

# Explaining the 1987-1996 Changes in the Border/Interior Labor Market Structure in Mexico



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# Explaining the 1987-1996 Changes in the Border/Interior Labor Market Structure in Mexico

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**Abstract:** This study analyzes changes in the large/small firm wage differential between the border and interior regions of Mexico between 1987 and 1996. During this period, Mexico experienced an upsurge in foreign direct investment, particularly to the large-scale export industry located along the U.S.-Mexico border. As a result of this investment, workers have migrated from the interior to the border to take advantage of increasing employment opportunities in the region. Changes in both foreign direct investment and migratory patterns may have changed the labor market structure along the border relative to that in the interior. Specifically, this study compares shifts in the wage differential between large and small firms along the border to that in the interior using data from the 1987 and 1996 *Encuesta nacional de empleo urbano*. The results indicate that the border region's large/small sectoral wage gap narrowed while increasing in the interior. Unbalanced growth dynamics arising from the fast expansion in the large-scale industrial sector may be forcing small businesses to increase wages to compete for workers. Alternatively, increased migration of workers to the border area may have led to larger increases in labor supply than FDI-induced shifts in labor demand, creating downward pressure on the wages paid by large firms.

JEL: J31, J61, R23

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## 1. Introduction

The Mexican economy underwent substantial structural changes and reform after the economic crisis of the early 1980s. Public policy shifted to move the country from a closed economy supported by a large public sector to an open one reliant on trade and manufacturing. In particular, Mexico opted for an export-based development strategy to accelerate economic growth. Governmental policies have been focused on creating an environment conducive to large-scale industrial development primarily funded through foreign direct investment (FDI). As a result, over the last decade, Mexico has been able to attract unprecedented levels of FDI to underwrite its expanding industrial program (Weintraub, 1996). Given that the largest share of FDI has gone to the U.S.-Mexico border region, this investment-led development policy may have impacted the country's regional labor market structure. In particular, FDI invested along the border has shifted relative labor demand, and, consequently, altered the wage structure for both large and small firms along the border.

This study analyzes the impact of FDI flows on the labor market structure along the northern border of Mexico using 1987 and 1996 data from Mexico's *Encuesta nacional de empleo urbano* (National Urban Employment Survey or ENEU). Specifically, 1987-1996 changes in the wage gap between workers in large and small firms along the border is compared to those observed in the interior of the country. Understanding the causes of shifts in regional labor markets may provide an answer to the substantial increase in internal migration resulting from FDI flows (e.g., Rivera-Batiz, 1986). In addition, awareness of FDI-induced changes in the regional large/small firm wage structure might enable policy-makers to develop programs that also promote the small business sector.

The findings suggest that the wage differential between small and large firms along the border decreased between 1987 and 1996 compared to the interior region of Mexico. The national trend of increasing labor market returns for the large firm worker is not found along the border. This regional effect is more pronounced in manufacturing than in the service industry. Shifts in relative labor demand may partially explain the different wage-determining structure found along the U.S.-Mexico border region. Specifically, unbalanced growth dynamics surrounding the fast expansion in the large-scale industrial sector could be forcing small businesses to increase wages to compete for workers (Baumol, 1967). Also, increased internal migration to border communities may have led to larger increases in labor supply than FDI-induced shifts in labor demand. This in turn may have created downward pressure on large firm wages.

This study is organized as follows. Section 2 presents a background discussion of the Mexican labor market and flows of FDI. Section 3 describes the ENEU data and summarizes the descriptive statistics. Section 4 presents the Juhn, Murphy, Pierce (1991) earnings decomposition that is used to analyze the regional differential in the sectoral wage gap. Section 5 analyzes the regional wage differential for the manufacturing and service industries. Section 6 discusses the empirical findings and Section 7 provides some concluding remarks.

## **2. Background**

A wage premium accruing to large firm workers is a well-established phenomenon in both developed and developing countries. Numerous empirical studies find that the wage premium for large (relative to small) firms persists even after controlling for human capital endowments and job characteristics (for example, Mellow, 1982; Brown and Medoff,

1989; Evans and Leighton, 1989; Schmidt and Zimmerman, 1991). Although these studies analyze the large firm wage premia in industrialized countries, there is descriptive evidence to suggest that a similar structure exists in the Mexican labor market. Fleck and Sorrentino (1994) report that the purchasing power of workers' earnings in large manufacturing industry is almost twice that as in the trade and service industries, typically small establishments. Furthermore, Hanson (1997) finds that regional variation in the Mexican labor market wage structure has been compressed as a result of trade reform. However, the regional structure of the large/small firm wage differential has not been addressed.

During the 1970s, Mexico had a closed economy that relied heavily on public-sector expenditures. As a result of the economic crisis in 1982, however, the Mexican economy turned to international trade and investment to generate needed foreign exchange. After an economic crisis in 1986, the Mexican government made the attraction of FDI a top priority and granted special incentives to firms making these investments (Haddad and Harrison, 1993; Weintraub, 1996). In particular, economic restructuring liberalized the regulations for the *maquiladora*<sup>1</sup> industry and expanded the program to the interior of Mexico in approved locations (Peres Nuñez, 1990). Flows of FDI to Mexico followed the expansion of the maquiladora industry and the real level of FDI to the country increased by 238 percent between 1987 and 1995.<sup>2</sup> Most of these plants have located along the U.S.-Mexico border (see Feenstra and Hanson, 1997).

Given the increasing levels of FDI, how have these inflows impacted the labor market along the U.S.-Mexico border? In particular, how has the large/small firm wage

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<sup>1</sup> The maquiladora program is an in-bond industrial program initiated by the Mexican government in 1965 to promote development along the northern border.

<sup>2</sup> The December 1994 Mexican currency crisis disrupted FDI flows during the following years. The real level of FDI to Mexico in 1994 was 2.8 times that in 1987 (IMF, 1997).

gap in the border region evolved compared to that in the interior? As a result of the magnitude of FDI flows, substantial changes in relative labor demand along the border would be expected. Specifically, Baumol (1967) describes a process in which growth in a technologically progressive sector of the economy inevitably increases the costs (i.e., wages) of technologically unchanging sectors. Consequently, it is reasonable to assume that labor demand from large export-based industrial firms along the border may have increased wages in this region's labor markets, leading to higher costs and lower profits for smaller firms.

More recently, Rauch (1997) proposes an unbalanced growth model to help explain uneven growth patterns between economic sectors after foreign trade is liberalized. In his model, sectoral growth rates are linked through product, labor, and capital markets. With an integrated labor force and balanced growth path, high growth in one sector can “pull along” the growth in other sectors. However, under an unbalanced growth path, the high growth in one sector can put a drag on the growth in other sectors by raising wages and lowering profitability, thus inducing a “cumulative decline”. In all, Rauch's model, as applied to northern Mexico, predicts that the high growth in the large firm sector along the border may be raising costs (i.e., wages) for small businesses and inhibiting their growth.

A second impact of FDI-induced changes in relative labor demand is increasing internal migration (e.g., Dávila and Sáenz, 1990; Rivera-Batiz, 1986). The working age population increased by 38.4 percent along the border between 1987 and 1996 while only increasing by 6.4 percent in the interior<sup>3</sup>. Furthermore, Feenstra and Hanson (1997) relate labor demand to capital flows in Mexico. They find that the sudden inflow of capital beginning in the 1980s, in particular along the border, resulted in a region-specific shock to

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<sup>3</sup> Source: 1987 and 1996 ENEU surveys.

labor demand. Labor demand in the border region increased significantly, driven by maquiladora development. They do not find a corresponding increase in labor demand in the interior of Mexico. Thus, if the relative increase in labor supply along the border exceeds the increase in demand created by industrial development there, market wages in the large firm sector could actually fall.

### **3. Sample Summary Statistics**

Data from Mexico's *Encuesta nacional de empleo urbano* (ENEU) for the third quarter of 1987 and 1996 are employed to empirically estimate changes in the regional wage differential between large and small firms. The ENEU is particularly suited for this purpose because it provides basic socio-economic information on the Mexican urban population. The survey is conducted with the objective of obtaining data on employment, unemployment, and underemployment as well as basic information on other labor market outcomes such as wages, occupation, industry, etc. (INEGI, 1996:3). Nine of the major metropolitan areas included in the ENEU are utilized in this study. These are the border cities of Tijuana, Ciudad Juárez, Nuevo Laredo and Matamoros; and the interior metropolitan areas of Mexico City, Guadalajara, Monterrey, Torreón and Chihuahua. The sample consists of employed individuals between the ages of 16 and 65 surveyed during the months of July-September 1987 and 1996.

Table 1 presents the definition of variables, and Tables 2 and 3 report the descriptive statistics of the sample by region, employment status and small/large firm employment. A small firm is defined as one that employs 100 workers or less.<sup>4</sup> Several points are worth noting from these tables. In 1996 the actual log of hourly wages of

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<sup>4</sup> See Mercado (1993) and Eroles (1995) for a discussion on the classification criteria for

**Table 1**  
**Definition of Variables**

<b>Variable</b>		
LNWAGE	=	natural log of hourly wages
EXPER	=	age minus years of schooling minus 6
EXPER2	=	EXPER squared divided by 100
SCHOOL	=	number of years of formal education
FEMALE	=	1 if female; 0 otherwise
MARRIED	=	1 if married; 0 otherwise
PTIME	=	1 if part time; 0 otherwise
NREGFIRM	=	1 if employed at non-registered firm; 0 otherwise
MANUFG	=	1 if industry manufacturing; 0 otherwise
CONSTR	=	1 if industry construction; 0 otherwise
TRNSPCOM	=	1 if industry transportation, communication, utilities; 0 otherwise
COMMERCE	=	1 if industry commerce; 0 otherwise
SERVICE	=	1 if industry service; 0 otherwise
PROFESSIONAL	=	1 if occupation professional; 0 otherwise
MANAGER	=	1 if occupation manager; 0 otherwise
TECH	=	1 if occupation technical; 0 otherwise
MAINREPR	=	1 if occupation production, maintenance, repair; 0 otherwise
OPERATOR	=	1 if occupation operator; 0 otherwise
SALES	=	1 if occupation sales; 0 otherwise
LABORER	=	1 if occupation laborer; 0 otherwise

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small businesses in Mexico.

**Table 2**  
**Border Descriptive Statistics: Means**  
**(standard deviations in parentheses)**

Variable	1987		1996	
	Small Firm	Large Firm	Small Firm	Large Firm
LNWAGE	2.3375 (0.633)	2.4294 (0.475)	2.2435 (0.777)	2.2574 (0.636)
EXPER	21.0991 (14.701)	13.3331 (10.765)	20.6731 (13.892)	14.1842 (11.041)
EXPER2	6.6118 (7.703)	2.9356 (4.515)	6.2034 (7.153)	3.2307 (4.730)
SCHOOL	6.7674 (4.248)	8.8370 (4.190)	8.2671 (4.515)	9.5306 (4.155)
FEMALE	0.2216 (0.415)	0.4728 (0.499)	0.2660 (0.442)	0.4257 (0.495)
MARRIED	0.5288 (0.499)	0.4230 (0.494)	0.5156 (0.500)	0.4544 (0.498)
SELFEMP	0.3670 (0.482)	0.0000 (0.000)	0.4193 (0.493)	0.0007 (0.026)
PTIME	0.1439 (0.351)	0.1026 (0.3035)	0.1770 (0.382)	0.0862 (0.281)
MANUFG	0.1639 (0.370)	0.6045 (0.489)	0.1175 (0.322)	0.5999 (0.490)
CONSTR	0.1263 (0.332)	0.0180 (0.133)	0.0964 (0.295)	0.0182 (0.134)
TRNSPCOM	0.0673 (0.251)	0.0464 (0.210)	0.0917 (0.289)	0.0351 (0.184)
COMMERCE	0.3512 (0.477)	0.0565 (0.231)	0.3398 (0.474)	0.1015 (0.302)
SERVICE	0.2912 (0.454)	0.2746 (0.446)	0.3522 (0.478)	0.2195 (0.414)
PROF	0.0455 (0.209)	0.0681 (0.252)	0.0649 (0.247)	0.0774 (0.0267)
MANAGER	0.1051 (0.307)	0.2813 (0.450)	0.0669 (0.250)	0.1811 (0.385)
TECH	0.0174 (0.131)	0.0440 (0.205)	0.0378 (0.191)	0.0516 (0.221)
PRECPROD	0.3014 (0.459)	0.4273 (0.495)	0.2285 (0.420)	0.0504 (0.219)
OPERATOR	0.0854 (0.280)	0.0370 (0.189)	0.1279 (0.334)	0.4056 (0.491)
SALES	0.2120 (0.409)	0.0269 (0.162)	0.2185 (0.413)	0.0561 (0.230)
LABORER	0.2332 (0.423)	0.1155 (0.320)	0.2554 (0.436)	0.1777 (0.382)
<i>N</i>	5,167	3,274	5,497	4,048
Weighted <i>N</i>	311,523	206,712	432,276	358,793

**Table 3**  
**Interior Descriptive Statistics: Means**  
**(standard deviations in parentheses)**

Variable	1987		1996	
	Small Firm	Large Firm	Small Firm	Large Firm
LNWAGE	2.0837 (0.698)	2.4122 (0.551)	1.9410 (0.773)	2.2906 (0.780)
EXPER	19.841 (14.806)	15.936 (12.240)	19.5312 (14.092)	16.0606 (11.754)
EXPER2	6.1282 (7.539)	4.0369 (5.479)	5.8004 (7.0851)	3.9607 (5.160)
SCHOOL	7.5766 (4.696)	10.2449 (4.814)	8.6173 (4.367)	10.9356 (4.178)
FEMALE	0.3140 (0.464)	0.3426 (0.475)	0.3509 (0.477)	0.4005 (0.490)
MARRIED	0.5191 (0.500)	0.5656 (0.495)	0.5189 (0.499)	0.5561 (0.497)
SELFEMP	0.3125 (0.463)	0.0000 (0.000)	0.3545 (0.478)	0.0010 (0.030)
PTIME	0.1734 (0.379)	0.1231 (0.329)	0.2084 (0.406)	0.1373 (0.344)
MANUFG	0.2147 (0.411)	0.3415 (0.474)	0.1866 (0.389)	0.3307 (0.471)
CONSTR	0.0810 (0.273)	0.0364 (0.187)	0.0656 (0.248)	0.0137 (0.116)
TRNSPCOM	0.0536 (0.225)	0.1014 (0.302)	0.0598 (0.237)	0.0678 (0.251)
COMMERCE	0.3286 (0.470)	0.0739 (0.262)	0.3191 (0.466)	0.1267 (0.333)
SERVICE	0.3321 (0.467)	0.4469 (0.497)	0.3613 (0.480)	0.4533 (0.498)
PROF	0.0530 (0.224)	0.1130 (0.317)	0.0624 (0.242)	0.1243 (0.330)
MANAGER	0.1353 (0.342)	0.3446 (0.476)	0.0675 (0.251)	0.1702 (0.376)
TECH	0.0217 (0.146)	0.0703 (0.256)	0.0324 (0.177)	0.0769 (0.266)
PRECPROD	0.2915 (0.455)	0.2110 (0.408)	0.2068 (0.405)	0.0563 (0.231)
OPERATOR	0.0586 (0.235)	0.0383 (0.192)	0.1532 (0.360)	0.2002 (0.400)
SALES	0.2145 (0.411)	0.0500 (0.218)	0.2200 (0.414)	0.0829 (0.276)
LABORER	0.2254 (0.418)	0.1708 (0.376)	0.2576 (0.437)	0.2892 (0.453)
<i>N</i>	11,347	7,537	10,694	6,269
Weighted <i>N</i>	3,165,608	2,449,454	3,736,247	2,212,330

workers in large firms in the interior averaged 2.9206 (an increase of 66.3 percent<sup>5</sup> from 1987) while those along the border averaged only 2.2574 (a decrease of 15.8 percent from 1987). However, the wages of small firm workers along the border averaged more than those in the interior in both 1987 and 1996 (by 0.2538 and 0.3025 log-points, respectively).

Overall, workers in large firms averaged more years of education than those employed in small firms. The large/small firm education gap was more than one year less along the border than in the interior (1.26 and 2.32 years, respectively). However, the experience gap between large and small firm workers was greater along the border. Workers in small (relative to large) firms averaged 6.48 more years of potential experience along the border and 3.47 more years in the interior. Approximately the same share of females worked in large firms in both regions (42.6 percent along the border and 40.1 percent in the interior). However, females along the border only captured 26.6 percent of small firm employment compared to 35.1 percent in the interior.

Finally, it is interesting to note that the employment share in the border's manufacturing industrial sector remained unchanged between 1987 and 1996, accounting for about 60 percent of large firm employment whereas the region's small manufacturers share fell from 16 percent to 12 percent. In contrast, the large firm services sector represented the greatest share of large firm employment in the interior (about 45 percent in each year) with small service firms increasing their employment share by almost three percent during the 1987-1996 period.

The summary descriptive statistics suggest that regional differences in the changes in the Mexican labor market structure between 1987 and 1996 exist vis-à-vis small and

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<sup>5</sup> Calculated as  $[\exp(0.5084) - 1]$  multiplied by 100.

large firm employment share. If flows of FDI to the U.S.-Mexico border region have altered the labor market structure there, an investigation of wage-structure changes is warranted. Additionally, unbalanced growth dynamics that appear to be impacting the labor market along the border suggest that high growth in the large-scale sector could increase the costs (specifically wages) for small businesses. Therefore, the following section will analyze the observed changes in the large/small firm wage differential for the border and interior regions and identify the factors that may be contributing to this regional variation.

#### **4. Empirical Analysis and Results**

The sample descriptive statistics suggest that regional differences in the changes in the Mexican labor market structure between 1987 and 1996 exist vis-à-vis small and large firms. Recall that large firm workers in the interior region earned about 36.6 percent (0.3119 log-points) more than workers in small firms in 1987. By 1996, the large/small firm wage gap in the interior increased to 41.9 percent (0.3496 log-points). In contrast, large firm workers along the border earned only 9.6 percent (0.0919 log-points) more than workers in small firms in 1987. The wage gap fell to 1.4 percent in 1996.

What are the factors that account for the regional changes in the observed sectoral wage differential between 1987 and 1996? To answer this question, the Juhn, Murphy, and Pierce (1991) (JMP) earnings decomposition technique is employed. Blau and Kahn (1992) used the JMP decomposition to explain the changes that occurred in the gender pay gap in the United States between 1974 and 1987. Here the JMP methodology allows for the consideration of the role of sectoral differences in both the observed and unobserved characteristics of the sample, as well as the “prices” of these characteristics, in explaining the change in the large/small firm wage gap between 1987 and 1996.

Let the log of hourly wage,  $Y_{itL}$ , for the  $i$ th worker employed in a large firm in year  $t$  be given by:

$$(1) \quad Y_{itL} = X_{itL} \beta_{itL} + \theta_{itL} \sigma_{itL},$$

where  $X_{itL}$  and  $\beta_{itL}$  represent the worker's human capital characteristics and the returns to those characteristics;  $\theta_{itL}$ , is a standardized residual (i.e.,  $\theta_{it} = e_{it}/\sigma_{it}$ ), and  $\sigma_{itL}$  is the standard deviation of residual earnings in year  $t$ .

The year  $t$  large-small sectoral log-wage differential,  $D_t$ , can be written as:

$$(2) \quad D_t \equiv Y_{tL} - Y_{tS} = \Delta X_t \beta_{tL} + \Delta \theta_t \sigma_{tL}$$

where  $\Delta$  represents the average inter-sectoral difference for  $X_t$  and  $\theta_t$ . Using equation (2), the 1987-1996 difference in the large/small log-wage differential can be decomposed into:

$$(3) \quad D_{96} - D_{87} = (\Delta X_{96} - \Delta X_{87})\beta_{87L} + \Delta X_{96}(\beta_{96L} - \beta_{87L}) + (\Delta \theta_{96} - \Delta \theta_{87})\sigma_{87L} + \Delta \theta_{96}(\sigma_{96L} - \sigma_{87L}).$$

The first term on the right-hand side of (3) captures the 1987-1996 change in the inter-sectoral wage differential that can be explained by differences in observed mean personal characteristics. The second term measures the portion of the wage gap differential explained by changes in the returns to observed human capital, evaluated at the 1996 inter-sectoral differences in characteristics. The third term reflects the 1987-1996 change in the residual wage position of small firm workers relative to large firm workers, evaluated at the residual standard deviation of the large firms' log-wages in 1987. The last term captures the 1987-1996 changes in the returns to unobservable skills. Thus, it is possible to evaluate the regional difference in sectoral log-wages in terms of both observed

(or measurable) and unobserved individual characteristics and the returns to these characteristics.

Tables A1 and A2 of the Appendix report the results of estimating equation (1) for small and large firm workers in 1987 and 1996 for the border and interior region.  $X_i$  includes controls for years of education, years of potential experience and its square, gender, marital and employment status, as well as industrial and occupational dummy variables. As would be expected, in each regression, wages are positively related to experience (but at a decreasing rate), increase with years of schooling, and are higher for those married but lower for females. Moreover, part-time workers seem to earn a wage premium over full-time labor.

The rate of return to an additional year of schooling for small firm workers increased by 49.6 percent along the border between 1987 and 1996, while increasing by only 17.4 percent for these workers in the interior. In contrast, an increase in the rate of return to a year of education favored those employed in large firms in the interior (46.7 percent compared to a 25.2 percent increase for border large firm workers). Furthermore, the rate of return for an additional year of experience was lower in 1996 than in 1987 along the border for small and large firm workers (by 4.1 and 14.8 percent, respectively). Nonetheless, the return to experience increased for workers in both sectors in the interior.

The decomposition of the difference in the border and interior regions' inter-sectoral log-wage gaps is presented in Table 4 (see equation [3]). In particular, note that the log-wage gap between large and small firm workers along the border fell by over eight percent (0.0919 to 0.0139 log-points) between 1987 and 1996.

**Table 4**  
**Decomposition of Large/Small Firm 1987-1996 Wage Differential**

	<b>Border</b>		<b>Interior</b>	
Log-Wage Differential				
1987	0.0919		0.3119	
1996	0.0139		0.3496	
Standardized Residual				
1987	0.0170		-0.2643	
1996	-0.0315		-0.1937	
Standard Deviation of Error				
$\sigma_{87L}$	0.3508		0.4295	
$\sigma_{96L}$	0.4631		0.5692	
<hr/>				
1987-1996 Differential	-0.0781		0.0376	
<hr/>				
(1) Observed Characteristics $(\Delta X_{96} - \Delta X_{87})\beta_{87L}$	-0.0640		-0.0676	
(2) Observed Prices $\Delta X_{96}(\beta_{96L} - \beta_{87L})$	-0.0346		0.1085	
(3) Unobserved Characteristics $(\Delta\theta_{96} - \Delta\theta_{87})\sigma_{87L}$	0.0170		-0.0303	
(4) Unobserved Prices $\Delta\theta_{96}(\sigma_{96L} - \sigma_{87L})$	0.0035		0.0270	
<hr/>				
Disaggregation of (1) and (2) into j	<b>(1)</b>	<b>(2)</b>	<b>(1)</b>	<b>(2)</b>
EXPER	0.0232	0.0175	0.0102	0.0257
EXPER2	-0.0180	-0.0013	-0.0080	-0.0348
SCHOOL	-0.0359	0.0141	-0.0184	0.0568
FEMALE	0.0064	0.0028	-0.0016	-0.0004
MARRIED	0.0027	-0.0030	-0.0006	0.0023
PTIME	-0.0201	0.0120	-0.0069	0.0045
CONSTR	0.0041	0.0043	0.0001	-0.0086
TRNSPCOM	0.0000	-0.0091	-0.0040	0.0006
COMMERCE	-0.0128	-0.0362	-0.0094	-0.0021
SERVICE	0.0168	-0.0295	0.0010	0.0063
MANAGER	0.0054	-0.0084	0.0044	0.0073
TECH	0.0008	-0.0049	0.0004	-0.0035
MAINREPR	0.1223	0.0069	0.0181	0.0313
OPERATOR	-0.1405	-0.0520	-0.0222	-0.0103
SALES	-0.0061	0.0351	-0.0048	0.0383
LABORER	-0.0123	0.0171	-0.0259	-0.0049

On the other hand, the large/small log-wage gap increased in the interior by almost four percent (0.3119 to 0.3496 log- points). The relative size of the wage differential in each region is also of interest. In 1987, the border region's large/small firm wage gap was 29 percent of that in the interior. By 1996, the regional differential widened and the large/small firm wage gap along the border fell to only four percent of the sectoral wage gap in the interior.

Decomposition of the sectoral wage differential (-0.0781 log-points) observed along the northern border of Mexico indicates that 1987-1996 changes in observed characteristics accounted for 81.9 percent of the large/small firm reduction in the wage gap during the period. In other words, human capital endowments of large and small firm workers became more homogeneous in 1996 than in 1987. This effect coupled with the impact from the fall in observed prices indicates, *ceteris paribus*, that the large/small firm wage gap would have disappeared altogether by 1996. However, changes in unobserved characteristics and prices served to widen the wage differential between large and small firm workers (by 0.0170 and 0.0035 log-points, respectively). The sectoral wage differential in the interior of Mexico increased during the 1987-1996 period by 0.0376 log-points. Decomposition of changes in the wage gap between large and small firm workers indicates that the large/small firm wage gap increase may be attributed to the rise in the price of labor market skills (both observed and unobserved). Again, convergence of measured and unmeasured levels of human capital between small and large firm workers served to narrow the sectoral wage differential during this period.

To investigate the role of inter-period changes in the sectoral differences in observed individual endowments and prices, the portions of the sectoral wage gap attributed to these components are separated and presented at the bottom of Table 4. The smaller difference

in the observed years of schooling between large and small firm workers along the border in 1996 (relative to 1987) explains the largest part of the wage differential attributed to changes in observed characteristics. Likewise, a 1987-1996 decrease in labor market returns at the industry level (-0.0705 log-points in the aggregate), relative to the manufacturing industrial sector, accounts for most of the impact from changes in observed prices along the border.

Disaggregation of the impact of 1987-1996 changes in the relative observed characteristics and prices on the interior large/small wage differential again points to more similar levels of education of large and small firm workers in 1996 compared to 1987. However, this effect (-0.0184 log-points) is only approximately 50 percent of that observed along the border. Shifts in the occupational distribution between large and small firm workers account for most of the change in the observed 1987-1996 sectoral wage differential. Furthermore, the 1987-1996 changes in labor market returns to education and the aggregate of the occupational dummy variables appear to contribute equally to the 1987-1996 sectoral wage gap attributed to changes in observed prices.

Numerous empirical studies find that the wage differential for large (relative to small) firms persists even after controlling for human capital endowments and job characteristics.<sup>6</sup> For example, Evans and Leighton (1989) show that the wage premium accruing to large firm workers increases directly with firm size. Furthermore, Harrison (1994) evaluates benefits of FDI and finds that large multinational firms typically pay higher wages than small firms. It would appear, then, that in Mexico this effect should become more pronounced with increases in FDI

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<sup>6</sup> See, for example, studies by Mellow (1982), Brown and Medoff (1989), Schmidt and Zimmerman (1991).

flows between 1987 and 1996. However, the foregoing empirical analysis reveals that the labor market wage structure along the border has been impacted differently during the 1987-1996 period relative to that of the interior, supporting the hypothesis that FDI has had an uneven impact along the border.

An alternative explanation for the uneven impact is that there was a widening in the distribution of firm size (small firms are becoming smaller and large firms bigger). Firm level data to definitively test this possibility are not readily available, however, a consistent redistribution is not apparent from the ENEU data.<sup>7</sup> In addition, the descriptive evidence indicates that Mexican small businesses face a more competitive environment for labor along the border as evidenced by the 30 percent higher wages there than in the interior.

## **5. Industrial Sector Analysis**

The narrowing of the border large/small firm wage gap between 1987 and 1996 is possibly driven solely by changes in the manufacturing industrial sector as a result of FDI flowing to this sector. Recall that the unbalanced growth model, as applied to export industrial development along the border, would predict that the rapid growth in large manufacturing firms forces small firms to increase wages to compete for labor. To investigate this possibility, the empirical analysis is now conducted at the industrial sector level.

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<sup>7</sup> For example, descriptive analysis of “large” firms indicates that the distribution of number of workers employed by medium-sized firms (101 to 250 employees) and large-sized firms (over 250 employees) remained unchanged. For “small” firms, there appears to be a 2.2 percent distributional

**Table 5**  
**Decomposition of Large/Small Firm 1987-1996 Wage Differential**  
**Manufacturing Sector**

	<b>Border</b>		<b>Interior</b>	
<hr/>				
Log-Wage Differential				
1987		0.0409		0.1838
1996		-0.0040		0.1907
Standardized Residual				
1987		-0.2044		-0.3196
1996		-0.1052		-0.3023
Standard Deviation of Error				
$\sigma_{87L}$		0.3287		0.4161
$\sigma_{96L}$		0.4119		0.5305
<hr/>				
1987-1996 Differential		-0.0449		0.0069
<hr/>				
(1) Observed Characteristics		-0.0238		-0.0684
$(\Delta X_{96} - \Delta X_{87})\beta_{87L}$				
(2) Observed Prices		0.0027		0.0478
$\Delta X_{96}(\beta_{96L} - \beta_{87L})$				
(3) Unobserved Characteristics		-0.0326		-0.0071
$(\Delta\theta_{96} - \Delta\theta_{87})\sigma_{87L}$				
(4) Unobserved Prices		0.0087		0.0345
$\Delta\theta_{96}(\sigma_{96L} - \sigma_{87L})$				
<hr/>				
Disaggregation of (1) and (2) into j	<b>(1)</b>	<b>(2)</b>	<b>(1)</b>	<b>(2)</b>
EXPER	0.0152	0.0643	-0.0213	0.0198
EXPER2	-0.0157	-0.0764	0.0060	-0.0392
SCHOOL	-0.0185	0.0193	-0.0365	0.0592
FEMALE	0.0057	0.0015	0.0003	-0.0008
MARRIED	0.0086	-0.0013	-0.0026	-0.0013
PTIME	-0.0191	-0.0047	-0.0144	0.0102
<hr/>				

shift towards micro-sized firms (less than 16 employees) from small-sized firms (16 to 100 employees).

**Table 6**  
**Decomposition of Large/Small Firm 1987-1996 Wage Differential**  
**Service Sector**

	<b>Border</b>	<b>Interior</b>		
Log-Wage Differential				
1987	0.2416	0.4667		
1996	0.3031	0.5071		
Standardized Residual				
1987	-0.1964	-0.5876		
1996	-0.1242	-0.3076		
Standard Deviation of Error				
$\sigma_{87L}$	0.4179	0.4395		
$\sigma_{96L}$	0.6024	0.6264		
<hr/>				
1987-1996 Differential	0.0616	0.0404		
<hr/>				
(1) Observed Characteristics $(\Delta X_{96} - \Delta X_{87})\beta_{87L}$	-0.0456	-0.0178		
(2) Observed Prices $\Delta X_{96}(\beta_{96L} - \beta_{87L})$	0.1145	0.1238		
(3) Unobserved Characteristics $(\Delta\theta_{96} - \Delta\theta_{87})\sigma_{87L}$	-0.0302	-0.1230		
(4) Unobserved Prices $\Delta\theta_{96}(\sigma_{96L} - \sigma_{87L})$	0.0229	0.0574		
<hr/>				
Disaggregation of (1) and (2) into j	<b>(1)</b>	<b>(2)</b>	<b>(1)</b>	<b>(2)</b>
EXPER	0.0345	0.0118	0.0305	0.0104
EXPER2	-0.0271	0.0041	-0.0204	-0.0207
SCHOOL	-0.0311	0.0798	-0.0198	0.1252
FEMALE	0.0012	0.0049	0.0001	-0.0011
MARRIED	0.0023	0.0110	-0.0003	0.0100
PTIME	-0.0255	0.0027	-0.0077	-0.0001

Equation (3) is estimated for the manufacturing and service sectors individually in both the border and interior regions (results are reported in Tables 5 and 6). The large/small firm wage gap narrowed significantly between 1987 and 1996 for the manufacturing industry along the border. Note that by 1996 the sectoral wage differential reversed in favor of the small manufacturing firm worker (the sectoral wage gap fell to -

0.0040 log-points). Furthermore, the large/small wage differential increased during this period for manufacturing industries located in the interior.

Decomposition of the 1987-1996 changes in the manufacturing large/small firm wage gap indicates that workers in both regions possessed increasingly similar levels of human capital endowments in 1996 than in 1987. Changes in mean individual characteristics (observed and unobserved) worked to narrow each region's wage differential. In contrast, changes in prices (observed and unobserved) served to widen the wage gap in both regions. However, it appears that changes in the labor market price structure along the border varied considerably from those observed in the interior during this period. Observed and unobserved returns to given levels of characteristics in the manufacturing sector increased over seven times more in the interior than along the border. Apparently, FDI flowing to the large-scale manufacturing industry along the northern U.S.-Mexico border has distorted that region's labor market wage structure.

Analysis of the service industry large/small wage differential indicates that the pattern of 1987-1996 changes is similar in both regions (refer to Table 6). Seemingly, a wage premia increasingly accrued to individuals employed in large (relative to small) service firms during this period. Yet, the inter-period sectoral wage gap increased by 52 percent more along the border than in the interior (0.0616 and 0.0404 log-points, respectively). Thus, FDI flowing to large-scale manufacturing along border seems to have benefited large service firms more than small ones.

The 1987-1996 change in the service industry's large/small wage differential for each region was decomposed. The results indicate that the widening in the large/small firm wage differential in each region may be explained by inter-period increases in labor market prices (observed and unobserved) favoring the large firm worker. As was seen in

the manufacturing industry, the aggregate labor market returns increased more in the interior than in the border region (0.1812 and 0.1374 log-points, respectively). Yet, the regional difference was not as pronounced in the service industry as in manufacturing. Once again, the convergence in the levels of human capital endowments of large and small service firm workers served to narrow the wage differential during the 1987-1996 period. However, it is difficult to explain the large impact from changes in unobserved characteristics of workers in the interior.

## **6. Discussion of Findings**

The large influx of FDI to the northern U.S.-Mexico border appears to have altered the labor market wage structure (specifically, the wage differential between large and small firm workers) in the region. The sectoral wage gap narrowed along the border between 1987 and 1996 while increasing in the interior. Furthermore, factors appear to impact the 1987-1996 change in the sectoral wage gap differently in each region. In particular, the labor market prices paid across firm size for individual characteristics changed for both regions. Yet, these prices decreased along the border and increased in the interior. It appears that there may be a national trend toward higher returns for large firm employment, except for the border urban areas.

Analysis of the 1987-1996 change in the large/small wage differential for the manufacturing industrial sector supports an unbalanced growth story. The sectoral wage gap for workers in small manufacturing firms along the border not only disappeared, but also a wage premium materialized for the small firm worker. Small firms are seemingly

being forced to pay higher wages in response to increased labor demand from the export-based FDI manufacturing sector.<sup>8</sup>

In contrast, the wage differential for manufacturing firms in the interior increased slightly during this period. The regional difference in the 1987-1996 sectoral wage gap appears to be the result of increasing returns favoring large manufacturing firm workers in the interior. Inter-period returns here increased 7.17 times those along the border.

The price structure in the service industry also increased for large firm workers in both regions between 1987 and 1996. Although the patterns are the same, the relative magnitudes suggest that the interior was influenced relatively more by changes in the labor market price structure. However, the increase in labor market returns was not as pronounced as seen in the manufacturing industry and favored the interior by only 32 percent.

## **7. Concluding Remarks**

This study shows that the labor market wage structure along the border changed differently between 1987 and 1996 from that in the interior. The border large/small sectoral wage gap narrowed while increasing in the interior. Furthermore, changes in labor market prices also impacted each region differently. Apparently a national trend towards higher returns for large firm employment is not evident in the border region. Recall that the large-small wage gap for workers in small manufacturing firms along the border reversed in favor of the small firm worker providing empirical evidence of unbalanced growth dynamics increasing wages for small firms.

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<sup>8</sup> Arguably, workers do not choose between small and large firm employment on the basis of wages alone. Other factors such as relative working conditions are also important. Indeed, to the extent that working conditions have relatively deteriorated for small firms along the border, it is possible that some of the effect can be attributed to this phenomena.

Although FDI may provide the necessary financial support to develop a specific sector such as the export-based industrial development along the U.S.-Mexico border, these inflows may have an unintended impact on small business development in this region. If small firm wages (relative to large firms) increased, as suggested by the empirical analysis, then the costs associated with operating a small business along the border might have increased. As such, small business development might be negatively affected by increasing industrial development. It remains to be seen, however, whether these effects remain in the long-term as small businesses learn to cope with more labor competition and increasing pressure to adapt.

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## Appendix

**Table A1**  
**Border Wage Function Estimates: Small and Large Firms**

Variable	Small Firms		Large Firms	
	1987	1996	1987	1996
CONSTANT	2.1316*** (0.068)	1.8115*** (0.073)	2.1430*** (0.056)	1.9662*** (0.071)
EXPER	0.0245*** (0.002)	0.0235*** (0.002)	0.0182*** (0.002)	0.0155*** (0.002)
EXPER2	-0.0366*** (0.004)	-0.0345*** (0.004)	-0.0256*** (0.005)	-0.0252*** (0.005)
SCHOOL	0.0391*** (0.003)	0.0585*** (0.003)	0.0445*** (0.002)	0.0557*** (0.003)
FEMALE	-0.1909*** (0.021)	-0.1073*** (0.023)	-0.0699*** (0.014)	-0.0522*** (0.014)
MARRIED	0.0822*** (0.018)	0.1792*** (0.019)	0.0596*** (0.016)	-0.1087*** (0.017)
PTIME	0.5700*** (0.029)	0.4456*** (0.026)	0.4063*** (0.027)	0.2743*** (0.035)
CONSTR	0.1319*** (0.024)	0.1649*** (0.030)	0.1381*** (0.046)	0.0826 (0.066)
TRNSPCOM	0.2268*** (0.038)	0.2467*** (0.035)	-0.0005 (0.041)	0.1597*** (0.049)
COMMERCE	0.0082 (0.026)	-0.0117 (0.030)	-0.2272*** (0.034)	-0.0751** (0.038)
SERVICE	0.0120 (0.023)	0.0323 (0.028)	-0.1446*** (0.022)	0.0778*** (0.027)
MANAGER	-0.3026*** (0.053)	0.0166 (0.055)	-0.0879** (0.036)	-0.1620*** (0.044)
TECH	-0.3093*** (0.075)	-0.4142*** (0.058)	-0.0623 (0.045)	-0.4202*** (0.053)
MAINREPR	-0.4144*** (0.052)	-0.5185*** (0.048)	-0.4023*** (0.039)	-0.4414*** (0.050)
OPERATOR	-0.7040*** (0.055)	-0.7235*** (0.052)	-0.4306*** (0.045)	-0.6180*** (0.045)
SALES	-0.4565*** (0.055)	-0.5413*** (0.053)	-0.2687*** (0.072)	-0.4853*** (0.065)
LABORER	-0.5843*** (0.053)	-0.6600*** (0.047)	-0.3080*** (0.043)	-0.5285*** (0.044)
$R^2$	0.2822	0.3600	0.4582	0.4733
$N$	5,185	5,497	3,274	4,186

Notes: (i) MANUFG is the reference industry category and PROF is the reference occupation.

(ii) \*, \*\*, and \*\*\* indicate the significance levels at 10, 5, and 1 percent, respectively, using two-tailed tests. Standard errors in parentheses.

**Table A2**  
**Interior Wage Function Estimates: Small and Large Firms**

Variable	Small Firms		Large Firms	
	1987	1996	1987	1996
CONSTANT	1.6968*** (0.046)	1.5958*** (0.053)	1.7146*** (0.040)	1.4698*** (0.070)
EXPER	0.0296*** (0.002)	0.0197*** (0.002)	0.0235*** (0.002)	0.0161*** (0.002)
EXPER2	-0.0426*** (0.003)	-0.0265*** (0.003)	-0.0317*** (0.003)	-0.0127*** (0.005)
SCHOOL	0.0482*** (0.002)	0.0566*** (0.002)	0.0525*** (0.002)	0.0770*** (0.003)
FEMALE	-0.2336*** (0.015)	-0.1144*** (0.015)	-0.0779*** (0.012)	-0.0866*** (0.016)
MARRIED	0.1247*** (0.014)	0.1448*** (0.014)	0.0662*** (0.012)	0.1285*** (0.017)
PTIME	0.4904*** (0.020)	0.4531*** (0.018)	0.3310*** (0.022)	0.2666*** (0.026)
CONSTR	0.0310* (0.016)	0.0932*** (0.024)	-0.0176 (0.023)	0.1488*** (0.058)
TRNSPCOM	0.1421*** (0.029)	0.1673*** (0.029)	0.0999*** (0.020)	0.1773*** (0.033)
COMMERCE	0.0135 (0.018)	0.0096 (0.020)	-0.1509*** (0.024)	-0.1398*** (0.028)
SERVICE	-0.0871*** (0.015)	0.0383** (0.018)	-0.0302** (0.015)	0.0385 (0.024)
MANAGER	-0.1377*** (0.032)	0.1752*** (0.043)	-0.0404* (0.022)	0.0311 (0.035)
TECH	-0.1900*** (0.046)	-0.4069*** (0.045)	-0.1085*** (0.027)	-0.1886*** (0.040)
MAINREPR	-0.3805*** (0.033)	-0.6006*** (0.036)	-0.2596*** (0.026)	-0.4677*** (0.043)
OPERATOR	-0.5363*** (0.036)	-0.6948*** (0.037)	-0.3306*** (0.032)	-0.5498*** (0.040)
SALES	-0.4228*** (0.035)	-0.6286*** (0.038)	-0.1765*** (0.040)	-0.4561*** (0.046)
LABORER	-0.5397*** (0.034)	-0.6451*** (0.035)	-0.3005*** (0.026)	-0.4583*** (0.035)
$R^2$	0.3061	0.3700	0.3907	0.4689
$N$	11,346	10,694	7,537	6,269

Notes: (i) MANUFG is the reference industry category and PROF is the reference occupation.

(ii) \*, \*\*, and \*\*\* indicate the significance levels at 10, 5, and 1 percent, respectively, using two-tailed tests. Standard errors in parentheses.