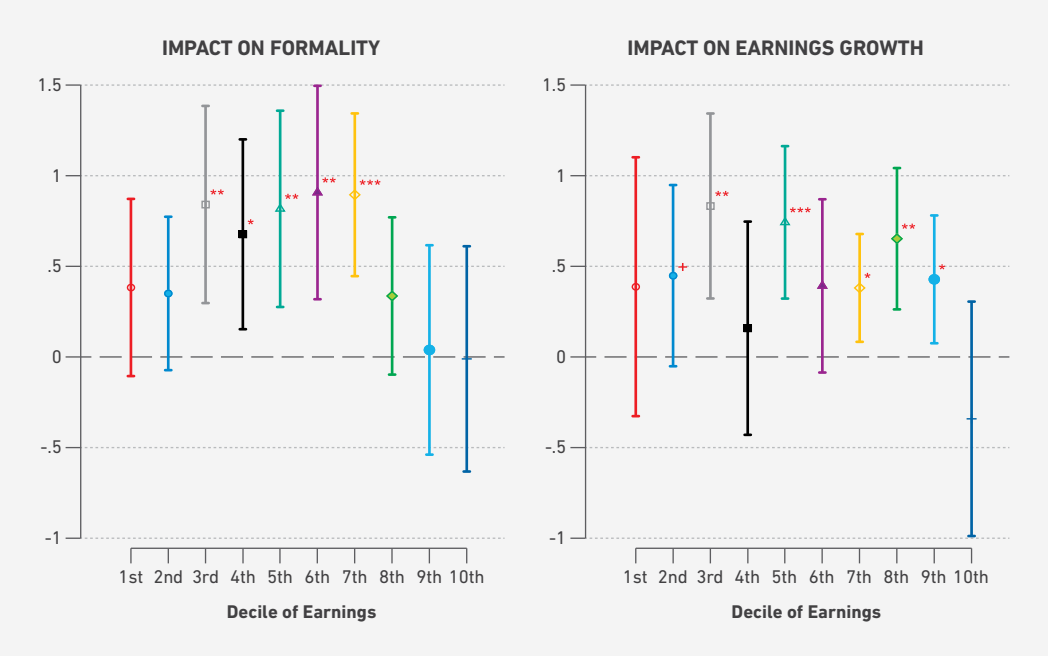
[17] The Latin American countries include Argentina, Brazil, Chile, Mexico, Paraguay, Peru, Uruguay, and Venezuela. They were also the founding members of the WTO in 1995.

Figure 15.
Sensitivity Analysis



Source: Authors' calculation.

Figure 16.
Heterogeneity Analysis: Sample Excludes Missing Data



Source: Authors' calculation.

CONCLUSIONS AND IMPLICATIONS

Developing economies' participation in the export market has expanded considerably in the last two to three decades. However, there is no clear evidence that this has improved labor market outcomes. Informality remains persistently high, and inequality, in a broader sense, has risen in many parts of developing economies. Additionally, some studies have linked commodity-driven export expansion with the Dutch disease effect, arguing that export expansion will not necessarily lead to improved labor market performance, as it can simultaneously weaken the manufacturing sector, which is a major provider of formal jobs in the economy.

We revisit this issue by studying the export expansion episode of a major commodity-dependent nation, namely Indonesia. Rather than focusing solely on commodity exports, we measure all export changes in tradable goods. To isolate exogenous variation in Indonesia's exports, we focus on Indonesia's export expansion to the PRC between 2000 and 2007. This period represents the time when the PRC dramatically rose as a major importer in the world economy following its accession to the WTO. This exogenous import demand shock in the PRC increased exports not only from Indonesia but also from other developing countries in Asia and Latin America. We then assess the impact of this export expansion to the PRC on individuals' labor market outcomes, using data from the IFLS database. In particular, we compare the total number of years spent in formal employment and earnings growth from 2000 to 2014 of individuals living in districts with greater exposure to export expansion to the PRC relative to those in less exposed ones. We further gauge the equality of this export expansion by analyzing the heterogeneous impact of export expansion across individuals with different positions in the income distribution.

We discover that individuals living in districts with greater exposure to export expansion to the PRC between 2000 and 2007 tend to have larger formal employment prospects in cumulative terms. The overall impact on total earnings growth is also positive but not statistically significant. We find that the impact of export expansion has been relatively progressive, with improvements in formal job opportunities and earnings growth directed mostly toward individuals in the lower- and middle-income brackets. These results remain consistent even when the instrument is assumed to be weak and when violating the exclusion restriction assumption. The pattern of inference does not change when we experiment with different specifications, data treatment techniques, and IV constructions.

These results are primarily underpinned by the effect of manufacturing export expansion. Due to the PRC's emergence in the global economy, Indonesia experienced not only a substantial increase in the export of commodities but also a meaningful growth in the export of manufactured products. We discover that the positive impact of export expansion on formal job opportunities and earnings growth is mostly concentrated in districts with greater specialization in manufacturing activities, whereas there appears to be no statistically significant effect for individuals in commodity-reliant districts. This likely relates to the nature of the manufacturing sector, which tends to absorb more formal rather than informal employment. Formal jobs are typically more secure and offer better salaries. Therefore, improvements in labor market outcomes are more likely to occur under the expansion of manufacturing exports rather than commodity exports. These findings highlight the importance of maintaining the manufacturing sector's competitiveness in a commodity-dependent nation like Indonesia as a source of improved labor market performance.

The main caveat of our empirical strategy is that it is not designed to interpret any aggregate trend at the national level. The research design employed by this study can only assess the relative impact of exports across individuals living in different exposure sites. This means we cannot link the rising role of commodity exports during the export boom period with the PRC and the resulting high informality and inequality at that time. In our view, explaining these aggregate trends requires a more general equilibrium approach rather than a micro-econometric one. This could be a promising avenue for future research. Another limitation of this paper is that the empirical design holds individuals' residences fixed in the initial period before the PRC's accession to the WTO. Although this is needed to avoid sorting effects, it cannot explain labor mobility as a result of a major export shock. We show that the role of internal migration in our data appears to be limited and less likely to alter the inference. This is due to its small magnitude and declining trend over time. However, this is based purely on descriptive works and does not address whether exports induce workers to move across regions and sectors—another topic central to trade theory that remains an open empirical puzzle.

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APPENDIX

Supplementary Tables and Figures

Table A1.
Sectoral Classification of Tradable Employment (Two-Digit ISIC)

ISIC Rev. 2	Description
11	Agriculture and Hunting
12	Forestry and Logging
13	Fishing
21	Coal Mining
22	Crude Petroleum and Natural Gas Production
23	Metal Ore Mining
29	Other Mining
31	Manufacture of Food, Beverages, and Tobacco
32	Textile, Wearing Apparel, and Leather Industries
33	Manufacture of Wood and Wood Products, Including Furniture
34	Manufacture of Paper and Paper Products, Printing, and Publishing
35	Manufacture of Chemicals and Chemical Products, Petroleum, Coal, Rubber, and Plastic Products
36	Manufacture of Nonmetallic Mineral Products, Except Products of Petroleum and Coal
37	Basic Metal Industries
38	Manufacture of Fabricated Metal Products, Machinery, and Equipment
39	Other Manufacturing Industries

Table A2.
Descriptive Statistics for the Data Estimation (Standardized)

Variable	N	Mean	SD	Min	Max
Formal worker in 2000, 1 = yes, 0 = no	5,486	0.47	0.5	0	1
In labor force in 2000, 1 = yes, 0 = no	6,974	0.8	0.4	0	1
Employed in 2000, 1 = yes, 0 = no	6,974	0.79	0.41	0	1
Years of being employed, 2000–2014 (standardized)	7,017	0	1	-2.44	0.72
Years in formal employment, 2000–2014 (standardized)	7,017	0	1	-0.77	1.94
Total growth of income, nominal, 2000–2014 (standardized)	4,475	0	1	-5.43	8.52
Total growth of income, real, 2000–2014 (standardized)	4,475	0	1	-5.68	8.66
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	6,911	0	1	-0.63	6.08
ASEAN's export expansion 2000-2007, 1997 district weight (standardized)	6,911	0	1	-0.97	9.86
Latin America's export expansion 2000–2007, 1997 district weight (standardized)	6,911	0	1	-0.64	8.42
ASEAN–Latin America's export expansion 2000–2007, 1997 district weight (standardized	6,911	0	1	-1	9.25
Gender, 1 = male, 0 = female	7,017	0.45	0.5	0	1
Age (years) in 2000 (standardized)	7,017	0	1	-1.56	4.54
Father's years of education in 2000 (standardized)	7,007	0	1	-0.34	5.74
Sufficient ventilation in 2000, 1 = yes, 0 = no	7,007	0.79	0.41	0	1
Piles of trash around the house in 2000, 1 = yes, 0 = no	7,007	0.12	0.33	0	1
District's tradable employment, compound annual growth rate 1997–2000 (standardized)	6,911	0	1	-2.99	7.75
District's formal employment, compound annual growth rate 1997–2000 (standardized)	6,743	0	1	-3.03	6.5
Province location in 2000	7,017	35.28	15.4	12	73

Table A3.
The Impact of Export Expansion to the PRC on Formal Employment and Earnings Growth: OLS and 2SLS Comparison—Full Results

	(1)	(2)	(3)	(4)	(5)	(6)
	Formal OLS	Formal OLS	Formal 2SLS	Earnings OLS	Earnings OLS	Earnings 2SLS
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	0.0571*	0.0519	0.384**	0.00924	0.0142	0.0746
	[0.0268]	[0.0320]	[0.148]	[0.0232]	[0.0268]	[0.0513]
Gender, 1 = male, 0 = female	0.560***	0.557***	0.560***	0.000722	-0.00201	-0.00258
	[0.0333]	[0.0329]	[0.0330]	[0.0321]	[0.0317]	[0.0315]
Age (years) in 2000 (standardized)	-0.0429**	-0.0445**	-0.0450**	-0.0825***	-0.0836***	-0.0845***
	[0.0138]	[0.0140]	[0.0140]	[0.0160]	[0.0160]	[0.0160]
Father's years of education in 2000 (standardized)	0.0837***	0.0801***	0.0799***	0.0137	0.0132	0.0123
	[0.0125]	[0.0128]	[0.0129]	[0.0139]	[0.0136]	[0.0136]
Sufficient ventilation in 2000, 1 = yes, 0 = no	0.0862**	0.101**	0.111**	0.0577	0.0455	0.0464
	[0.0326]	[0.0326]	[0.0358]	[0.0429]	[0.0414]	[0.0416]
Piles of trash around the house in 2000, 1 = yes, 0 = no	-0.252***	-0.244***	-0.241***	-0.0904+	-0.110*	-0.109*
	[0.0403]	[0.0375]	[0.0462]	[0.0520]	[0.0506]	[0.0510]
District's tradable employment, cumulative annual growth 1997–2000 (standardized)	-0.0167	-0.0254	0.00141	-0.0190	-0.0201	-0.0147
	[0.0244]	[0.0253]	[0.0418]	[0.0219]	[0.0212]	[0.0212]
Sumatera Barat		0.121	0.0910		0.101	0.0942
		[0.101]	[0.103]		[0.0979]	[0.0912]
Riau		-0.0737	-0.314		-0.147	-0.182
		[0.206]	[0.230]		[0.226]	[0.217]
Sumatera Selatan		-0.0454	-0.0455		0.307***	0.306***
		[0.154]	[0.147]		[0.0612]	[0.0611]
Lampung		-0.280	-0.263+		0.0395	0.0403
		[0.201]	[0.152]		[0.0911]	[0.0958]

DKI Jakarta		0.116	-0.749		0.0367	-0.120
		[0.125]	[0.545]		[0.0979]	[0.185]
Jawa Barat		0.101	0.0394		0.0205	0.00940
		[0.0830]	[0.0913]		[0.0695]	[0.0681]
Jawa Tengah		0.145	0.133		-0.0559	-0.0594
		[0.100]	[0.100]		[0.0941]	[0.0912]
Yogyakarta		0.248**	0.258**		0.121*	0.122*
		[0.0848]	[0.0862]		[0.0607]	[0.0596]
Jawa Timur		0.164+	0.133		0.0532	0.0474
		[0.0878]	[0.0885]		[0.0726]	[0.0708]
Bali		0.0748	-0.0451		0.186	0.164
		[0.144]	[0.129]		[0.136]	[0.135]
Nusa Tenggara Barat (NTB)		0.0385	0.0566		0.193*	0.196**
		[0.0977]	[0.102]		[0.0767]	[0.0760]
Kalteng		0.540	-0.0467		0.0945	0.0600
		[0.662]	[1.036]		[0.316]	[0.265]
Kalsel		-0.102	-0.238		0.000321	-0.0220
		[0.129]	[0.237]		[0.104]	[0.104]
Sulsel		-0.103	-0.175		0.212*	0.196*
		[0.101]	[0.124]		[0.0895]	[0.0848]
Constant	-0.291***	-0.378***	-0.293***	-0.0359	-0.0912	-0.0737
	[0.0359]	[0.0703]	[0.0823]	[0.0458]	[0.0609]	[0.0605]
Observations	6,901	6,901	6,901	4,406	4,406	4,406
R^2	0.103	0.116	0.054	0.010	0.018	0.017
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Kleibergen–Paap F-stat			33.00			36.04

Note: Standard errors are provided in brackets and clustered within districts. The model uses exports from the ASEAN region to the PRC as the instrument and includes the following countries: Brunei Darussalam, Singapore, Myanmar, Malaysia, the Philippines, and Thailand. Individual-level data cover all adult individuals that exist across the three latest IFLS waves: 2000, 2007, and 2014 (balanced panel). Continuous variables are transformed into standardized variables with mean = 0 and standard deviation = 1. Covariates are used across all estimations. The Stock–Yogo (2005) critical value with 10% maximal bias is 16.38, while the suggested minimum value for F-stat that is robust to heteroscedasticity, serial correlation, and clustering problems (effective F-stat) is 23.1. Significance: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A4.
The Impact of Export Expansion to the PRC on Formal Employment: 2SLS Estimation—Full Results

	(1)	(2)	(3)	(4)	(5)
	Baseline	Employed in 2000	Not Employed in 2000	In Formal Job in 2000	Not in Formal Job in 2000
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	0.384**	0.594**	0.0280	0.252*	0.236+
	[0.148]	[0.193]	[0.0255]	[0.121]	[0.126]
Gender, 1 = male, 0 = female	0.560***	0.385***	0.447***	0.136*	0.239***
	[0.0330]	[0.0342]	[0.0924]	[0.0616]	[0.0245]
Age (years) in 2000 (standardized)	-0.0450**	-0.0670***	-0.0688***	-0.000968	-0.0706***
	[0.0140]	[0.0175]	[0.0126]	[0.0241]	[0.0115]
Father's years of education in 2000 (standardized)	0.0799***	0.0730***	0.0666**	0.0348+	0.0473*
	[0.0129]	[0.0165]	[0.0219]	[0.0185]	[0.0196]
Sufficient ventilation in 2000, 1 = yes, 0 = no	0.111**	0.151***	-0.0115	0.216***	-0.00378
	[0.0358]	[0.0428]	[0.0340]	[0.0577]	[0.0294]
Piles of trash around the house in 2000, 1 = yes, 0 = no	-0.241***	-0.322***	-0.0250	-0.325***	-0.100**
	[0.0462]	[0.0677]	[0.0421]	[0.0798]	[0.0339]
District's tradable employment, cumulative annual growth 1997–2000 (standardized)	0.00141	-0.00643	0.0144	-0.0171	0.00312
	[0.0418]	[0.0506]	[0.0182]	[0.0425]	[0.0209]
Sumatera Barat	0.0910	0.0852	0.0806	-0.0917	0.128
	[0.103]	[0.134]	[0.0664]	[0.193]	[0.0852]
Riau	-0.314	-0.499	-0.0554	-0.785*	0.0795
	[0.230]	[0.324]	[0.0362]	[0.319]	[0.299]
Sumatera Selatan	-0.0455	-0.0293	-0.0711+	0.0400	0.0714
	[0.147]	[0.199]	[0.0413]	[0.175]	[0.0672]
Lampung	-0.263+	-0.335*	-0.112**	-0.394	-0.0515
	[0.152]	[0.165]	[0.0379]	[0.335]	[0.0567]
DKI Jakarta	-0.749	-1.215	0.0328	-0.666+	-0.470
	[0.545]	[0.802]	[0.0878]	[0.402]	[0.484]
Jawa Barat	0.0394	0.0771	0.0228	-0.168	0.107
	[0.0913]	[0.124]	[0.0437]	[0.122]	[0.0847]
Jawa Tengah	0.133	0.0909	0.135*	-0.158	0.185**
	[0.100]	[0.130]	[0.0582]	[0.140]	[0.0719]

Yogyakarta	0.258**	0.229+	0.160*	-0.0445	0.113
	[0.0862]	[0.120]	[0.0634]	[0.141]	[0.0934]
Jawa Timur	0.133	0.114	0.108*	-0.0447	0.0909
	[0.0885]	[0.119]	[0.0485]	[0.138]	[0.0588]
Bali	-0.0451	-0.140	0.0700	-0.00827	0.00931
	[0.129]	[0.167]	[0.0457]	[0.229]	[0.0988]
NTB	0.0566	0.0306	0.0692	-0.134	0.0805
	[0.102]	[0.133]	[0.0699]	[0.152]	[0.0713]
Kalteng	-0.0467	0.149	-0.212*	-0.0849	
	[1.036]	[1.107]	[0.0965]	[0.814]	
Kalsel	-0.238	-0.360	0.0172	-0.0426	-0.0556
	[0.237]	[0.324]	[0.0593]	[0.180]	[0.145]
Sulsel	-0.175	-0.230	0.0308	-0.257	0.0480
	[0.124]	[0.194]	[0.0577]	[0.203]	[0.0782]
Constant	-0.293***	-0.0693	-0.590***	0.708***	-0.573***
	[0.0823]	[0.116]	[0.0407]	[0.131]	[0.0639]
Observations	6,901	5,396	1,463	2,560	2,836
R^2	0.054	-0.038	0.096	0.009	0.010
Kleibergen–Paap F-stat	33.00	35.88	27.76	45.86	21.57
Robust CS (lower bound)	0.021	0.146	-0.029	-0.037	-0.012
Robust CS (upper bound)	0.646	0.951	0.076	0.463	0.534
Nonrobust (Wald) CS (lower bound)	0.093	0.215	-0.022	0.015	-0.011
Nonrobust (Wald) CS (upper bound)	0.675	0.972	0.078	0.49	0.483

Note: Standard errors are provided in brackets and clustered within districts. The model uses exports from the ASEAN region to the PRC as the instrument and includes the following countries: Brunei Darussalam, Singapore, Myanmar, Malaysia, the Philippines, and Thailand. Individual-level data cover all adult individuals that exist across the three latest IFLS waves: 2000, 2007, and 2014 (balanced panel). Continuous variables are transformed into standardized variables with mean = 0 and standard deviation = 1. Covariates are used across all estimations. The Stock–Yogo (2005) critical value with 10% maximal bias is 16.38, while the suggested minimum value for F-stat that is robust to heteroscedasticity, serial correlation, and clustering problems (effective F-stat) is 23.1. Significance: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A5.
The Impact of Export Expansion to the PRC on Earnings Growth: 2SLS Estimation—Full Results

	(1)	(2)	(3)	(4)	(5)
	Baseline	Employed in 2000	Not Employed in 2000	In Formal Job in 2000	Not in Formal Job in 2000
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	0.0746	0.0750	0.145	0.0744	-0.0427
	[0.0513]	[0.0554]	[0.129]	[0.0563]	[0.143]
Gender, 1 = male, 0 = female	-0.00258	-0.0249	-0.202	-0.0816*	0.0193
	[0.0315]	[0.0357]	[0.141]	[0.0385]	[0.0633]
Age (years) in 2000 (standardized)	-0.0845***	-0.0871***	-0.123*	-0.0676**	-0.103***
	[0.0160]	[0.0174]	[0.0522]	[0.0221]	[0.0259]
Father's years of education in 2000 (standardized)	0.0123	0.0222	-0.0404	0.00121	0.0506+
	[0.0136]	[0.0143]	[0.0559]	[0.0155]	[0.0282]
Sufficient ventilation in 2000, 1 = yes, 0 = no	0.0464	0.0622	-0.103	0.0580	0.0605
	[0.0416]	[0.0426]	[0.152]	[0.0500]	[0.0676]
Piles of trash around the house in 2000, 1 = yes, 0 = no	-0.109*	-0.120*	0.0106	-0.122+	-0.0906
	[0.0510]	[0.0513]	[0.176]	[0.0701]	[0.0673]
District's tradable employment, cumulative annual growth 1997–2000 (standardized)	-0.0147	-0.0181	0.0645	-0.0206	-0.0206
	[0.0212]	[0.0245]	[0.0599]	[0.0211]	[0.0406]
Sumatera Barat	0.0942	0.0692	0.125	0.0183	0.0503
	[0.0912]	[0.106]	[0.155]	[0.0935]	[0.168]
Riau	-0.182	-0.260	0.416**	-0.607*	0.272
	[0.217]	[0.250]	[0.156]	[0.246]	[0.413]
Sumatera Selatan	0.306***	0.244***	0.656*	0.218**	0.308*
	[0.0611]	[0.0730]	[0.302]	[0.0837]	[0.141]
Lampung	0.0403	-0.0278	0.317*	-0.195+	0.152
	[0.0958]	[0.105]	[0.136]	[0.113]	[0.140]
DKI Jakarta	-0.120	-0.185	0.0612	-0.305	0.248
	[0.185]	[0.203]	[0.360]	[0.188]	[0.437]
Jawa Barat	0.00940	-0.0423	0.303	-0.208**	0.117
	[0.0681]	[0.0756]	[0.230]	[0.0794]	[0.129]
Jawa Tengah	-0.0594	-0.137	0.471**	-0.249*	-0.0334
	[0.0912]	[0.0998]	[0.176]	[0.111]	[0.134]

Yogyakarta	0.122*	0.0649	0.349*	-0.161+	0.316**
	[0.0596]	[0.0678]	[0.163]	[0.0892]	[0.118]
Jawa Timur	0.0474	-0.0119	0.340+	-0.164*	0.121
	[0.0708]	[0.0772]	[0.182]	[0.0832]	[0.123]
Bali	0.164	0.0832	0.679***	-0.0730	0.291
	[0.135]	[0.151]	[0.179]	[0.146]	[0.203]
NTB	0.196**	0.148+	0.360*	-0.155+	0.455***
	[0.0760]	[0.0894]	[0.162]	[0.0931]	[0.135]
Kalteng	0.0600	0.0118		-0.168	
	[0.265]	[0.260]		[0.258]	
Kalsel	-0.0220	-0.0597	-0.191	-0.118	0.0826
	[0.104]	[0.108]	[0.388]	[0.123]	[0.151]
Sulsel	0.196*	0.160	0.447	0.127	0.247
	[0.0848]	[0.0976]	[0.286]	[0.0987]	[0.153]
Constant	-0.0737	0.00102	-0.384*	0.236**	-0.253*
	[0.0605]	[0.0704]	[0.185]	[0.0835]	[0.115]
Observations	4,406	4,054	337	2,181	1,873
R^2	0.017	0.019	0.054	0.022	0.029
Kleibergen–Paap F-stat	36.04	37.47	25.31	45.82	20.50
Robust CS (lower bound)	-0.024	-0.035	-0.117	-0.025	-0.407
Robust CS (upper bound)	0.186	0.193	0.428	0.203	0.218
Nonrobust (Wald) CS (lower bound)	-0.026	-0.034	-0.109	-0.036	-0.323
Nonrobust (Wald) CS (upper bound)	0.175	0.184	0.399	0.185	0.238

Note: Standard errors are provided in brackets and clustered within districts. The model uses exports from the ASEAN region to the PRC as the instrument and includes the following countries: Brunei Darussalam, Singapore, Myanmar, Malaysia, the Philippines, and Thailand. Individual-level data cover all adult individuals that exist across the three latest IFLS waves: 2000, 2007, and 2014 (balanced panel). Continuous variables are transformed into standardized variables with mean = 0 and standard deviation = 1. Covariates are used across all estimations. The Stock–Yogo (2005) critical value with 10% maximal bias is 16.38, while the suggested minimum value for F-stat that is robust to heteroscedasticity, serial correlation, and clustering problems (effective F-stat) is 23.1. Confidence sets (CS) are based on 1,000 grid points in the interval of [-0.5, 2]. Robust CS are based on the Anderson–Rubin (AR) test and robust to heteroskedasticity and clustering issues. Wald CS are based on 2SLS estimates and are not robust to weak instruments. Significance: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A6.
The Impact of Export Expansion to the PRC on Formal Employment by Decile of Earnings: 2SLS Estimation—Full Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	0.375	0.370+	0.524**	0.729***	0.820**	0.894**	0.870***	0.00964	0.0177	-0.0232
	[0.243]	[0.218]	[0.165]	[0.201]	[0.275]	[0.297]	[0.231]	[0.174]	[0.0911]	[0.102]
Gender, 1 = male, 0 = female	0.299***	0.149+	0.351***	-0.0350	0.302**	0.165	0.122	0.133	0.0243	0.189+
	[0.0610]	[0.0893]	[0.0973]	[0.0724]	[0.0922]	[0.125]	[0.116]	[0.115]	[0.100]	[0.111]
Age (years) in 2000 (standardized)	-0.0648**	-0.111**	-0.104**	-0.115**	-0.129**	-0.157**	-0.129*	-0.138*	-0.109+	0.128*
	[0.0224]	[0.0404]	[0.0345]	[0.0350]	[0.0482]	[0.0504]	[0.0599]	[0.0548]	[0.0642]	[0.0575]
Father's years of education in 2000 (standardized)	0.0355	0.0566	0.109+	0.0979*	0.0602	0.0888+	0.104*	0.154***	-0.0484	0.0610*
	[0.0340]	[0.0583]	[0.0601]	[0.0405]	[0.0589]	[0.0525]	[0.0420]	[0.0456]	[0.0599]	[0.0292]
Sufficient ventilation in 2000, 1 = yes, 0 = no	-0.0118	-0.107	0.239***	-0.0587	-0.0473	0.0768	0.0972	-0.205+	0.166	0.0716
	[0.0529]	[0.0830]	[0.0689]	[0.0816]	[0.114]	[0.131]	[0.119]	[0.124]	[0.136]	[0.162]
Piles of trash around the house in 2000, 1 = yes, 0 = no	-0.0704	-0.285**	-0.246*	-0.00149	-0.254+	-0.118	-0.492*	-0.398**	-0.425*	-0.254
	[0.0535]	[0.107]	[0.111]	[0.110]	[0.136]	[0.157]	[0.221]	[0.128]	[0.199]	[0.250]
District's tradable employment, cumulative annual growth 1997–2000 (standardized)	-0.00245	-0.0894**	-0.0161	-0.0199	0.0881	0.0916	0.121	-0.0701	0.0267	-0.108+
	[0.0281]	[0.0340]	[0.0350]	[0.0394]	[0.113]	[0.0947]	[0.107]	[0.0516]	[0.0542]	[0.0631]

Sumatera Barat	0.241*	-0.190	-0.361	0.0392	0.326	-0.0580	-0.295	0.465+	0.131	0.397
	[0.119]	[0.505]	[0.249]	[0.287]	[0.376]	[0.285]	[0.282]	[0.259]	[0.312]	[0.286]
Sumatera Selatan	0.0476	-0.245	-0.104	0.0918	0.0217	-0.221	-0.267	0.249	-0.245	0.891**
	[0.0727]	[0.477]	[0.274]	[0.280]	[0.385]	[0.221]	[0.458]	[0.295]	[0.402]	[0.290]
Lampung	0.0262	-0.200	-0.390	-0.0156	0.0354	-0.326*	-0.536+	-0.266	-0.667*	0.377
	[0.0751]	[0.495]	[0.268]	[0.288]	[0.295]	[0.161]	[0.311]	[0.362]	[0.312]	[0.329]
DKI Jakarta	-0.353	-1.371	-1.182	-1.684*	-2.299	-1.602*	-2.569*	0.262	0.0870	0.212
	[0.657]	[1.011]	[0.875]	[0.834]	[1.595]	[0.817]	[1.293]	[0.527]	[0.427]	[0.315]
Jawa Barat	0.112	0.0186	-0.134	0.270	0.388	-0.00166	-0.0179	0.371+	0.0929	0.280
	[0.0810]	[0.486]	[0.242]	[0.261]	[0.278]	[0.232]	[0.264]	[0.222]	[0.285]	[0.292]
Jawa Tengah	0.180**	-0.0186	-0.204	0.252	0.278	0.351	-0.00842	0.105	0.371	0.264
	[0.0669]	[0.486]	[0.230]	[0.248]	[0.282]	[0.240]	[0.301]	[0.246]	[0.369]	[0.299]
Yogyakarta	0.0800	0.0267	-0.000168	0.145	0.568*	0.290+	0.181	0.609**	0.557+	0.329
	[0.136]	[0.502]	[0.250]	[0.271]	[0.271]	[0.173]	[0.286]	[0.233]	[0.305]	[0.274]
Jawa Timur	0.0609	0.256	-0.136	0.0859	0.460+	0.265	0.116	0.241	0.326	0.307
	[0.0751]	[0.498]	[0.247]	[0.245]	[0.266]	[0.182]	[0.283]	[0.247]	[0.319]	[0.275]
Bali	0.279**	0.102	-0.600*	-0.0580	0.0412	0.105	-0.877**	0.129	-0.166	0.516*
	[0.107]	[0.493]	[0.263]	[0.327]	[0.405]	[0.320]	[0.281]	[0.370]	[0.454]	[0.260]
NTB	0.0371	-0.0517	-0.00943	-0.142	0.254	-0.0442	-0.0442	0.0346	0.553+	0.769**
	[0.0776]	[0.493]	[0.230]	[0.245]	[0.260]	[0.353]	[0.300]	[0.293]	[0.330]	[0.293]

Kalsel	-0.197	0.673	-0.388	-0.422	-0.0726	-0.875	-0.482	-0.543*	0.283	0.301
	[0.278]	[0.709]	[0.403]	[0.452]	[0.485]	[0.608]	[0.373]	[0.270]	[0.394]	[0.335]
Sulsel	0.0128	-0.148	-0.162	-0.307	-0.362	0.117	-0.914*	-0.500+	0.471	0.375
	[0.177]	[0.502]	[0.304]	[0.362]	[0.337]	[0.353]	[0.396]	[0.274]	[0.416]	[0.301]
Riau			-1.272***	0.962***		-1.619*		0.413+	-0.938**	0.281
			[0.307]	[0.236]		[0.654]		[0.230]	[0.316]	[0.283]
Kalteng							1.708***	-0.661		1.186***
							[0.331]	[0.655]		[0.311]
Constant	-0.544***	-0.0617	-0.217	0.0722	-0.158	0.178	0.507*	0.356	0.495+	0.312
	[0.103]	[0.493]	[0.223]	[0.239]	[0.280]	[0.198]	[0.258]	[0.290]	[0.296]	[0.289]
Observations	777	301	539	636	474	533	645	487	473	533
R^2	-0.041	0.067	-0.024	-0.115	-0.137	-0.101	-0.202	0.133	0.066	0.071
Kleibergen–Paap F-stat	8.828	8.199	52.09	17.48	22.52	18.88	21.70	33.93	73.68	112.8
Robust CS (lower bound)	0.041	-0.14	0.166	0.426	0.393	0.376	0.501	-0.432	-0.167	-0.227
Robust CS (upper bound)	1.544	1.004	0.836	1.372	1.63	1.7	1.539	0.300	0.198	0.178
Nonrobust (Wald) CS (lower bound)	-0.102	-0.058	0.201	0.336	0.281	0.312	0.417	-0.331	-0.161	-0.223
Nonrobust (Wald) CS (upper bound)	0.852	0.798	0.848	1.122	1.359	1.476	1.323	0.350	0.196	0.177

Note: Standard errors are provided in brackets and clustered within districts. The model uses exports from the ASEAN region to the PRC as the instrument and includes the following countries: Brunei Darussalam, Singapore, Myanmar, Malaysia, the Philippines, and Thailand. Individual-level data cover all adult individuals that exist across the three latest IFLS waves: 2000, 2007, and 2014 (balanced panel). Continuous variables are transformed into standardized variables with mean = 0 and standard deviation = 1. Covariates are used across all estimations. The Stock–Yogo (2005) critical value with 10% maximal bias is 16.38, while the suggested minimum value for F-stat that is robust to heteroscedasticity, serial correlation, and clustering problems (effective F-stat) is 23.1. Confidence sets (CS) are based on 1,000 grid points in the interval of [-0.5, 2]. Robust CS are based on the Anderson–Rubin (AR) test and robust to heteroskedasticity and clustering issues. Wald CS are based on 2SLS estimates and are not robust to weak instruments. Significance: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A7.
The Impact of Export Expansion to the PRC on Earnings Growth by Decile of Earnings: 2SLS Estimation—Full Result

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	0.375	0.453+	0.581***	0.444	0.767***	0.404+	0.376*	0.272	0.215**	-0.0243
	[0.360]	[0.254]	[0.173]	[0.270]	[0.217]	[0.245]	[0.151]	[0.198]	[0.0670]	[0.131]
Gender, 1 = male, 0 = female	-0.150	0.156	0.466***	0.314**	0.276**	0.0986	0.129	0.139	-0.196*	0.0532
	[0.123]	[0.125]	[0.112]	[0.0986]	[0.0950]	[0.112]	[0.0912]	[0.0957]	[0.0782]	[0.111]
Age (years) in 2000 (standardized)	-0.122	-0.138*	-0.115**	-0.0706	-0.112**	-0.116**	-0.0929*	-0.0259	-0.0462	0.154*
	[0.0743]	[0.0644]	[0.0432]	[0.0493]	[0.0414]	[0.0447]	[0.0405]	[0.0353]	[0.0401]	[0.0647]
Father's years of education in 2000 (standardized)	0.0229	0.181+	0.0601	0.116**	-0.00823	0.0230	0.0341	0.0806*	-0.0440	0.0586
	[0.0425]	[0.101]	[0.0641]	[0.0442]	[0.0438]	[0.0302]	[0.0354]	[0.0361]	[0.0509]	[0.0387]
Sufficient ventilation in 2000, 1 = yes, 0 = no	-0.00233	0.238	0.384***	-0.000223	0.231*	0.125	0.206	0.194*	0.0941	0.121
	[0.137]	[0.145]	[0.0994]	[0.118]	[0.109]	[0.124]	[0.132]	[0.0965]	[0.113]	[0.131]
Piles of trash around the house in 2000, 1 = yes, 0 = no	-0.265	-0.240	-0.0198	0.0971	-0.111	-0.359*	-0.171	-0.450*	-0.0517	-0.373
	[0.191]	[0.215]	[0.101]	[0.119]	[0.138]	[0.160]	[0.124]	[0.180]	[0.144]	[0.280]
District's tradable employment, cumulative annual growth 1997–2000 (standardized)	-0.0805+	-0.0533	-0.0822**	-0.00288	0.0313	-0.0413	0.0337	0.0635	-0.0110	-0.00799
	[0.0460]	[0.0449]	[0.0270]	[0.0340]	[0.0656]	[0.0377]	[0.0532]	[0.0582]	[0.0307]	[0.0674]

Sumatera Barat	-0.136	-1.026***	-0.167	-0.0721	-0.00646	0.130	-0.486***	-0.0558	0.245	0.129
	[0.250]	[0.254]	[0.316]	[0.426]	[0.271]	[0.143]	[0.135]	[0.185]	[0.231]	[0.272]
Sumatera Selatan	0.103	-0.822***	0.0874	0.162	0.485**	-0.0987	-0.373**	-0.0225	-0.103	0.548*
	[0.274]	[0.202]	[0.300]	[0.136]	[0.174]	[0.153]	[0.141]	[0.231]	[0.313]	[0.238]
Lampung	-0.564	-1.028***	-0.889**	0.0648	0.121	-0.104	-0.366*	-0.100	-0.153	-0.0498
	[0.474]	[0.271]	[0.292]	[0.172]	[0.274]	[0.125]	[0.163]	[0.226]	[0.220]	[0.225]
DKI Jakarta	-1.312	-1.154	-1.271	-0.441	-1.997	-1.185	-1.362+	-0.736	-0.202	0.211
	[0.950]	[0.721]	[0.786]	[0.707]	[1.359]	[0.769]	[0.732]	[0.658]	[0.330]	[0.385]
Jawa Barat	0.201	-0.786***	-0.789**	-0.200	0.0210	-0.166	-0.437***	-0.0628	0.0710	0.219
	[0.268]	[0.203]	[0.302]	[0.154]	[0.177]	[0.150]	[0.126]	[0.155]	[0.179]	[0.241]
Jawa Tengah	-0.202	-0.988***	-0.910***	-0.293+	-0.142	-0.169	-0.466***	-0.370+	0.279	-0.229
	[0.255]	[0.163]	[0.274]	[0.164]	[0.201]	[0.152]	[0.119]	[0.191]	[0.247]	[0.328]
Yogyakarta	0.132	-0.911***	-0.379	-0.161	0.162	-0.141	-0.244*	0.224	0.251	0.169
	[0.244]	[0.203]	[0.287]	[0.203]	[0.159]	[0.137]	[0.123]	[0.182]	[0.207]	[0.241]
Jawa Timur	0.289	-0.331	-0.437	-0.304+	0.0862	-0.206	-0.441***	-0.146	0.106	-0.0229
	[0.268]	[0.289]	[0.269]	[0.181]	[0.146]	[0.167]	[0.128]	[0.168]	[0.192]	[0.274]
Bali	0.169	-0.669**	-0.442	-0.150	-0.417*	-0.174	-0.469*	-0.433*	0.110	0.472+
	[0.355]	[0.234]	[0.303]	[0.206]	[0.176]	[0.359]	[0.190]	[0.213]	[0.202]	[0.264]
NTB	0.381	-0.390***	-0.385	-0.155	0.292+	-0.163	-0.653*	-0.0421	0.253	0.338
	[0.248]	[0.117]	[0.261]	[0.277]	[0.161]	[0.140]	[0.256]	[0.250]	[0.194]	[0.236]

Kalsel	-0.117	-0.662+	-0.900*	-0.144	-0.273	-0.387	-0.341+	-0.304	0.210	0.222
	[0.384]	[0.355]	[0.456]	[0.280]	[0.375]	[0.430]	[0.187]	[0.212]	[0.208]	[0.277]
Sulsel	0.297	-1.127***	-0.461+	-0.369	-0.298	-0.402	-0.000502	-0.158	0.507*	-0.104
	[0.308]	[0.302]	[0.269]	[0.267]	[0.237]	[0.348]	[0.269]	[0.291]	[0.203]	[0.305]
Riau			-0.672*			-0.285		0.208	-0.175	-0.0288
			[0.327]			[0.234]		[0.164]	[0.313]	[0.237]
Kalteng							-0.0732			1.119**
							[0.210]			[0.384]
Constant	-0.0120	2.165***	0.685**	0.306+	-0.233	-0.000619	-0.0793	-0.315+	-0.266	-0.663**
	[0.266]	[0.233]	[0.263]	[0.185]	[0.161]	[0.199]	[0.163]	[0.169]	[0.185]	[0.250]
Observations	240	206	395	498	391	458	554	418	425	469
R^2	0.056	0.122	0.143	0.065	-0.140	-0.018	-0.045	0.070	0.047	0.089
Kleibergen–Paap F-stat	5.612	14.95	30.71	23.26	27.07	19.74	22.93	32.56	83.52	79.50
Robust CS (lower bound)	-0.213	-0.067	0.208	-0.072	0.406	-0.03	0.106	-0.235	0.066	-0.277
Robust CS (upper bound)	2.618	1.067	0.929	1.084	1.342	1.052	0.759	0.604	0.333	0.248
Nonrobust (Wald) CS (lower bound)	-0.33	-0.044	0.241	-0.086	0.343	-0.076	0.08	-0.116	0.083	-0.282
Nonrobust (Wald) CS (upper bound)	1.08	0.95	0.92	0.973	1.192	0.884	0.672	0.659	0.346	0.233

Note: Standard errors are provided in brackets and clustered within districts. The model uses exports from the ASEAN region to the PRC as the instrument and includes the following countries: Brunei Darussalam, Singapore, Myanmar, Malaysia, the Philippines, and Thailand. Individual-level data cover all adult individuals that exist across the three latest IFLS waves: 2000, 2007, and 2014 (balanced panel). Continuous variables are transformed into standardized variables with mean = 0 and standard deviation = 1. Covariates are used across all estimations. The Stock–Yogo (2005) critical value with 10% maximal bias is 16.38, while the suggested minimum value for F-stat that is robust to heteroscedasticity, serial correlation, and clustering problems (effective F-stat) is 23.1. Confidence sets (CS) are based on 1,000 grid points in the interval of [-0.5, 2]. Robust CS are based on the Anderson–Rubin (AR) test and robust to heteroskedasticity and clustering issues. Wald CS are based on 2SLS estimates and are not robust to weak instruments. Significance: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A8.
The Heterogeneous Impact of Export Expansion to the PRC on Formal Employment: 2SLS Estimation—Full Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Baseline	Female	Male	Agriculture and Mining	Manufac-turing	Services	Low level	Medium level	High level	Non-Java Islands	Java Island
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	0.384**	0.220	0.608***	1.595+	0.509*	0.252**	0.461**	0.217	-0.154+	0.589*	0.333*
	[0.148]	[0.134]	[0.166]	[0.850]	[0.218]	[0.0808]	[0.146]	[0.151]	[0.0842]	[0.291]	[0.147]
Gender, 1 = male, 0 = female	0.560***			0.236***	0.676***	0.436***	0.341***	0.755***	0.0700	0.568***	0.553***
	[0.0330]			[0.0552]	[0.0871]	[0.0448]	[0.0385]	[0.0503]	[0.0962]	[0.0511]	[0.0438]
Age (years) in 2000 (standardized)	-0.0450**	-0.0316*	-0.0670**	-0.00209	-0.114**	-0.0442*	-0.0442**	0.00254	0.184***	0.00504	-0.0809***
	[0.0140]	[0.0159]	[0.0213]	[0.0315]	[0.0348]	[0.0225]	[0.0158]	[0.0234]	[0.0477]	[0.0242]	[0.0156]
Father's years of education in 2000 (standardized)	0.0799***	0.123***	0.0277	0.0690	0.00437	0.0672**	0.00327	0.0615***	0.00803	0.120***	0.0530***
	[0.0129]	[0.0169]	[0.0220]	[0.0452]	[0.0296]	[0.0211]	[0.0256]	[0.0169]	[0.0272]	[0.0228]	[0.0157]
Sufficient ventilation in 2000, 1 = yes, 0 = no	0.111**	0.0446	0.192***	0.0886	0.0470	0.119*	-0.0339	0.0494	0.131	0.0861	0.117*
	[0.0358]	[0.0361]	[0.0485]	[0.0618]	[0.0893]	[0.0563]	[0.0386]	[0.0497]	[0.170]	[0.0524]	[0.0482]
Piles of trash around the house in 2000, 1 = yes, 0 = no	-0.241***	-0.103*	-0.412***	-0.161*	-0.0103	-0.428***	-0.0996*	-0.264***	0.234	-0.217***	-0.230***
	[0.0462]	[0.0446]	[0.0747]	[0.0664]	[0.155]	[0.0702]	[0.0498]	[0.0708]	[0.215]	[0.0588]	[0.0680]
District's tradable employment, cumulative annual growth 1997–2000 (standardized)	0.00141	0.0142	-0.0123	-0.0396	0.103	-0.00788	0.0787	0.0260	-0.0212	0.0882*	-0.0320
	[0.0418]	[0.0441]	[0.0477]	[0.0713]	[0.0718]	[0.0296]	[0.0518]	[0.0326]	[0.0376]	[0.0414]	[0.0419]

Sumatera Barat	0.0910	0.0532	0.128	0.0947	-0.331	0.0753	-0.0671	0.143	0.294	0.0550	
	[0.103]	[0.110]	[0.133]	[0.315]	[0.256]	[0.187]	[0.154]	[0.100]	[0.303]	[0.120]	
Riau	-0.314	-0.317	-0.327	0.674	-0.221	-1.002***	-0.496***	-0.00168	-1.231***	-0.484	
	[0.230]	[0.270]	[0.302]	[0.551]	[0.213]	[0.196]	[0.150]	[0.313]	[0.270]	[0.312]	
Sumatera Selatan	-0.0455	-0.154+	0.0922	0.0940	-0.326	0.0634	-0.241	0.0774	0.0784	-0.0876	
	[0.147]	[0.0918]	[0.269]	[0.322]	[0.252]	[0.221]	[0.180]	[0.151]	[0.342]	[0.151]	
Lampung	-0.263+	-0.145	-0.369*	-0.163	-0.329	-0.281	-0.275	-0.109	0.319	-0.228+	
	[0.152]	[0.151]	[0.172]	[0.312]	[0.268]	[0.259]	[0.172]	[0.254]	[0.385]	[0.135]	
DKI Jakarta	-0.749	-0.488	-1.093	-8.435+	-1.062	-0.543	-1.352+	-0.110	0.159		
	[0.545]	[0.437]	[0.697]	[4.816]	[0.781]	[0.350]	[0.702]	[0.421]	[0.334]		
Jawa Barat	0.0394	-0.0108	0.104	-0.123	0.203	-0.0558	-0.141	0.273**	0.249		0.660
	[0.0913]	[0.0903]	[0.123]	[0.285]	[0.208]	[0.165]	[0.159]	[0.0849]	[0.255]		[0.500]
Jawa Tengah	0.133	0.159	0.103	0.00289	0.0603	-0.00662	0.0250	0.213*	0.405		0.754
	[0.100]	[0.105]	[0.142]	[0.301]	[0.227]	[0.169]	[0.172]	[0.0960]	[0.282]		[0.509]
Yogyakarta	0.258**	0.225*	0.331*	-0.127	-0.0356	0.192	-0.0710	0.272*	0.345		0.881+
	[0.0862]	[0.0880]	[0.134]	[0.297]	[0.254]	[0.168]	[0.162]	[0.125]	[0.270]		[0.515]
Jawa Timur	0.133	0.181+	0.0857	0.0668	0.143	-0.0101	0.139	0.129	0.312		0.765
	[0.0885]	[0.103]	[0.122]	[0.291]	[0.226]	[0.165]	[0.162]	[0.0970]	[0.269]		[0.501]
Bali	-0.0451	-0.0185	-0.0591	-0.453	-0.357	-0.0304	-0.335*	0.263	0.412	-0.112	
	[0.129]	[0.113]	[0.179]	[0.434]	[0.271]	[0.198]	[0.167]	[0.208]	[0.301]	[0.165]	

NTB	0.0566	-0.00302	0.136	-0.225	-0.287	0.00317	-0.271	0.274*	0.697*	0.0965	
	[0.102]	[0.0890]	[0.152]	[0.364]	[0.233]	[0.164]	[0.165]	[0.117]	[0.278]	[0.105]	
Kalteng	-0.0467	-1.213*	0.223		0.482	-1.944***	-2.235***	1.218***		-0.440	
	[1.036]	[0.483]	[1.147]		[0.363]	[0.320]	[0.539]	[0.186]		[1.346]	
Kalsel	-0.238	-0.262	-0.171	-0.968	-0.250	0.0670	-0.559	0.0738	0.464	-0.321	
	[0.237]	[0.181]	[0.306]	[0.976]	[0.339]	[0.237]	[0.368]	[0.162]	[0.311]	[0.350]	
Sulsel	-0.175	-0.175	-0.235	-0.0646	-0.466+	-0.180	-0.309+	-0.00761	0.261	-0.221	
	[0.124]	[0.112]	[0.203]	[0.336]	[0.258]	[0.198]	[0.186]	[0.115]	[0.371]	[0.156]	
Constant	-0.293***	-0.268**	0.236*	0.121	0.150	0.0549	-0.159	-0.389***	0.520*	-0.214+	-0.927+
	[0.0823]	[0.0825]	[0.111]	[0.360]	[0.214]	[0.160]	[0.153]	[0.0838]	[0.228]	[0.129]	[0.484]
Observations	6,901	3,785	3,116	1,686	848	2,861	3,005	2,813	594	2,866	4,035
R^2	0.054	0.008	-0.052	-1.196	0.089	0.050	-0.053	0.139	0.094	0.021	0.041
Kleibergen–Paap F-stat	33.00	37.18	29.73	3.806	46.54	35.93	19.22	37.50	101.3	5.176	81.61
Robust CS (lower bound)	0.0211	-0.105	0.213	0.631	0.016	0.076	0.213	-0.167	-0.317	0.258	0.001
Robust CS (upper bound)	0.646	0.453	0.914	...	0.906	0.408	0.871	0.469	0.018	...	0.594
Nonrobust (Wald) CS (lower bound)	0.093	-0.043	0.282	-0.071	0.083	0.094	0.175	-0.079	-0.32	0.019	0.045
Nonrobust (Wald) CS (upper bound)	0.675	0.482	0.934	3.261	0.936	0.411	0.748	0.512	0.011	1.16	0.621

Note: Standard errors are provided in brackets and clustered within districts. The model uses exports from the ASEAN region to the PRC as the instrument and includes the following countries: Brunei Darussalam, Singapore, Myanmar, Malaysia, the Philippines, and Thailand. Individual-level data cover all adult individuals that exist across the three latest IFLS waves: 2000, 2007, and 2014 (balanced panel). Continuous variables are transformed into standardized variables with mean = 0 and standard deviation = 1. Covariates are used across all estimations. The Stock–Yogo (2005) critical value with 10% maximal bias is 16.38, while the suggested minimum value for F-stat that is robust to heteroscedasticity, serial correlation, and clustering problems (effective F-stat) is 23.1. Confidence sets (CS) are based on 1,000 grid points in the interval of [-0.5, 2]. Robust CS are based on the Anderson–Rubin (AR) test and robust to heteroskedasticity and clustering issues. Wald CS are based on 2SLS estimates and are not robust to weak instruments. Significance: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A9.
The Heterogeneous Impact of Export Expansion to the PRC on Earnings Growth: 2SLS Estimation—Full Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Baseline	Female	Male	Agriculture and Mining	Manufac-turing	Services	Low level	Medium level	High level	Non-Java Islands	Java Island
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	0.0746	-0.0105	0.114*	-0.129	0.0493	0.104*	-0.120	-0.00138	0.0474	-0.0693	0.123*
	[0.0513]	[0.0886]	[0.0507]	[0.465]	[0.160]	[0.0468]	[0.185]	[0.0485]	[0.0935]	[0.121]	[0.0512]
Gender, 1 = male, 0 = female	-0.00258			-0.0262	0.0907	-0.0612	0.0304	-0.0480	0.00765	-0.00756	-0.00133
	[0.0315]			[0.0940]	[0.0867]	[0.0400]	[0.0538]	[0.0473]	[0.0828]	[0.0506]	[0.0407]
Age (years) in 2000 (standardized)	-0.0845***	-0.102***	-0.0737***	-0.0767*	-0.133**	-0.0953***	-0.0971***	-0.0524*	-0.0840+	-0.0768**	-0.0932***
	[0.0160]	[0.0269]	[0.0192]	[0.0329]	[0.0460]	[0.0230]	[0.0240]	[0.0244]	[0.0431]	[0.0253]	[0.0207]
Father's years of education in 2000 (standardized)	0.0123	-0.00336	0.0232	0.0188	-0.0179	0.0338+	-0.0650	0.00869	0.000848	0.0241	0.00174
	[0.0136]	[0.0227]	[0.0164]	[0.0473]	[0.0377]	[0.0189]	[0.0513]	[0.0185]	[0.0291]	[0.0217]	[0.0178]
Sufficient ventilation in 2000, 1 = yes, 0 = no	0.0464	0.0592	0.0485	0.0345	0.172	0.0322	0.0763	-0.0180	-0.0613	0.157*	-0.0151
	[0.0416]	[0.0676]	[0.0461]	[0.0905]	[0.110]	[0.0484]	[0.0599]	[0.0610]	[0.227]	[0.0675]	[0.0503]
Piles of trash around the house in 2000, 1 = yes, 0 = no	-0.109*	0.0397	-0.189**	-0.128+	-0.361**	-0.0711	-0.0760	-0.123	-0.0596	-0.125+	-0.110
	[0.0510]	[0.0799]	[0.0613]	[0.0746]	[0.134]	[0.0751]	[0.0702]	[0.0862]	[0.132]	[0.0678]	[0.0767]
District's tradable employment, cumulative annual growth 1997–2000 (standardized)	-0.0147	-0.0611+	0.00722	0.00220	0.0799	-0.0543+	-0.0580	-0.0276	-0.0559	-0.0425	-0.00315
	[0.0212]	[0.0349]	[0.0268]	[0.0375]	[0.0536]	[0.0280]	[0.0486]	[0.0230]	[0.0364]	[0.0268]	[0.0264]

Sumatera Barat	0.0942	0.165	0.0464	-0.0477	-0.364+	0.214*	-0.0799	0.174	0.504+	0.117	
	[0.0912]	[0.156]	[0.111]	[0.176]	[0.192]	[0.107]	[0.117]	[0.172]	[0.302]	[0.108]	
Riau	-0.182	0.486	-0.413*	-0.462	-0.809***	0.104	-0.563	0.0851		-0.100	
	[0.217]	[0.365]	[0.167]	[0.392]	[0.148]	[0.240]	[0.349]	[0.272]		[0.240]	
Sumatera Selatan	0.306***	0.336+	0.288**	0.0879	0.289	0.382**	0.194	0.443**	0.321	0.320***	
	[0.0611]	[0.188]	[0.102]	[0.138]	[0.192]	[0.121]	[0.131]	[0.166]	[0.399]	[0.0677]	
Lampung	0.0403	-0.184	0.118	0.0222	0.204	-0.128	-0.168	0.298*	-0.0539	0.0307	
	[0.0958]	[0.173]	[0.102]	[0.154]	[0.400]	[0.150]	[0.121]	[0.138]	[0.377]	[0.0893]	
DKI Jakarta	-0.120	0.0298	-0.191	0.712	-0.251	-0.212	0.282	0.167	-0.0837		
	[0.185]	[0.246]	[0.214]	[2.424]	[0.433]	[0.200]	[0.561]	[0.143]	[0.267]		
Jawa Barat	0.00940	0.0670	-0.0223	-0.145	-0.0463	0.0139	-0.192	0.197*	0.152		0.249
	[0.0681]	[0.110]	[0.0844]	[0.146]	[0.129]	[0.0922]	[0.141]	[0.0838]	[0.232]		[0.205]
Jawa Tengah	-0.0594	-0.0546	-0.0608	-0.0595	-0.270	-0.114	-0.212	-0.0141	0.342		0.185
	[0.0912]	[0.120]	[0.0958]	[0.142]	[0.206]	[0.0940]	[0.134]	[0.116]	[0.236]		[0.237]
Yogyakarta	0.122*	0.0545	0.163*	0.234+	-0.132	0.0896	0.0564	0.145+	0.153		0.373+
	[0.0596]	[0.106]	[0.0748]	[0.139]	[0.226]	[0.0875]	[0.120]	[0.0831]	[0.235]		[0.217]
Jawa Timur	0.0474	0.139	-0.0142	0.0211	-0.143	0.0240	-0.0701	0.141	0.144		0.294
	[0.0708]	[0.106]	[0.0805]	[0.148]	[0.153]	[0.0753]	[0.132]	[0.0921]	[0.225]		[0.211]
Bali	0.164	0.314+	0.0619	0.148	-0.125	0.0983	-0.0616	0.413**	0.318	0.208	
	[0.135]	[0.179]	[0.143]	[0.233]	[0.259]	[0.140]	[0.184]	[0.142]	[0.229]	[0.155]	

NTB	0.196**	0.252**	0.166+	0.196	0.450+	0.0878	0.112	0.391***	-0.0678	0.186*	
	[0.0760]	[0.0798]	[0.0982]	[0.192]	[0.239]	[0.0998]	[0.135]	[0.0885]	[0.276]	[0.0801]	
Kalteng	0.0600		0.0747		0.168			0.184		0.208	
	[0.265]		[0.209]		[0.236]			[0.343]		[0.356]	
Kalsel	-0.0220	-0.0592	-0.0133	0.0134	-0.174	-0.0534	-0.171	0.202	0.123	0.0270	
	[0.104]	[0.188]	[0.109]	[0.246]	[0.255]	[0.141]	[0.203]	[0.132]	[0.295]	[0.131]	
Sulsel	0.196*	0.169	0.208*	0.182	0.143	0.161+	0.0724	0.351**	0.270	0.226*	
	[0.0848]	[0.107]	[0.103]	[0.173]	[0.356]	[0.0881]	[0.148]	[0.126]	[0.254]	[0.101]	
Constant	-0.0737	-0.143	-0.0421	-0.0451	-0.150	0.0363	-0.114	-0.0986	0.177	-0.202*	-0.261
	[0.0605]	[0.0899]	[0.0791]	[0.205]	[0.147]	[0.0781]	[0.122]	[0.0960]	[0.304]	[0.0799]	[0.209]
Observations	4,406	1,624	2,782	1,099	648	2,304	1,853	1,839	471	1,773	2,633
R^2	0.017	0.024	0.018	0.011	0.062	0.021	0.020	0.024	0.036	0.020	0.002
Kleibergen–Paap F-stat	36.04	40.53	33.60	4.330	41.57	39.99	19.09	38.40	85.18	5.521	79.25
Robust CS (lower bound)	-0.024	-0.207	0.026	...	-.252252	0.003	...	-0.105	-0.125	...	0.021
Robust CS (upper bound)	0.186	0.156	0.238	0.856	.405906	0.193	0.218	0.093	0.248	0.098	0.223
Nonrobust (Wald) CS (lower bound)	-0.026	-0.184	0.015	-1.042	-.265144	0.012	-0.483	-0.096	-0.136	-0.307	0.022
Nonrobust (Wald) CS (upper bound)	0.175	0.163	0.213	0.783	.363683	0.196	0.242	0.094	0.231	0.168	0.223

Note: Standard errors are provided in brackets and clustered within districts. The model uses exports from the ASEAN region to the PRC as the instrument and includes the following countries: Brunei Darussalam, Singapore, Myanmar, Malaysia, the Philippines, and Thailand. Individual-level data cover all adult individuals that exist across the three latest IFLS waves: 2000, 2007, and 2014 (balanced panel). Continuous variables are transformed into standardized variables with mean = 0 and standard deviation = 1. Covariates are used across all estimations. The Stock–Yogo (2005) critical value with 10% maximal bias is 16.38, while the suggested minimum value for F-stat that is robust to heteroscedasticity, serial correlation, and clustering problems (effective F-stat) is 23.1. Confidence sets (CS) are based on 1,000 grid points in the interval of [-0.5, 2]. Robust CS are based on the Anderson–Rubin (AR) test and robust to heteroskedasticity and clustering issues. Wald CS are based on 2SLS estimates and are not robust to weak instruments. Significance: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A10.
Impact of Export Expansion to the PRC on Formality and Earnings Growth: 2SLS Estimation—Full Results, Matched Datasets

	(1)	(2)	(3)	(4)
	Formality, All	Formality, Matched	Earnings, All	Earnings, Matched
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	0.384**	0.222*	0.0746	0.185***
	[0.148]	[0.106]	[0.0513]	[0.0503]
Gender, 1 = male, 0 = female	0.560***	0.366***	-0.00258	-0.00186
	[0.0330]	[0.0586]	[0.0315]	[0.0462]
Age (years) in 2000 (standardized)	-0.0450**	-0.0544*	-0.0845***	-0.0705**
	[0.0140]	[0.0264]	[0.0160]	[0.0239]
Father's years of education in 2000 (standardized)	0.0799***	0.0596**	0.0123	0.0183
	[0.0129]	[0.0208]	[0.0136]	[0.0186]
Sufficient ventilation in 2000, 1 = yes, 0 = no	0.111**	0.178**	0.0464	-0.00510
	[0.0358]	[0.0587]	[0.0416]	[0.0604]
Piles of trash around the house in 2000, 1 = yes, 0 = no	-0.241***	-0.441***	-0.109*	-0.189
	[0.0462]	[0.106]	[0.0510]	[0.117]
District's tradable employment, cumulative annual growth 1997–2000 (standardized)	0.00141	-0.00410	-0.0147	-0.0570
	[0.0418]	[0.0431]	[0.0212]	[0.0460]
Sumatera Barat	0.0910	0.0740	0.0942	0.267***
	[0.103]	[0.153]	[0.0912]	[0.0761]
Riau	-0.314	-0.819***	-0.182	-0.0196
	[0.230]	[0.217]	[0.217]	[0.246]
Sumatera Selatan	-0.0455	0.0344	0.306***	0.315**
	[0.147]	[0.207]	[0.0611]	[0.119]
Lampung	-0.263+	-0.102	0.0403	-0.0501
	[0.152]	[0.262]	[0.0958]	[0.101]
DKI Jakarta	-0.749	-0.456	-0.120	-0.349
	[0.545]	[0.386]	[0.185]	[0.281]
Jawa Barat	0.0394	0.198	0.00940	-0.0204
	[0.0913]	[0.124]	[0.0681]	[0.0925]
Jawa Tengah	0.133	0.0223	-0.0594	-0.0850
	[0.100]	[0.146]	[0.0912]	[0.114]

Yogyakarta	0.258**	0.298*	0.122*	0.111
	[0.0862]	[0.148]	[0.0596]	[0.0821]
Jawa Timur	0.133	0.207	0.0474	-0.0246
	[0.0885]	[0.137]	[0.0708]	[0.0889]
Bali	-0.0451	-0.0487	0.164	0.111
	[0.129]	[0.220]	[0.135]	[0.148]
NTB	0.0566	0.539***	0.196**	0.184+
	[0.102]	[0.154]	[0.0760]	[0.0944]
Kalteng	-0.0467	0.466	0.0600	0.0559
	[1.036]	[0.779]	[0.265]	[0.181]
Kalsel	-0.238	-0.262	-0.0220	-0.0475
	[0.237]	[0.288]	[0.104]	[0.176]
Sulsel	-0.175	-0.109	0.196*	0.0150
	[0.124]	[0.162]	[0.0848]	[0.129]
Constant	-0.293***	0.0509	-0.0737	-0.0311
	[0.0823]	[0.123]	[0.0605]	[0.0719]
Observations	6,901	2,192	4,406	1,813
R^2	0.054	0.023	0.017	-0.000
Kleibergen–Paap F-stat	33.00	44.23	36.04	46.16
Robust CS (lower bound)	0.021	-0.02	-0.025	0.076
Robust CS (upper bound)	0.646	0.413	0.186	0.278
Nonrobust (Wald) CS (lower bound)	0.093	0.015	-0.026	0.087
Nonrobust (Wald) CS (upper bound)	0.675	0.429	0.175	0.284

Note: Columns (1) and (3) cover all samples, while Columns (2) and (4) only include matched individuals across the control and treatment groups. Individuals living in a region where export expansion is larger than the 75th percentile are considered to be in the treated group. Standard errors are provided in brackets and clustered within districts. The model uses exports from the ASEAN region to the PRC as the instrument and includes the following countries: Brunei Darussalam, Singapore, Myanmar, Malaysia, the Philippines, and Thailand. Individual-level data cover all adult individuals that exist across the three latest IFLS waves: 2000, 2007, and 2014 (balanced panel). Continuous variables are transformed into standardized variables with mean = 0 and standard deviation = 1. Covariates are used across all estimations. The Stock–Yogo (2005) critical value with 10% maximal bias is 16.38, while the suggested minimum value for F-stat that is robust to heteroscedasticity, serial correlation, and clustering problems (effective F-stat) is 23.1. Confidence sets (CS) are based on 1,000 grid points in the interval of [-0.5, 2]. Robust CS are based on the Anderson–Rubin (AR) test and robust to heteroskedasticity and clustering issues. Wald CS are based on 2SLS estimates and are not robust to weak instruments. Significance: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A11.
The Impact of Export Expansion to the PRC on Formal Employment by Decile of Earnings: 2SLS Estimation—Full Results, Matched Datasets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	0.382***	0.687***	0.676+	1.134**	0.721**	0.0780	-0.434***	-0.252*	-0.248	-0.156
	[0.111]	[0.160]	[0.388]	[0.425]	[0.244]	[0.152]	[0.125]	[0.111]	[0.192]	[0.151]
Gender, 1 = male, 0 = female	0.642***	0.0632	0.515**	0.235	0.0899	0.392*	0.0894	0.339	-0.121	0.390*
	[0.126]	[0.130]	[0.163]	[0.180]	[0.148]	[0.195]	[0.130]	[0.216]	[0.106]	[0.157]
Age (years) in 2000 (standardized)	-0.0925	-0.0236	-0.160*	-0.145	-0.133+	-0.201*	-0.184*	-0.0424	0.212**	0.162+
	[0.0628]	[0.0772]	[0.0730]	[0.0882]	[0.0769]	[0.0860]	[0.0858]	[0.117]	[0.0807]	[0.0890]
Father's years of education in 2000 (standardized)	0.134	0.154**	0.107	0.0742	0.149**	0.207***	-0.0324	-0.148	0.0242	0.0824
	[0.0827]	[0.0587]	[0.0752]	[0.0788]	[0.0549]	[0.0592]	[0.0597]	[0.0970]	[0.0472]	[0.0692]
Sufficient ventilation in 2000, 1 = yes, 0 = no	0.0275	0.299+	-0.0732	0.0722	-0.0269	-0.469*	-0.366*	0.620*	0.208	0.131
	[0.103]	[0.179]	[0.170]	[0.185]	[0.147]	[0.187]	[0.163]	[0.294]	[0.279]	[0.195]
Piles of trash around the house in 2000, 1 = yes, 0 = no	-0.653***	0.190	-0.152	-0.0949	-0.834*	-0.125	-0.0957	0.643	0.557+	-0.717+
	[0.168]	[0.178]	[0.301]	[0.448]	[0.369]	[0.391]	[0.257]	[0.426]	[0.292]	[0.428]
District's tradable employment, cumulative annual growth 1997–2000 (standardized)	-0.0308	0.144	0.130	0.116	0.301	-0.151	-0.134*	-0.238*	-0.00821	-0.100
	[0.0461]	[0.0993]	[0.201]	[0.114]	[0.185]	[0.0921]	[0.0629]	[0.0991]	[0.0612]	[0.0937]
Sumatera Barat	-0.902	-0.997**	0.605*	-0.0902	0.294	-0.315	0.147	1.209**	0.0290	0.689
	[0.558]	[0.360]	[0.275]	[0.562]	[0.301]	[0.398]	[0.303]	[0.447]	[0.316]	[0.460]

Riau	-1.420*			-1.993*			-0.0218	-1.069**		
	[0.578]			[0.853]			[0.486]	[0.362]		
Sumatera Selatan	-0.464	-0.447	0.191	-0.563	-0.296	-0.918*	0.0747	0.191	0.491	0.980**
	[0.543]	[0.385]	[0.310]	[0.375]	[0.309]	[0.395]	[0.355]	[0.731]	[0.320]	[0.315]
Lampung	-0.507	-0.736*	0.819+	-0.339	-0.180	-0.935+	0.366	-0.593	0.822*	0.342
	[0.604]	[0.363]	[0.452]	[0.243]	[0.269]	[0.525]	[0.424]	[0.566]	[0.327]	[0.382]
DKI Jakarta	-1.419+	-2.419**	-1.323	-2.059*	-1.827	-0.813*	1.581**	0.843*	0.550	0.580
	[0.772]	[0.836]	[1.596]	[0.991]	[1.120]	[0.408]	[0.601]	[0.414]	[0.575]	[0.425]
Jawa Barat	-0.525	-0.555	0.971**	0.0995	0.377+	-0.784*	0.397	0.616+	0.266	0.710*
	[0.550]	[0.384]	[0.347]	[0.412]	[0.218]	[0.381]	[0.268]	[0.344]	[0.333]	[0.306]
Jawa Tengah	-0.632	-0.729*	0.743**	0.0455	0.212	-0.600	0.438	0.867*	-0.0197	0.369
	[0.570]	[0.363]	[0.283]	[0.311]	[0.232]	[0.438]	[0.339]	[0.433]	[0.441]	[0.353]
Yogyakarta	-0.367	-0.477	0.935**	0.0874	0.558*	-1.366**	1.130***	0.465	-0.0227	0.441
	[0.555]	[0.414]	[0.344]	[0.275]	[0.229]	[0.485]	[0.320]	[0.456]	[0.385]	[0.299]
Jawa Timur	-0.726	-1.075**	0.645*	0.0576	0.436+	-0.473	0.592*	0.730+	0.205	0.680*
	[0.565]	[0.376]	[0.288]	[0.257]	[0.253]	[0.410]	[0.290]	[0.389]	[0.320]	[0.291]
Bali	-0.926	-1.447***	0.273	-0.646	-0.497+	-0.361	0.508	0.454	0.329	1.033**
	[0.576]	[0.430]	[0.421]	[0.527]	[0.277]	[0.487]	[0.468]	[0.537]	[0.337]	[0.398]
NTB	-0.334	-1.007**	0.823*	0.436	0.791***	0.663	0.518	0.229	0.586+	1.044**
	[0.578]	[0.369]	[0.325]	[0.428]	[0.201]	[0.413]	[0.325]	[0.553]	[0.306]	[0.400]

Kalsel	-1.100+	-2.228*	0.108	-2.293	-0.160	-1.343**	0.772+	0.523	0.455	0.419
	[0.620]	[0.992]	[0.658]	[1.412]	[0.616]	[0.451]	[0.419]	[0.547]	[0.525]	[0.517]
Sulsel	-0.428	-1.482**	-0.302	-0.585	-0.913*	-1.507***	1.529**	0.0230	0.522	0.311
	[0.655]	[0.544]	[0.579]	[0.688]	[0.450]	[0.426]	[0.551]	[0.758]	[0.330]	[0.361]
Kalteng					2.207***		0.824		1.148*	
					[0.486]		[0.546]		[0.539]	
Constant	0.265	0.545+	-0.626**	0.270	0.340+	1.290**	0.544*	-0.318	0.909+	-0.262
	[0.556]	[0.318]	[0.241]	[0.247]	[0.204]	[0.398]	[0.274]	[0.513]	[0.469]	[0.298]
Observations	232	219	201	232	322	113	324	135	207	207
R^2	0.114	-0.236	-0.168	-0.401	-0.238	0.347	-0.001	0.110	0.112	0.123
Kleibergen–Paap F-stat	45.84	20.43	22.96	11.79	19.15	35.42	53.55	86.88	72.48	68.36
Robust CS (lower bound)	0.133	0.431	0.028	0.502	0.323	-0.29	-0.704	-0.465	-0.584	-0.462
Robust CS (upper bound)	0.586	1.147	1.722	2.688	1.427	0.338	-0.2	-0.022	0.189	0.143
Nonrobust (Wald) CS (lower bound)	0.164	0.374	-0.085	0.301	0.242	-0.219	-0.679	-0.470	-0.624	-0.452
Nonrobust (Wald) CS (upper bound)	0.6	1.	1.436	1.968	1.199	0.375	-0.19	-0.034	0.128	0.14

Note: Observations only include matched individuals across the control and treatment groups. Individuals living in a region where export expansion is larger than the 75th percentile are considered to be in the treated group. Standard errors are provided in brackets and clustered within districts. The model uses exports from the ASEAN region to the PRC as the instrument and includes the following countries: Brunei Darussalam, Singapore, Myanmar, Malaysia, the Philippines, and Thailand. Individual-level data cover all adult individuals that exist across the three latest IFLS waves: 2000, 2007, and 2014 (balanced panel). Continuous variables are transformed into standardized variables with mean = 0 and standard deviation = 1. Covariates are used across all estimations. The Stock–Yogo (2005) critical value with 10% maximal bias is 16.38, while the suggested minimum value for F-stat that is robust to heteroscedasticity, serial correlation, and clustering problems (effective F-stat) is 23.1. Confidence sets (CS) are based on 1,000 grid points in the interval of [-0.5, 2]. Robust CS are based on the Anderson–Rubin (AR) test and robust to heteroskedasticity and clustering issues. Wald CS are based on 2SLS estimates and are not robust to weak instruments. Significance: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.0$.

Table A12.
The Impact of Export Expansion to the PRC on Earnings Growth by Decile of Earnings: 2SLS Estimation—Full Results, Matched Datasets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Indonesia's export expansion 2000–2007, 2000 district weight (standardized)	0.296	0.810***	0.572*	0.490	0.321	0.0913	0.0761	0.251*	-0.0878	0.0419
	[0.204]	[0.244]	[0.244]	[0.359]	[0.227]	[0.150]	[0.139]	[0.103]	[0.103]	[0.151]
Gender, 1 = male, 0 = female	0.203	0.294+	0.264	-0.0152	0.127	0.0997	-0.142	-0.0832	-0.0727	0.148
	[0.176]	[0.159]	[0.178]	[0.155]	[0.133]	[0.163]	[0.0976]	[0.164]	[0.112]	[0.190]
Age (years) in 2000 (standardized)	-0.126	-0.0671	-0.179**	-0.0596	-0.0613	-0.0731	-0.0789	-0.0410	0.165**	0.263*
	[0.0986]	[0.0809]	[0.0656]	[0.0802]	[0.0596]	[0.0688]	[0.0541]	[0.0557]	[0.0524]	[0.122]
Father's years of education in 2000 (standardized)	-0.00440	0.132+	0.0325	0.00743	0.0788*	0.0985+	-0.0330	-0.118*	0.0112	0.0163
	[0.0770]	[0.0689]	[0.0526]	[0.0504]	[0.0346]	[0.0573]	[0.0381]	[0.0507]	[0.0534]	[0.0650]
Sufficient ventilation in 2000, 1 = yes, 0 = no	0.0462	-0.131	-0.00836	0.162	0.233+	0.143	0.167	-0.0492	0.211	0.214
	[0.184]	[0.197]	[0.139]	[0.152]	[0.134]	[0.211]	[0.127]	[0.235]	[0.151]	[0.271]
Piles of trash around the house in 2000, 1 = yes, 0 = no	-0.295	-0.00937	0.312	-0.932*	-0.269	-0.443	0.124	-0.325	-0.301	-1.047
	[0.246]	[0.275]	[0.270]	[0.457]	[0.218]	[0.424]	[0.277]	[0.437]	[0.427]	[0.698]
District's tradable employment, cumulative annual growth 1997–2000 (standardized)	-0.143*	-0.137	0.0336	-0.0627	0.0896	-0.0231	0.0438	-0.130	0.0386	-0.0200
	[0.0673]	[0.105]	[0.0924]	[0.0522]	[0.119]	[0.0804]	[0.0455]	[0.0801]	[0.0461]	[0.123]
Sumatera Barat	-1.365***	-0.506	0.347*	0.538*	-0.260	-0.124	-0.118	1.048*	0.0398	0.596
	[0.387]	[0.395]	[0.174]	[0.273]	[0.241]	[0.247]	[0.206]	[0.477]	[0.263]	[0.427]
Riau	-1.960***			0.194			-0.360	0.346		

	[0.448]			[0.437]			[0.399]	[0.463]		
Sumatera Selatan	-0.844*	-0.339	0.524**	-0.132	-0.128	-0.275	-0.199	-0.00366	0.695*	0.586
	[0.394]	[0.365]	[0.180]	[0.321]	[0.251]	[0.287]	[0.267]	[0.578]	[0.334]	[0.382]
Lampung	-2.323***	-0.660	0.493+	-0.111	-0.286	-1.100***	-0.0669	0.367	0.126	0.0257
	[0.393]	[0.415]	[0.281]	[0.249]	[0.181]	[0.330]	[0.287]	[0.511]	[0.192]	[0.391]
DKI Jakarta	-1.680**	-1.758+	-1.238	-1.161	-1.216	-0.698+	-0.0963	0.236	0.299	0.164
	[0.571]	[1.022]	[1.113]	[0.884]	[0.880]	[0.387]	[0.484]	[0.458]	[0.317]	[0.540]
Jawa Barat	-1.477**	-0.744**	0.425*	-0.0692	-0.215	-0.362	-0.0253	0.408	0.0244	0.582
	[0.514]	[0.262]	[0.202]	[0.252]	[0.133]	[0.261]	[0.201]	[0.452]	[0.170]	[0.415]
Jawa Tengah	-2.158***	-0.709***	0.0853	-0.202	-0.566***	-0.343	-0.153	0.700	-0.282	0.246
	[0.391]	[0.194]	[0.217]	[0.239]	[0.125]	[0.320]	[0.265]	[0.526]	[0.332]	[0.460]
Jawa Timur	-1.563***	-0.581+	0.205	-0.375	-0.457**	0.114	-0.0738	0.0550	-0.164	0.338
	[0.392]	[0.312]	[0.162]	[0.320]	[0.151]	[0.338]	[0.196]	[0.548]	[0.247]	[0.408]
Bali	-1.350**	-0.503	-0.363+	0.429	-0.417	-0.315	-0.162	0.370	0.138	1.054*
	[0.416]	[0.356]	[0.208]	[0.415]	[0.375]	[0.257]	[0.196]	[0.453]	[0.218]	[0.464]
NTB	-1.637***	0.419	0.608**	-0.229	-0.156	0.268	0.146	0.595	0.108	0.469
	[0.372]	[0.451]	[0.199]	[0.237]	[0.173]	[0.349]	[0.197]	[0.490]	[0.142]	[0.425]
Kalsel	-1.977***	-1.339*	-0.253	-0.937	-0.687+	-0.551+	0.110	0.498	0.0675	0.503
	[0.551]	[0.636]	[0.428]	[0.956]	[0.354]	[0.325]	[0.247]	[0.550]	[0.195]	[0.698]
Sulsel	-2.023***	-1.512**	0.655	-0.965	-0.336	-0.166	-0.00901	0.818	0.316+	-0.315
	[0.504]	[0.537]	[0.594]	[0.747]	[0.346]	[0.398]	[0.483]	[0.501]	[0.176]	[0.456]

Yogyakarta		-0.389	0.343	0.114	-0.00361	-0.00109	-0.0539	0.810	-0.0668	0.424
		[0.364]	[0.236]	[0.199]	[0.234]	[0.578]	[0.203]	[0.496]	[0.183]	[0.395]
Kalteng					0.0773				0.807**	
					[0.327]				[0.272]	
Constant	2.470***	0.753**	-0.326+	0.101	-0.120	-0.0316	-0.106	-0.557	-0.212	-1.324**
	[0.437]	[0.243]	[0.183]	[0.228]	[0.154]	[0.246]	[0.181]	[0.515]	[0.215]	[0.409]
Observations	156	166	167	187	277	93	279	120	193	175
R^2	0.218	-0.148	-0.114	-0.029	-0.081	0.192	0.053	0.151	0.145	0.171
Kleibergen–Paap F-stat	23.29	24.61	28.26	10.66	17.29	56.21	58.18	88.47	77.78	48.90
Robust CS (lower bound)	-0.242	0.413	0.126	-0.115	-0.117	-0.26	-0.24	0.033	-0.285	-0.26
Robust CS (upper bound)	0.641	1.474	1.152	1.69	0.886	0.348	0.323	0.441	0.128	0.353
Nonrobust (Wald) CS (lower bound)	-0.104	0.331	0.093	-0.215	-0.124	-0.202	-0.197	0.05	-0.29	-0.254
Nonrobust (Wald) CS (upper bound)	0.696	1.289	1.05	1.194	0.766	0.385	0.348939	0.453	0.114	0.338

Note: Observations only include matched individuals across the control and treatment groups. Individuals living in a region where export expansion is larger than the 75th percentile are considered to be in the treated group. Standard errors are provided in brackets and clustered within districts. The model uses exports from the ASEAN region to the PRC as the instrument and includes the following countries: Brunei Darussalam, Singapore, Myanmar, Malaysia, the Philippines, and Thailand. Individual-level data cover all adult individuals that exist across the three latest IFLS waves: 2000, 2007, and 2014 (balanced panel). Continuous variables are transformed into standardized variables with mean = 0 and standard deviation = 1. Covariates are used across all estimations. The Stock–Yogo (2005) critical value with 10% maximal bias is 16.38, while the suggested minimum value for F-stat that is robust to heteroscedasticity, serial correlation, and clustering problems (effective F-stat) is 23.1. Confidence sets (CS) are based on 1,000 grid points in the interval of [-0.5, 2]. Robust CS are based on the Anderson–Rubin (AR) test and robust to heteroskedasticity and clustering issues. Wald CS are based on 2SLS estimates and are not robust to weak instruments. Significance: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Figure A1.
Balance of Covariates: Overall

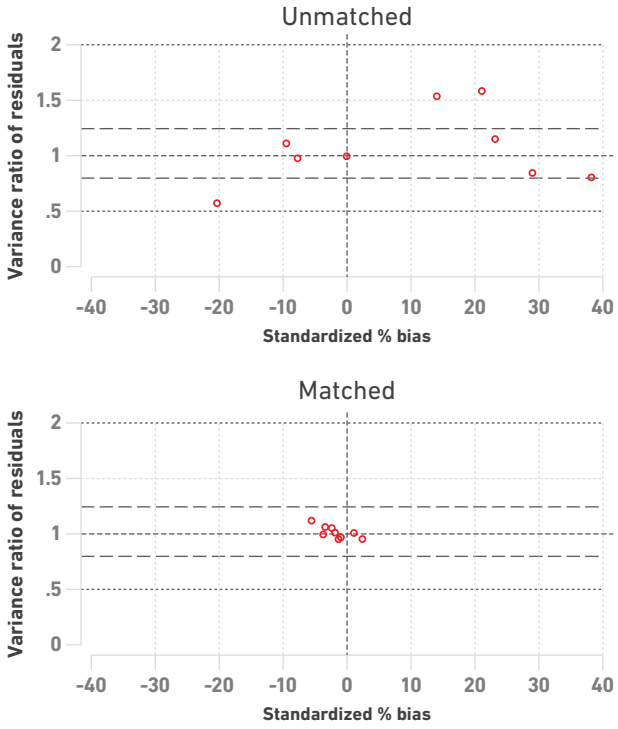
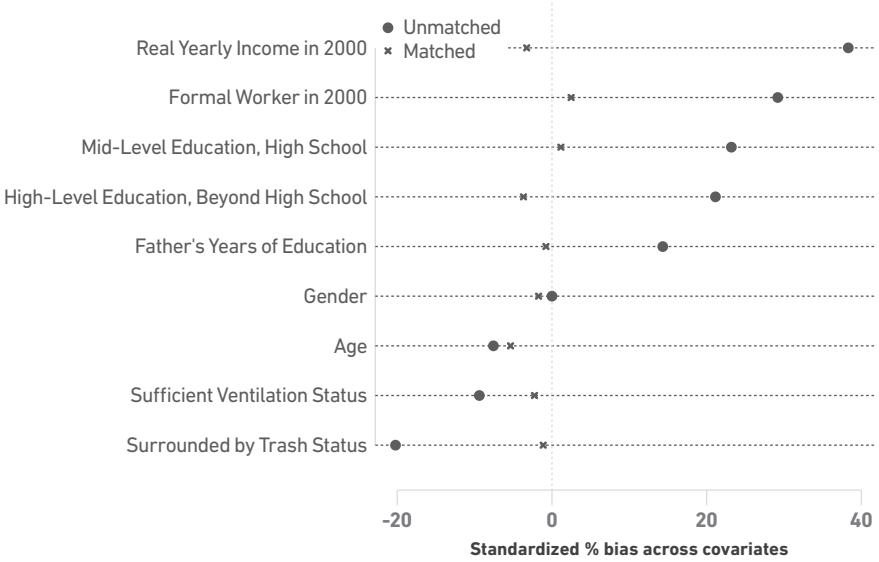


Figure A2.
Balance of Covariates: By Variables



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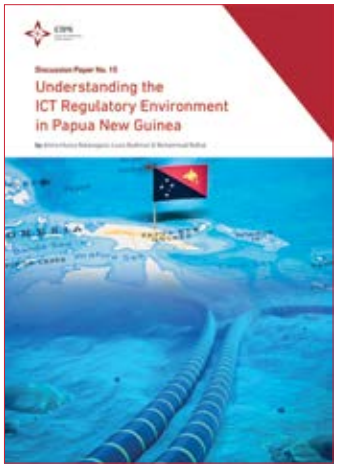

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