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**NÚMERO 129**

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**Aurora Gómez-Galvarriato**  
**WHAT DO UNIONS DO?: MEASURING THEIR IMPACT**  
**IN THE MEXICAN COTTON TEXTILE**  
**INDUSTRY, 1900-1930**

## *Introduction*

When looking at the consequences of the Mexican Revolution from the perspective of Orizaba textile mills, it is clear that its major impact was a substantial transformation in the relative power of workers and employers in determining working conditions, to the benefit of the former. From a *laissez faire* regime, where employers dealt with an unorganized labor force and wages were determined solely by the forces of supply and demand, existent by 1900, we arrive in 1925 to a totally different situation. Workers were now organized in powerful unions with an important role in the way work was carried on in the shop-floor. Labor was now hired through collective contracts negotiated between unions and employers, and it was now unions, rather than employers, who made the major hiring and firing decisions among blue-collar workers. The government, previously totally supportive of employers, became now, at the least, divided between the interests of employers and workers. While in many crucial turning points it gave decisive support to labor at the expense of company owners.

In this paper I will analyze what was the impact of such institutional changes in terms of real wages and productivity levels of textile workers at the Santa Rosa mill in Orizaba. I will also look at these issues at a national perspective in order to see how Santa Rosa's experience compares to that of the Mexican textile mills in general.

### *Changing Labor Relations.*

The transformation of the labor regime was not a result of a Revolutionary program. The Mexican Revolution, was not carried on by a single group with a defined ideology and set of goals. Thus, institutional changes in labor relations, as most other transformations the Revolution brought about, were not a planned result of some Revolutionary entity that was pursuing some objectives it had previously defined. They came as an unplanned by-product of the Revolution. After the fall of Díaz in 1911 Mexican governments became weaker and weaker until 1916, when Carranza began to gradually rebuild government's strength, but it was not until the late 20's or early 30's that we can talk of a government as strong as that of Díaz, and then it was set over the support of a very different array of political groups.

As I see it from the study of the Orizaba textile industry, the transformation in the labor regime came as a result of the combination of (1) weaker governments that opened space for the labor movement to organize and act, and (2) the need of those groups seeking to establish themselves as

governments to co-opt the labor movement, whose support had become necessary to reestablish peace.<sup>1</sup>

“Capitalists continually “vote” for allocation of societal resources as they decide to invest or not, to employ or dismiss labor, to purchase state obligations, to export or import. By contrast, workers can process their claims only collectively and only indirectly, through organizations which are embedded in systems of representation, principally trade-unions and political parties.”<sup>2</sup> As Mexican workers organized, they acquired the possibility of processing their claims, and count as political actors. Policies-and the state itself- expressed, as a consequence of a stronger labor organization, a new compromise between the interests of capitalists and organized workers.

Traditional historiography identifies article 123 of the new Constitution of 1917 as the major turning point in labor relations and working conditions for industrial workers. It was, in fact, one of the most progressive legal codes of its times, granting the right to strike, legalizing trade unions, forbidding child labor, establishing pregnancy leaves, setting the daily shift to a maximum of eight hours, establishing employers' responsibility on workers' injuries and diseases, and opening the possibility of collective contracts. Yet, in the case of industrial workers of Veracruz, and perhaps also in different degrees in some other states such as Puebla, Tlaxcala, the State of Mexico, and Mexico City, this code only crystallized gains that had already been obtained in the previous decade. In those areas where the labor movement was strong, it basically only gave legal support to an already existent situation. In those regions where there was no strong labor movement to make the precepts of Article 123 be complied with, they rested for decades as an ideal very far away from daily practice.

In the Orizaba valley the labor movement grew stronger as a consequence of the Revolution. Yet, it was by no means a product of it. Textile workers from the Orizaba mills began to organize and change their working conditions many years before Porfirio Díaz was deposed. Plenty of letters sent by several of them to “El Paladín”, a radical newspaper from Mexico City, in which they severely complained about the unfair ways textile mills related to them, are the best testimony of it.<sup>3</sup> Furthermore, they built by 1906 a very powerful trade union the Gran Liga de Obreros Libres (CGOL) that in a very short time had branch organizations in the states of Jalisco, Oaxaca, Tlaxcala, Mexico, the Federal District, Querétaro and Hidalgo, in addition to Veracruz and Puebla, the two states in which the movement began.<sup>4</sup>

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<sup>1</sup> These issues are discussed with greater depth in Aurora Gómez-Galvarriato, doctoral dissertation in process, Harvard University.

<sup>2</sup> Przeworski, Adam, *Capitalism and Social Democracy*: 11.

<sup>3</sup> *El Paladín*, “Orizaba al Vuelo y sus Alrededores”, January 1906-December 1908.

<sup>4</sup> Ruth Clark, *Organized Labor*: 12-13 and Rodney Anderson, *Outcasts in Their Own Land*: 128-150

The government and the textile companies felt so threatened by the CGOL that they opposed with all force the first general strike it supported. This strike broke in Puebla in November 1906 against new factory regulations established by the new Centro Industrial Mexicano. It was not the first strike to take place in textile mills. However, it was the first in which there was a network of support that channeled funds to strikers that made them stronger in their claims. Textile companies decided, with the support of the government, to carry on a general lockout in textile mills throughout the country, in order to disable fellow workers in the CGOL to support Puebla strikers.<sup>5</sup> The massacre of Río Blanco in January 1907 was an unforeseen consequence of this policy as workers in anger, after several weeks without payment, rioted the regions' stores and federal troops crushed them.

The CGOL was disbanded and its major leaders arrested, but workers, at least in the Orizaba valley, kept organized. In May 1907 workers from the Compañía Industrial de Orizaba went into strike in order to reduce their working hours, and in August 1910 Santa Rosa workers followed suit. They won, and the shift was cut from twelve to eleven hours. This was the first of a series of reductions in the hours of work that took place in the following years (See Table 1). After January 1907 company stores in the region stopped operating as they previously did, at first the commission charged by the mills to the stores on workers' purchases was eliminated, and by 1908 companies ended the practice of deducting directly from workers' wages their debts with the stores.<sup>6</sup> Furthermore, in the aftermath of the January 1907 massacre, millhands in the Orizaba valley received a 10% wage increase and the hated fines ended.<sup>7</sup>

During the Porfiriato, levying monetary penalties upon workers who misbehaved was a regular practice used to impose discipline at the shop-floor. Workers considered them arbitrary and unfair. "It seems that a private tribunal has been established" in the mill, Río Blanco workers complained.<sup>8</sup> According to Santa Rosa reporters in the engraving department they worked under a penitentiary regime: "To those who talk with a peer: a fine and *verdura*; to those who laugh: a fine, to those who stand up from their seat to loosen up: a storm of insults, and whom does not flatter [the supervisor] can start packing his *petates*".<sup>9</sup> From a February 1906 weekly payroll we know that 45% of all workers were fined. On average fines represented 3% of workers' wages, but in some instances they reached up to 38% of it. Santa Rosa workers reported that fines were prohibited after the sad events of January 1907.<sup>10</sup> In fact, after

<sup>5</sup> CIVSA (henceforth CV), Actas del Consejo (henceforth AC), November 30, 1906.

<sup>6</sup> CV, Copiadores de Cartas (henceforth CR), Board of Directors to Santa Rosa manager, January 12, 1907 and CV, Payrolls, 1907, 1908.

<sup>7</sup> CV, CR, Santa Rosa to Board of Directors, February 7, 1907.

<sup>8</sup> *El Paladín*, "Orizaba al Vuelo y sus Alrededores", June 21, 1906.

<sup>9</sup> *Ibid*, March 11, 1906.

<sup>10</sup> *Ibid*, August 13, 1908.

February 1907 fines disappear from Santa Rosa's payrolls.<sup>11</sup> Thus, already during the Porfiriato, although at a high cost, workers from the Orizaba valley had obtained some gains in their working conditions.

**Table 1. Workday Changes in CIVSA and CIDOSA: 1900-1917**

Hours From	Hours To	CIDOSA	CIVSA	Cause
12	11	June 17, 1907	August 1910	Strikes: CIDOSA, May 2-23 1907 and May 30-June 7, 1907 CIVSA, August 10-16, 1910
11	10	January 22, 1912	September 1, 1912	General strike, January 1-19, 1912 Agreement between workers, employers and the Department of Labor in January 20, 1912. In CIVSA the implementation of the new working schedule came after a strike from July 3-22, 1912.
10	9	August 19, 1915	August 24, 1915	Decree No. 11 of Governor of Veracruz, Cándido Aguilar. October 19, 1914. Put in practice a year later, after workers' demands.
9	8	May 1, 1917	May 1, 1917	Article 123 of the Constitution February 5, 1915. Put in practice after negotiations between companies and unions.

Source: CIVSA and CIDOSA documents.

However, more substantial gains were yet to come. After Madero became President of the Republic its government created a Department of Labor in order to deal with labor unrest that grew everyday more troublesome.<sup>12</sup> It sought to become a mediator that would ease negotiations between labor and capital and dissolve conflict. Porfirio Díaz had intervened as mediator in capital-labor conflicts when asked to act as such by the disputant parties.<sup>13</sup> Yet, during his regime, it was not considered a government responsibility to endeavor that role nor was there any official agency devoted to it. The Department of Labor marked a turning point in Mexican government's involvement in capital-labor relations. It acquired since then, the right and responsibility to act as mediator and intervene in the settling of arrangements between workers and employers.

The creation of the Department of Labor was more a reaction to the threat that the labor movement posed to stability, than a gratuity the government wanted to give to workers. One of its first challenges was negotiating the end of a general strike in the textile industry that broke in December 1911. The

<sup>11</sup> CV, Payrolls, Week 6, 1906 and Week 7, 1907.

<sup>12</sup> Decreto por el que se Establece el Departamento del Trabajo, Diario Oficial de la Federación, December 18, 1911.

<sup>13</sup> This was the case for example in the December 1906 textile mills' lockout. Anderson, *op.cit.*: 9

organization of the first textile industrialists convention in July of that year, together with a reduction of the working shift and a 10% wage increase, came as one of the compromises to end that strike. In that convention representatives of workers and employers of several mills negotiated a wage schedule and a set of rules meant to be applied in every mill.<sup>14</sup>

After Huerta's coup d'état revolutionary armies began to fight to gain control of strategic regions of the country, that would enable them to expand from them to become national government. The corridor that goes from the port of Veracruz to Mexico City was a crucial piece of the nation to have. It was the main commercial route that linked the capital to foreign nations, and the port of Veracruz collected the major share of import and export duties, a substantial share of Mexico's fiscal income. The labor movement most important clusters were precisely located along this corridor, textile workers being the largest organized group in it.

Industrial workers played a minor role as soldiers in revolutionary armies. They kept working in the mills as very few of them closed their doors. Yet, they became a group able to pose a serious threat to stability, and thus governments in power did their best to have them on their side. Governments' weakness made them unable to support companies against unions, even if they were willing to do it. In June 1919, for example, CIVSA's director complained to governor of Veracruz Armando Deschamps about the union's pretensions of ruling over the masters of the different mill departments. He offered his help to attenuate union's demands "unfortunately", said a company letter, "his authority is very reduced, given the lack of troops in the region, and being afraid that workers join the mass of revolutionaries that are almost at the factories' doors".<sup>15</sup>

The strategic military importance of Orizaba workers showed its value in the delahuertista revolt against Obregón. Orizaba textile workers in arms were crucial in gaining back the government's control over that region in February 1924. This helped to accrue the unions' power. When the rebellion was crushed, unions expelled several workers and employees from the mills claiming they had been supportive of de la Huerta, against the opposition of companies who were unable to do anything about it.<sup>16</sup>

The decrees No. 7 and 11 of governor Cándido Aguilar passed in 1914, that made rest obligatory on Sunday, reduced the workday, established a double pay for night work and forced owners to provide medical assistance and pay to sick and injured workers, among other things, are good examples of how far

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<sup>14</sup> AGN, Department of Labor (henceforth DT), (box /file) 24/1, 24/2, 8/2, 17/6.

<sup>15</sup> CV, CR, Board of Directors to Comité Consultatif de Paris, June 25, 1919.

<sup>16</sup> *Ibid*: February 5, 1924, February 23, 1924 and April 12, 1924.

governments were willing to go in order to obtain labor support<sup>17</sup>. Government's ability to implement the new laws was much more limited. The government left in the hands of workers the task of looking for the new laws to be complied with. Thus, for example, the shift reduction from ten to nine hours, established by the October 1914 decree, was not carried on in Orizaba until a year later after several workers' protests (see Table 1).

Municipal presidents of the several mill towns in the Orizaba valley had always been factory employees. This gave companies a powerful say on the way policy was carried on in these towns. In 1906, a letter of Santa Rosa workers to "El Paladín" expressed that the fact the Municipal President was an employee of the factory meant "including justice in the company's inventory and making the authority a blind instrument to shut down the voice of those workers who had the energy to complain against daily abuses."<sup>18</sup> It was an easy and normal procedure for company managers to imprison workers with no legal basis, as happened in June 1906 to five workers. They had been appointed by their fellows from the Santa Rosa spinning department, to complain to the manager about the bad quality of the raw cotton they were supplied to work with. Instead of being listened, they were sent into prison.<sup>19</sup> With the authorities support it was easy for companies to imprison immediately anyone suspicious of stealing pieces of cloth.<sup>20</sup>

This situation turned around 180 degrees some time between 1914 and 1918 as all Municipal Presidents were since then blue collar workers.<sup>21</sup> Now those who complained were company owners and managers. Municipal Presidents became the first step to deal with labor-capital disputes and according to CIVSA directors "in Santa Rosa he is nothing but the mannequin of labor unions, and in consequence we will never gain any cause."<sup>22</sup> In 1918 CIVSA managers complained that Municipal Presidents, as part of the Local Juntas de Conciliación y Arbitraje, would always bias the Junta decisions in favor of workers.<sup>23</sup> After 1916, CIVSA constantly complained about the increase in thefts in the mill and its inability to do anything about it, since as CIVSA board of directors explained: "we have a weaver as a City Major and

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<sup>17</sup> Ley Sobre Descanso Dominical en el Estado de Veracruz, Decreto No.7, Gaceta Oficial del Estado de Veracruz, October 4, 1914, Ley de Cándido Aguilar, Gaceta Oficial del Estado de Veracruz, Decreto No. 11, October 29, 1914.

<sup>18</sup> *El Paladín*, "Orizaba al Vuelo y sus Alrededores", January 18, 1906.

<sup>19</sup> *Ibid*, June 10, 1906.

<sup>20</sup> *Ibid*, February 6, 1906.

<sup>21</sup> All Municipal Presidents of Santa Rosa from 1918 to 1958 were workers of the Santa Rosa Mill. Sindicato de Trabajadores en General de la Compañía Industrial Veracruzana S.A. "Bodas de Oro", (Ciudad Mendoza *Pro-Paria*, 1965): 46

<sup>22</sup> CV, CR, Board of Directors to Comité Consultatif de Paris, July 28, 1917.

<sup>23</sup> CV, CR, Santa Rosa manager to the Board of Directors in Mexico City, September 12, 1918.

one gendarme as all police, it is not by respect to these authorities that workers will stop stealing.<sup>24</sup>

On December 1915 provisional governor of Veracruz, Agustín Millán passed a Law of Professional Associations that legalized unions, establishing that they had to register communicating to the Juntas de Administración Civil their objectives, their means of obtaining resources, the use they would give them, the conditions of admission and separation of its members and the way its directives were chosen. They should render a biannual report of their financial operations.<sup>25</sup> This law was passed again, basically with the same words, by governor Cándido Aguilar when he retook the governorship a month later.<sup>26</sup>

In early 1916, before Orizaba unions were completely legal under the former laws, they took a decisive step into gaining control over hiring and firing workers. An agreement signed by the Orizaba unions, the industrial companies' managers and Cándido Aguilar, gave unionized workers preference to cover vacancies, and power to fire those workers unwilling to become union members. It also established that no worker could be fired without a justified cause. In case of conflict the Arbitrage Committee had to make a decision. It was formed by the Secretary General of the Union, the Factory manager and the Inspector of the Labor Law.<sup>27</sup> In practice, according to CIVSA directors, it meant that in order to fire any worker, they had to pay him a three months wage liquidation fee.<sup>28</sup> After that agreement, day workers became syndicalized and hired under a collective contract. In October 1919, after a long strike, night workers also acquired this status.<sup>29</sup>

All these brought fundamental changes in working conditions at the shop-floor.<sup>30</sup> If during the Porfiriato it was very common for foremen to exercise physical violence against workers, as the numerous letters published in "El Paladín"<sup>31</sup> report, later it became impossible, and the opposite became sometimes true. In June 1917 CIVSA's manager Mr. Mauré was hit in the face by a bolt thrown at him by a worker when passing by the weaving hall. This was not an isolated case, there were several reports of workers from the spinning and weaving departments throwing bobbins to the departments' directors. However

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<sup>24</sup> CV, CR, Board of Directors to Comité Consultatif de Paris, December 5, 1916.

<sup>25</sup> Ley de Asociaciones Profesionales de Agustín Millán, Decreto No. 45, Gaceta Oficial del Edo. de Veracruz, December 14, 1915.

<sup>26</sup> Ley de Asociaciones Profesionales de Cándido Aguilar, Decreto No.15, Gaceta Oficial del Edo. de Veracruz, February 8, 1916.

<sup>27</sup> CV, CR, Santa Rosa manager to the Board of Directors in Mexico City, January 18, 1916.

<sup>28</sup> CV, CR, Board of Directors to Comité Consultatif de Paris, June 10, 1916.

<sup>29</sup> *Ibid*: October 23, 1919,

<sup>30</sup> See Jeffrey Borzt, "Without any more Law than their Own Caprice" Cotton textile Workers and the Challenge to Factory Authority during the Mexican Revolution", *International Review of Social History*, 1997-2.

<sup>31</sup> See for example *El Paladín*, "Orizaba al Vuelo y sus Alrededores", March 1, 1906, January 19, 1908, August 9, 1908, September 10, 1908,



this time the situation was graver since it dealt with the company's general director. CIVSA asked the union directives and local authorities to find the guilty or else they would close the factory. The factory closed for twelve days but the worker who hit Mr. Mauré was never found.<sup>32</sup>

All these gives an idea of how the labor movement had grown strong and how it had transformed labor relations between labor and employers. I will explore in the rest of the paper what were the effects of these changes in CIVSA workers' real wages, and productivity levels.

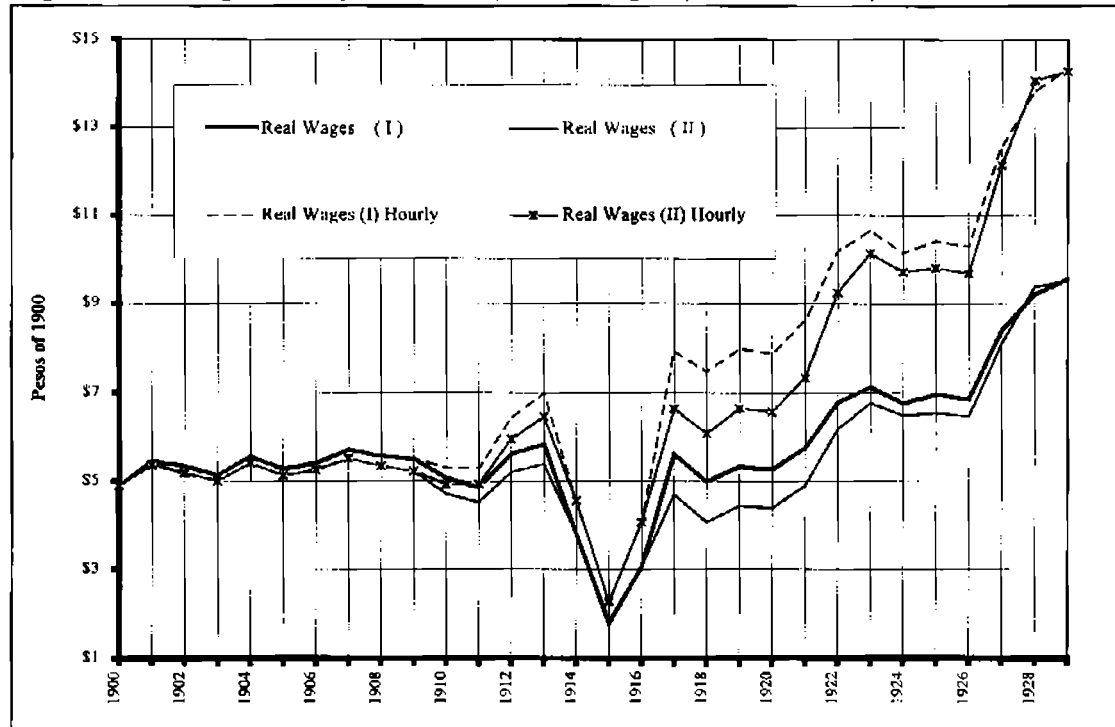
### ***The Evolution of Real Wages: 1900-1929***

A general outlook of the impact of the Revolution in CIVSA real wages can be seen in Figure 1.<sup>33</sup> From a long run perspective real wages during the last decade of the Porfiriato appear relatively stable. From 1900 to 1910 nominal wages rose by 41% and real wages grew by 3.7%. There were two cycles, from 1900 to 1907 real wages increased by 17%, then from 1907 to 1911 they decreased by 15%. Most of this fall took place between 1909 and 1910, mainly as a consequence of the greater inflation of these years. The general trend of CIVSA real wages for the Porfiriato can be safely generalized for industrial workers of at least the central region of Mexico since its evolution is not so much depicted by the changes in CIVSA's nominal wages, but by the price index which does not rise by much. If wages did not decline in the other industrial sectors but remained relatively constant, then prices would not have deteriorated by much their real value.

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<sup>32</sup> CV, AC, June 12 and 19, 1917.

<sup>33</sup> In order to compare real wages over the whole period, I joined the price indices that go from 1900 to 1913 with those from 1917 to 1929 by establishing a common basket. Then, I filled the gap between the two periods with the figures for wages in gold pesos. The methodology used is explained in Aurora Gómez Galvarriato and Aldo Musacchio "Un Nuevo Índice de Precios para México 1886-1930" CIDE, División de Economía, Documento de Trabajo No 113, 1998.

**Figure 1. Average Weekly and Hourly Real Wages (Pesos of 1900)**

(I) Wages deflated with the Consumer Price Index including all items.

(II) Wages deflated with the Consumer Price Index without CIVSA's rent and electric light.

\* From 1914 to 1915 I used the gold value of wages as a proxy for the real wages. Real wage per hour takes into account changes in the length of the workday: 12 hours from January 1900 to July 1910, 11 hours from August 1910 to August 1912, 10 hours from September 1912 to July 1915, 9 hours from August 1915 to April 1917 and 8 hours from May 1917 on.

For a detailed explanation of sources used and the methodology followed see: Aurora Gómez Galvarriato and Aldo Musacchio, "Un Nuevo Índice de Precios para México", CIDE, División de Economía, Documento de Trabajo No. 113.

During the first years of the Revolution, before the fall of Francisco I. Madero, real wages at CIVSA increased. This was the result of the surge of the labor movement and the support the new government gave it through the Department of Labor. The minimum tariff for the textile industry negotiated in the Convention of Industrialists of July 1912 was the most distilled result of this process. From 1911 to 1913 real wages grew by 20%, redressing the previous loss in workers' purchasing power. In 1913 real wages were 2.1% above their highest point in 1907 (see Figure 1). Wages per hour increased even more (32%) since the shift was reduced from 12 to 10 hours. It is probable that real wages increased even more in most textile mills, since Santa Rosa wages were already high before the setting of the tariff. Those factories that had lower wages previously to that year must have increased wages by a greater amount.

After Huerta seized power, and war took greater proportions, political chaos gave way to monetary anarchy, and this brought about hyperinflation.

Inflation eroded nominal wage increases from 1914 to 1916 causing an impressive decline in workers purchasing power which fell to its worst point in May 1916 to a seventh of what it used to be in 1912 in terms of gold pesos. Given that Figure 1 shows annual averages of real wages it underestimates their collapse during the worst months of 1914-1916. Yet, it appears enormous compared to any other fall in real wages during these three decades.

We can be fairly sure that workers real wages in general, faced an impressive decline during this period. We could think that the deterioration of real wages in general could have been even greater than that evidenced for CIVSA. Inflation lowered real wages by a tremendous amount, which CIVSA workers were, to a certain extent, able to check with their several strikes. Other workers who did not have such a powerful labor movement would have experienced a further deterioration of their real wages. However we know that CIVSA workers were not alone in their strikes, but that they were part of a broader labor movement that organized and coordinated workers of several trades and industries to strikes from several regions of central Mexico. At the same time, we could think that workers who faced subsistence wages previously to 1914 could not have experienced such a dramatic fall in their wages. Those workers who received some part of their payments in-kind had that part of their wages, by its own nature, safeguarded from inflation.

The high inflationary levels of 1915 and 1916 must have been in themselves an important factor in giving strength to the labor movement. It gave workers an immediate and relevant motive to unite and to fight. In CIVSA most of the strikes made in this period were highly effective which would have given great prestige to the union among the mass of workers.

After the recovery of real wages in December 1916 when finally CIVSA workers won the fight to be paid in gold pesos, real wages began to fall due to the new price increase that was taking place in 1917. A new strike in May 1917 generated an important nominal wage increase that increased real wages to unprecedented values. Yet, inflation soon diminished real wages to practically the same level they had at the beginning of the year.

In general terms, from 1917 to 1920 workers were able to regain the real wage they earned in 1913 (see Figure 1), which was lost during the inflationary period that went from 1914 to 1916. Yet it was not very different from the real wage earned in 1907, since the real wage improvement achieved between 1912-1913 only compensated for the real wage loss that took place between 1908 and 1911. However workers earned this wage in an 8 hour instead of a 12 hour shift, a major gain.

From 1920 to 1929 wage increases, coupled with price deflation, increased Santa Rosa workers purchasing power by an impressive 131%. It is in this period that workers saw a substantial improvement from the living standards they had in 1907 or 1913. Furthermore, the labor laws of Veracruz of 1914 and 1915 and the Constitution of 1917 had brought other non wage

benefits to workers such as sickness and accident compensations and retirement pensions which CIVSA directors valued as an additional 15% increase to wages.<sup>34</sup>

The Revolution certainly contributed to the growth of the labor movement and the speed and depth of its gains. Yet, by no means can we conclude that if the Revolution had not occurred, workers had not organized, and these gains would not have taken place anyway. A comparative study with other Latin American countries could help us clarify this counterfactual.

### ***A Growing Regional Wage Disparity.***

CIVSA's real wage increase from 1917 to 1929 cannot be generalized to other industries or regions. Textile mills in other states increased their wages by a much lower rate. In fact the wage gap between regions grew in the 20's relative to its size in Porfirian times as a result of the different regional strength of the labor movement. The variance of average wages in different states that was of 0.015 in 1893, grew to 0.24 in 1925.<sup>35</sup>

Economic theory suggests a close relationship between labor productivity and wages when labor markets act freely. In 1893-96 there existed a strong relationship between these two variables. In Figure 2 we can see how data depicts an almost perfect diagonal of 45 degrees. The correlation between labor efficiency<sup>36</sup> and average wage was of 0.57.

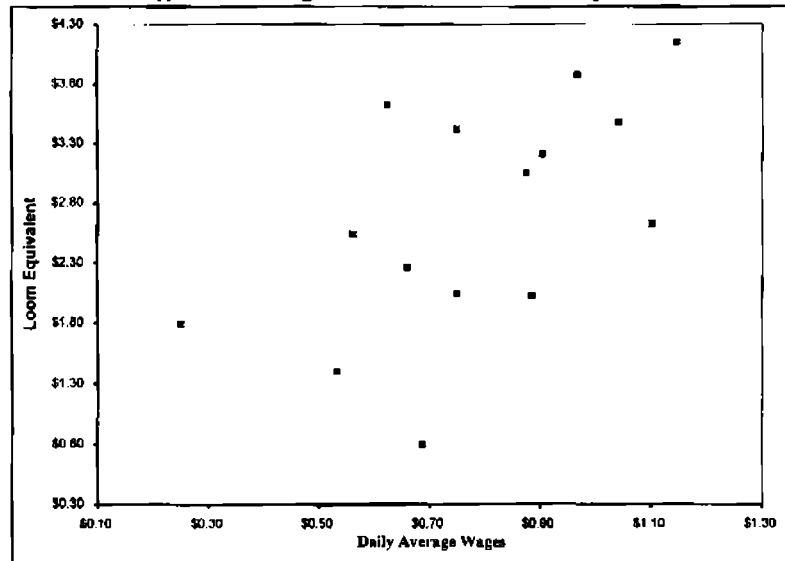
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<sup>34</sup> CV, CR, J. Michel to the Comité Consultatif in Paris, April 30, 1917.

<sup>35</sup> For these correlations data per state were taken from: México Dirección General de Estadística. *Anuario Estadístico de 1893*, and México, Secretaría de Hacienda y Crédito Público (SHCP), Departamento de Impuestos Especiales, Sección de Hilados y Tejidos, Cuadro No.1, semestre del 1º de mayo al 31 de octubre de 1925.

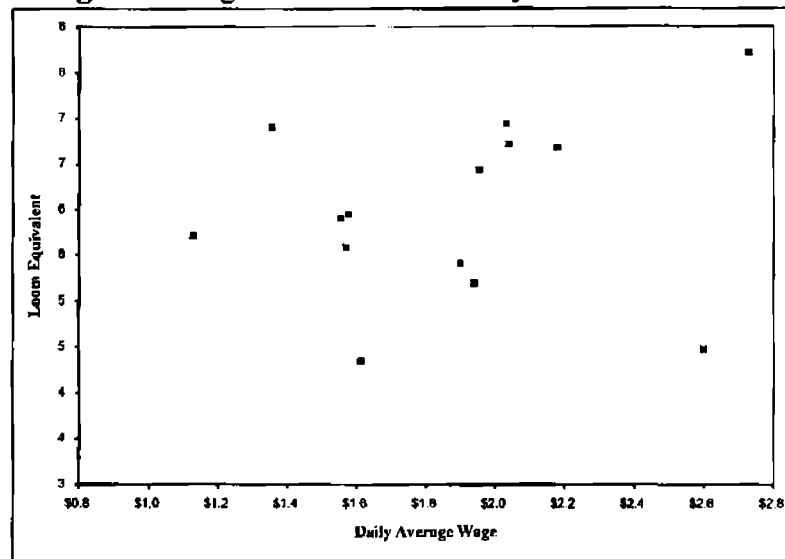
<sup>36</sup> Labor efficiency refers to the number of machines that each worker tended. It is an index constructed by giving looms a weight of 1 and spindles a weight of 0.011 (I am assuming they were ring spindles). This corresponds to the relative numbers of workers needed to man weaving sheds and ring spinning mills in Britain in 1910. The index is adjusted to a per-shift basis considering a 12 hour shift for 1893 an 8 hour shift for 1925 and a 55 hour week as a common basis for comparison. These calculations replicate the technique followed in Gregory Clark, "Why Isn't the Whole World Developed? Lessons from the Cotton Mills". For these correlations data for looms, spindles and workers per state were taken from: México Dirección General de Estadística. *Anuario Estadístico de 1893*, and, México, SHCP, Departamento de Impuestos Especiales, Sección de Hilados y Tejidos, Cuadro No.1, semestre del 1º de mayo al 31 de octubre de 1925, respectively for 1893 and 1925. Data for wages come from U.S.A., Special Consular Reports, *Money and prices in Foreign Countries*, 1896 and, México, Secretaría de la Economía Nacional [Moisés T. de la Peña], *La Industria Textil en México. El Problema Obrero y los Problemas Económicos*, respectively for 1896 and 1923.

**Figure 2. Wage Vs. Labor Efficiency 1893**



Sources: México Dirección General de Estadística. *Anuario Estadístico de 1893*. México, 1894, and U.S.A, Special Consular Reports, *Money and prices in Foreign Countries*, Washington: Government Printing Office, 1896.

**Figure 3. Wage Vs. Labor Efficiency 1923**

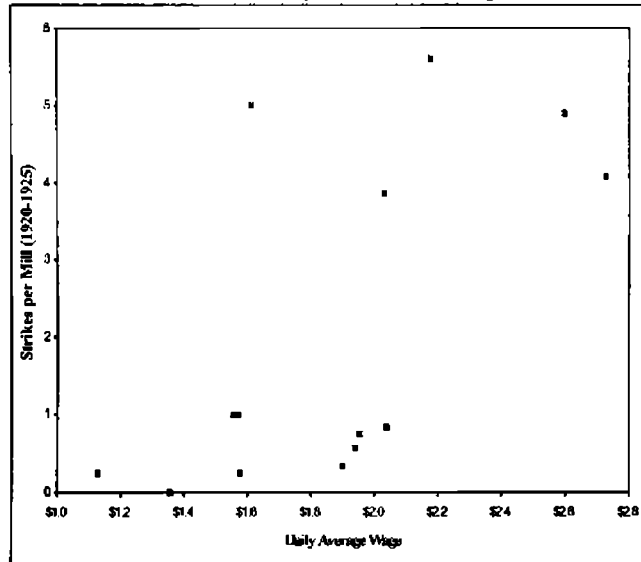


Sources: México, SHCP, Departamento de Impuestos Especiales, *Estadística del Ramo de Hilados y Tejidos de Algodón y de Lana Correspondiente al Semestre del 10 de Mayo al 31 de Octubre de 1925*, and México, Secretaría de la Economía Nacional [Moisés T. de la Peña], *La Industria Textil en México. El Problema Obrero y los Problemas Económicos*.

In 1923-25, in contrast, that relationship is less clear. In Figure 3 we can see how data is more dispersed and it is difficult to find the diagonal that we saw

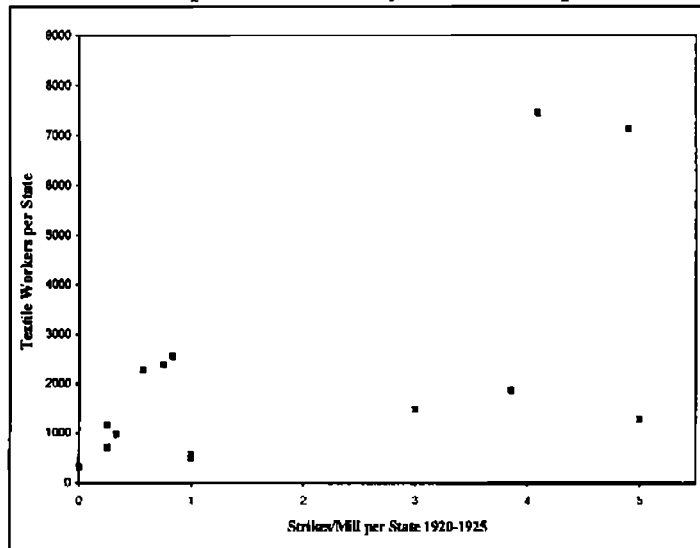
for 1893-96. The correlation between labor efficiency and wages for 1923-25 was only of 0.21.

**Figure 4. Textile Workers Wage Vs. Strikes per State 1920-1924**



Sources: México, Secretaría de la Economía Nacional, [Moisés T. De la Peña], *La Industria Textil en México. El Problema Obrero y los Problemas Económicos*: 22, 29-35

**Figure 5. Textile Workers Population Density Vs. Strikes per State 1920-1924**



Sources: México, Secretaría de la Economía Nacional, *La Industria Textil en México. El Problema Obrero y los Problemas Económicos*: 14, 29-35 and 126; México, INEGI, *Estadísticas Históricas de México*: 11-21.

The dispersion of regional wages in the 20s, is much better explained by the strength of the labor movement in each state than by its efficiency. The correlation between the number of strikes in each state in the period 1920-24 and the average wage is of 0.61. In Figure 4 we can see the diagonal that we could not find in the previous graph.

Figure 5 shows how the number of strikes in the textile industry is directly related with the population density of textile industrial workers in each state. There is a better correlation between the number of strikes in each state and the number of textile workers in the region (0.74), than between the number of strikes and the average number of workers per mill in the state (0.57). There also exists a greater correlation between the number of strikes and the number of spindles per state (0.72), than between the number of strikes and the average number of spindles per factory in the state (0.49). This implies that labor movements grew stronger and were more capable of imposing higher wages in those states that had a greater number of textile workers and bigger mills. Yet, it was more important to have more textile workers than bigger mills. A small factory in Veracruz would have higher wages than a big mill in Jalisco. Yet, factory size was also important, Puebla was the state with more spindles, however, Veracruz and the D.F., regions with bigger mills, had higher wages.

Between 1925 and 1927 a major Convention between workers and industrialists of the textile industry took place in order to ease labor-capital troubles by producing an uniform tariff and set of rules, as the Convention of 1912 had done. However it could not fulfill this objective. The variance of wages between states grew from 0.24 in 1925, to 0.37 in 1929.<sup>37</sup>

The wage schedule established by the Convention, if implemented strictly, would have put several mills in a terrible situation. Its flexibility meant that important wage gaps continued to exist. In fact it was the different regional strength of the labor movement that had in the first place widened the wage gap between regions, that continued opening it up, since it was in those states where it was strong that the convention regulations were applied. This situation, left Veracruz in a bad standing relative to other states for the development of its textile industry. Nonetheless, wages in other regions also increased. On average real wages increased through this period in the whole country. From 1925 to 1929 the average national real wage increased by between 40% and 50%. However, this wage increase came coupled by a fall in employment of nearly 10%. This can be explained by the fact that if unions and government fixed wages over the equilibrium given by supply and demand, then necessarily employment would fall.

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<sup>37</sup> Variance of wages of male, female and children weighted by the percentage of employment of each of these kinds, listed in México, SHCP, Departamento de Impuestos Especiales, Sección de Hilados y Tejidos, Cuadro No.1, semestre del 1º de mayo al 31 de octubre de 1925 and semestre del 1º de mayo al 31 de octubre de 1929.

**Table 2.** Change in Wages and Employment: 1925-1929

States	Nominal	Real Wage (I)	Real Wage (II)	No. of Workers	Hours Worked
Distrito Federal	18.1%	33.2%	42.4%	-21.1%	9.6%
Guanajuato	16.6%	31.5%	40.6%	40.2%	-10.5%
Hidalgo	47.3%	66.1%	77.5%	-26.0%	9.7%
México	15.4%	30.2%	39.1%	2.3%	4.4%
Querétaro	7.7%	21.5%	29.8%	16.7%	89.3%
Puebla	18.6%	33.8%	43.0%	-14.8%	-4.7%
Tlaxcala	48.5%	67.5%	79.1%	-7.7%	-9.6%
Coahuila	12.3%	26.7%	35.4%	5.6%	17.7%
Chihuahua	27.9%	44.3%	54.2%	46.2%	87.7%
Nuevo León	26.7%	42.9%	52.8%	8.4%	-21.8%
Veracruz	28.7%	45.2%	55.2%	-8.8%	-22.4%
Guerrero	44.9%	63.4%	74.7%	43.8%	-42.0%
Oaxaca	45.8%	64.4%	75.8%	63.9%	-3.5%
Jalisco	-6.7%	5.2%	12.4%	-10.6%	1.8%
Michoacán	-2.6%	9.9%	17.5%	-5.5%	-37.1%
Nayarit	52.4%	71.9%	83.7%	-13.0%	-30.3%
Durango	18.5%	33.7%	42.9%	-62.9%	-35.4%
Sinaloa	2.9%	16.0%	24.0%	-0.6%	-10.0%
Sonora	90.7%	115.1%	130.0%	36.0%	6.2%
Total	24.7%	40.6%	50.3%	-9.9%	-3.4%

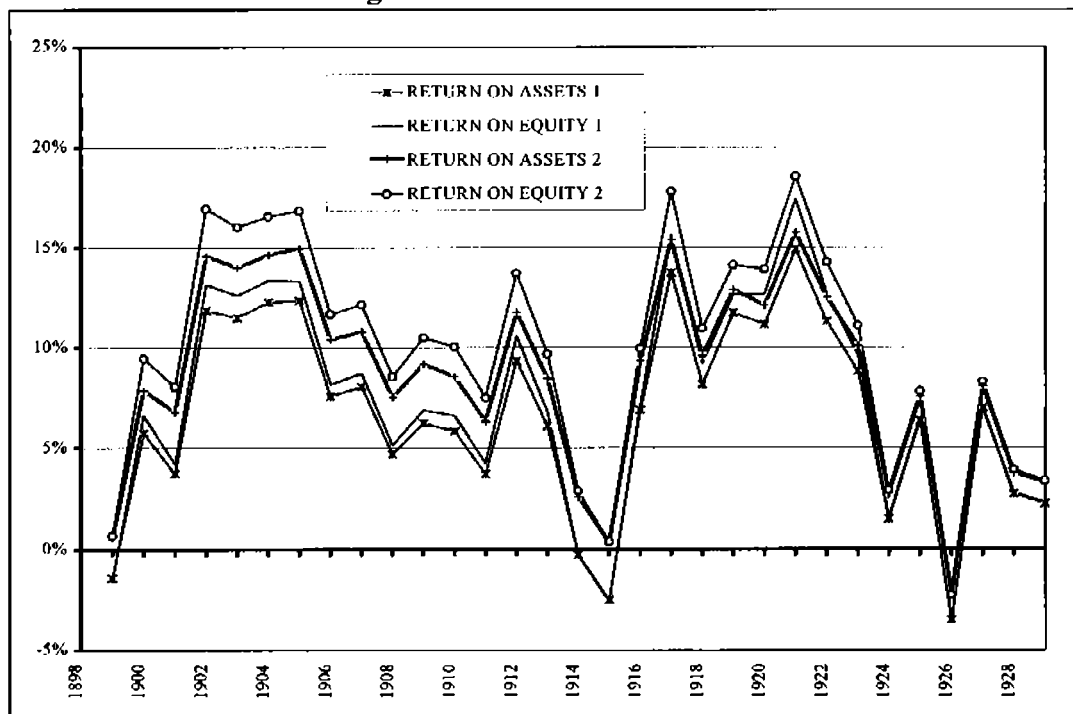
Source: México Dirección General de Estadística. *Anuario Estadístico de 1893*, and México, SHCP, Departamento de Impuestos Especiales, *Estadística del Ramo de Hilados y Tejidos de Algodón y de Lana*, 1925-30.



### *The Evolution of Productivity Levels.*

Unfortunately the Revolution had other consequences that were only going to become evident in the long run. Although profit rates regained their Porfirian levels in the twenties before they were hit by the preamble of the Great Depression, the value of Santa Rosa and other textile mills company stock never fully recovered, showing the deterioration in business perspectives (see Figures 6 and 7). Investment collapsed during the Revolution, as can be seen in Figure 8 and remained low in the twenties. CIVSA entrepreneurs appear to have followed the strategy of eating up the fixed capital already invested. In order to take advantage of the lower wages and weaker labor movement in Puebla they bought a small mill in that state, El León.<sup>38</sup>

**Figure 6. Profit Rates at CIVSA**



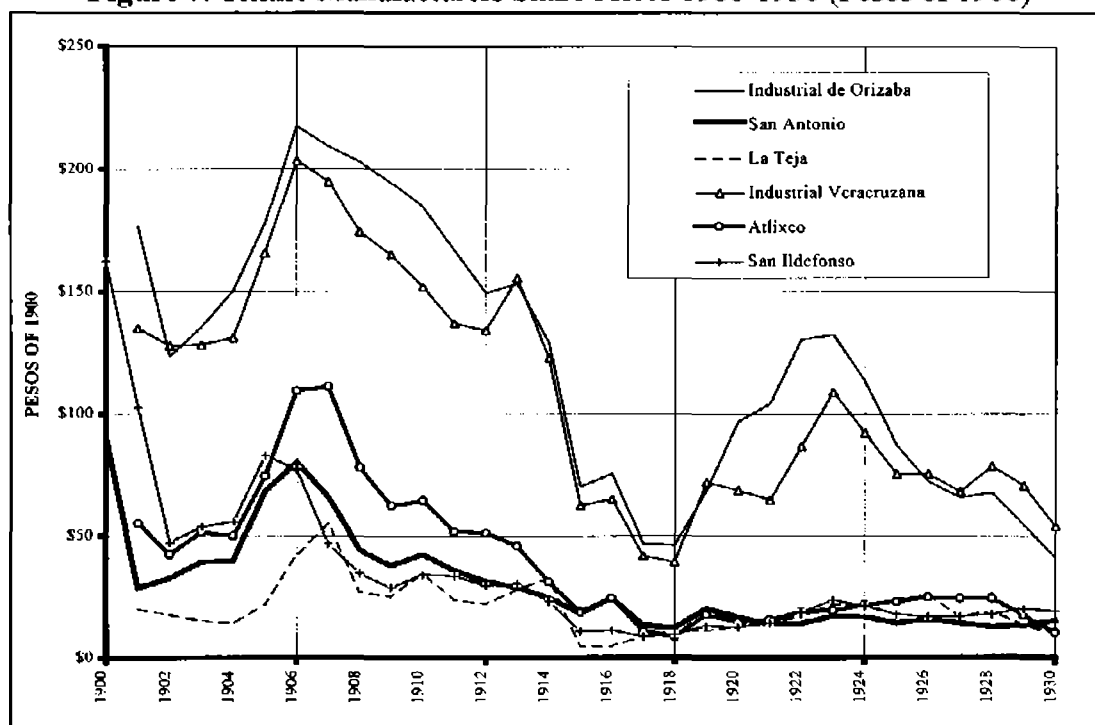
Source: CIVSA Shareholders Annual Meeting Minutes and Balance Sheet, 1899-1929.

It is difficult to discern how much of the lack of investment and technological retardation was caused by the uncertainty and the collapse of financial markets the Mexican Revolution brought about, how much by the new economic world wide conditions, and how much by the new strength of the labor movement. Furthermore, given that in Mexico the Revolution came about

<sup>38</sup> This is what explains the relatively high investment of 1921 shown in Figure 14. But they did not carry on further investments in order to modernize the old machinery of that mill.

together with a strengthening of the labor movement, it is impossible to separate their effects as independent processes.

**Figure 7. Textile Manufacturers Share Prices 1900-1930 (Pesos of 1900)**



Sources: *El Economista Mexicano* 1900-1915, *El Democrata* 1916, and *Boletín Financiero y Minero* 1918-1930.

Productivity levels measured as machine per worker and production per worker remained stagnant throughout these three decades (See Table 3 and 4). Given the radical change experienced at the shop-floor from manager's to union's control, it could seem surprising that productivity levels did not fall as a consequence of the Revolution.

This means that Santa Rosa union was effective at guaranteeing workers' discipline and effort. Moreover, workers were able to produce more per hour as the shift was reduced, despite of the fact that they were doing their tasks with basically the same machinery they worked with during the Porfiriato. This means that the intensity of labor was higher during the shorter working day, perhaps because workers were not as tired, and since they were paid per piece, they tried to get as much done as their strength allowed them. In addition, once the shift was reduced, companies became more strict upon entrance and exit hours.<sup>39</sup>

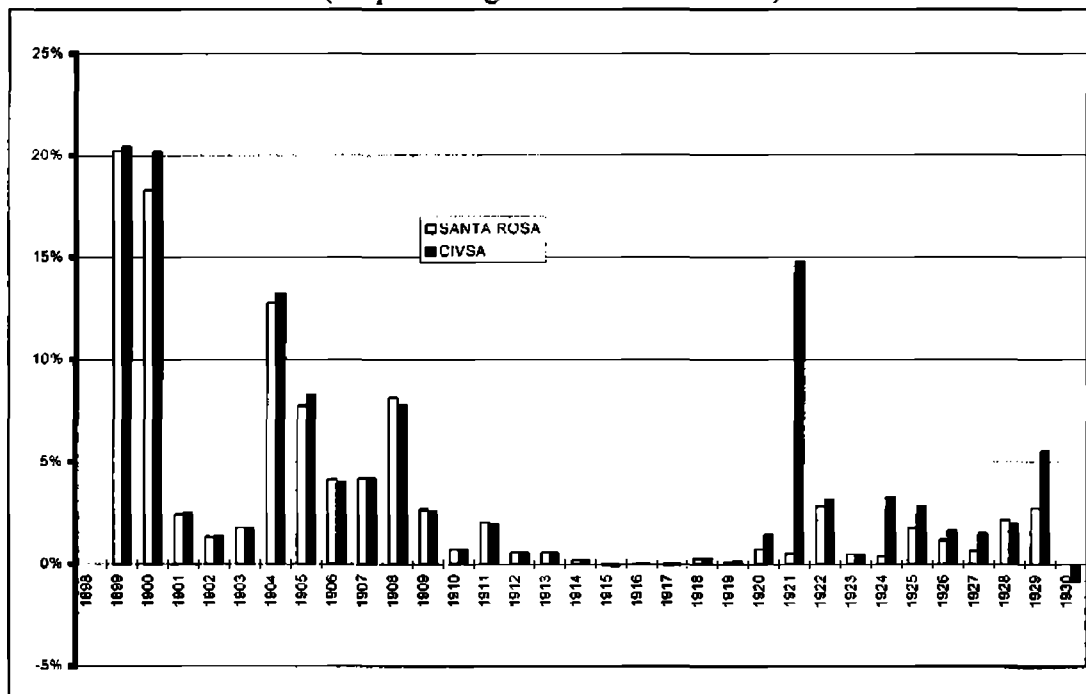
<sup>39</sup> Once the eight hours shift was established punctuality became very important for the company, since it considered that the shift should be of eight "effective" hours. Thus the gates were

Yet, this was not all that was required to keep the industry's health and international competitiveness at the levels it had during the Porfiriato (that was not great), let alone to improve them. As Adam Przeworski explains: "No one drew the blueprint and yet the [capitalist] system is designed in such a way that if profits are not sufficient, then eventually either wages must fall, or employment, or both.(...)Decisions by capitalists to save and choose techniques of production constitute the parameters which constrain the possibility of improvement of material conditions of anyone."<sup>40</sup>

New technology adopted by the textile industry worldwide was not introduced in Mexican mills. One of the most notable improvements in textile production was the introduction of automatic looms. A weaver who could attend at the most four of the older type of looms, could attend from twenty to forty automatic looms.<sup>41</sup> Another innovation that could increase weavers productivity was the introduction of double-length looms.

**Figure 9.** Investments in Real State, Machinery and Equipment at CIVSA.

(As percentage of total fixed assets)



Source: CIVSA and Santa Rosa General Balances 1900-1929.

closed strictly on time. On June 12, 1917, for example, Río Blanco left out between 60 and 70 workers who had come late. At first, this factory policy aroused complaints, but then it seems workers became used to it. CIDOSA, Correspondence, Río Blanco office to Governor at Córdoba, June 13, 1917.

<sup>40</sup> Adam Przeworski, "Capitalism and Social Democracy":165

<sup>41</sup> México, Secretaría de la Economía Nacional [Juan Chávez Orozco], "Monografía Económico-Industrial de la Fabricación de Hilados y Tejidos de Algodón": 66

The wage schedule that came out of the Convention of Workers and Industrialists of 1925-1927 fixed the maximum number of machines workers should attend and established specific wages per piece produced. Under these conditions industrialists had no incentive to introduce better machinery because it would not enable them to reduce labor costs, as the wages per piece and the workers per machine had to remain invariable.<sup>42</sup>

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<sup>42</sup> *Ibid:* 67

**Table 4. Spinners' Productivity 1900-1930**

	Spinners (Warp No. 29)			Spinners (Weft No. 30)			Spindles per worker
	Real wage per kilo	Kilos per worker (weekly)	Kilos per worker (hourly)	Real wage per kilo	Kilos per worker (weekly)	Kilos per worker (hourly)	
1900	\$0.03	244.2	20.4	\$0.04	277.2	23.1	
1901	\$0.03	220.9	18.4	\$0.04	222.0	18.5	
1902	\$0.03	241.0	20.1	\$0.04	262.0	21.8	
1903	\$0.03	234.3	19.5	\$0.03	232.0	19.3	
1904	\$0.03	181.5	15.1	\$0.03	238.8	19.9	
1905	\$0.03	256.3	21.4	\$0.03	239.7	20.0	
1906	\$0.01	231.8	19.3	\$0.04	221.0	18.4	
1907	\$0.04	225.3	18.8	\$0.04	227.9	19.0	
1908	\$0.04	213.4	17.8	\$0.03	231.3	19.3	
1909	\$0.03	229.4	19.1	\$0.03	225.1	18.8	
1910	\$0.03	281.9	24.6	\$0.03	201.8	17.6	289.1
1911	\$0.03	232.3	21.1	\$0.03	219.4	19.9	346.4
1912	\$0.03	253.8	23.2	\$0.03	211.1	20.5	220.6
1913	\$0.03	254.1	25.4	\$0.03	205.3	20.5	217.1
1914	\$0.02	208.1	20.8	\$0.02	218.3	21.8	251.5
1915	\$0.01	190.7	20.1	\$0.01	214.8	22.7	228.6
1916	\$0.02	183.0	20.3	\$0.03	211.6	23.5	376.7
1917	\$0.04	176.3	20.8	\$0.04	212.5	25.1	338.3
1918	\$0.03	178.5	22.3	\$0.03	215.2	26.9	365.7
1919	\$0.03	160.3	20.0	\$0.03	216.9	27.1	359.2
1920	\$0.03	176.5	22.1	\$0.03	236.3	29.5	298.5
1921	\$0.04	190.3	23.8	\$0.04	206.3	25.8	365.7
1922	\$0.04	198.0	24.8	\$0.04	205.0	25.6	338.3
1923	\$0.04	204.9	25.6	\$0.05	210.1	26.3	322.2
1924	\$0.04	185.1	23.1	\$0.04	204.5	25.6	319.6
1925	\$0.04	208.2	26.0	\$0.04	220.4	27.6	294.1
1926	\$0.04	242.6	30.3	\$0.04	224.9	28.1	300.7
1927	\$0.05	219.9	27.5	\$0.05	257.8	32.2	285.9
1928	\$0.05	224.7	28.1	\$0.05	268.8	33.6	335.5
1929	\$0.05	268.2	33.5	\$0.05	260.6	32.6	309.9
1900-1910	\$0.03	232.7	19.5	\$0.03	234.4	19.6	289.1
1910-1920	\$0.03	201.3	21.6	\$0.03	216.2	23.8	300.3
1920-1929	\$0.04	215.8	27.0	\$0.04	228.7	28.6	319.1

Source: A sample was taken from CV, Payrolls, June and November 1900-1930. Number of spindles taken from the "Manifestaciones para el Timbre", CV, Correspondence, 1910-1930.

The decisions to establish fixed wage schedules per piece and limits to machines per worker, were not taken out of ignorance. In 1926 the Saco-Lowell Shops, afraid that the agreements of the Convention would affect the demand of their machinery in Mexico, sent a letter to the presidency of the Convention, explaining how detrimental the new regulations were to the adoption of new technology. The letter described the advantages of automatic looms as well as that of machinery specifically designed for the processing of scrap cotton. It

explained why these innovations would not be adopted with the new wage schedule and regulations proposed by the Convention.<sup>43</sup>

However the majority of votes in the Convention were in favor of the rigid wage schedule, in terms of technology, it ended establishing. Workers saw in modern machines a threat to employment, industrialists a threat to the survival of their decrepit mills, and government the threat of social discontent. It was easier to raise tariffs and let the industry survive as it was. It is possible that the over representation of smaller and also more old-fashion mills in the Convention further contributed to this result.<sup>44</sup>

CIVSA documents evidence the effects of the Convention regulations on the company's investment decisions. In 1927 double-length looms were installed in Santa Rosa.<sup>45</sup> However, a year later CIVSA's board of directors decided to remove the new looms given that wages demanded by the Santa Rosa's union for those who ran them made production too costly, as this type of looms had not been considered in the Convention. CIVSA's management decided to install these looms at El León, where they thought they would face less labor resistance.<sup>46</sup> In April 1928 CIVSA's directors decided to purchase machinery to process artificial silk (*artisela*).<sup>47</sup> By August of the following year, they had not been able to run the new machinery for a similar reason.<sup>48</sup>

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<sup>43</sup> Saco Lowell Shops to Presidencia de la Convención, August 7, 1926, AGN, DT, 979/3.

<sup>44</sup> According to the Convention's rules every mill had a vote regardless of its size. This gave a majority vote to smaller, usually more outdated, mills. México, [Moisés T. de la Peña], *op.cit.*: 48

<sup>45</sup> CV, AC, July 12, 1927.

<sup>46</sup> CV, AC, August 28, 1928 and September 4, 1928.

<sup>47</sup> CV, AC, April 24, 1928.

<sup>48</sup> CV, AC, August 29, 1929.

**Table 5. Weavers' Productivity 1900-1930**

	Meters per worker (weekly)	Meters per worker (hourly)	Meters per loom	Looms per worker	Real wage per meter	Real wage per week	Meters per loom per hour
1900	533.3	44.4	231.9	2.30	\$0.01	\$4.48	3.09
1901	676.8	56.4	294.3	2.30	\$0.01	\$5.56	3.34
1902	683.4	56.9	298.4	2.29	\$0.01	\$5.37	4.40
1903	540.5	45.0	229.0	2.36	\$0.01	\$4.19	3.22
1904	527.4	44.0	211.0	2.50	\$0.01	\$4.19	3.70
1905	723.1	60.3	292.7	2.47	\$0.01	\$5.58	3.28
1906	623.4	52.0	238.9	2.61	\$0.01	\$5.51	2.74
1907	663.9	55.3	257.3	2.58	\$0.01	\$6.10	3.51
1908	634.5	52.9	275.9	2.30	\$0.01	\$6.57	3.85
1909	712.6	59.4	300.7	2.37	\$0.01	\$6.73	3.93
1910	561.5	48.9	257.6	2.18	\$0.01	\$5.00	4.41
1911	418.4	38.0	181.1	2.31	\$0.01	\$3.84	3.82
1912	694.3	66.3	276.6	2.51	\$0.01	\$7.04	5.01
1913	615.6	58.8	218.3	2.82	\$0.01	\$6.81	4.30
1914	774.6	73.9	289.0	2.68	\$0.01	\$6.00	5.03
1915	598.2	63.1	229.2	2.61	\$0.004	\$2.29	4.43
1916	703.2	74.2	236.0	2.98	\$0.01	\$5.36	4.85
1917	572.9	67.6	220.3	2.60	\$0.01	\$7.57	4.33
1918	542.3	64.0	203.9	2.66	\$0.01	\$6.34	4.58
1919	421.8	49.8	160.4	2.63	\$0.01	\$4.89	4.18
1920	535.1	63.2	209.0	2.56	\$0.01	\$5.85	4.74
1921	627.7	74.1	266.0	2.36	\$0.01	\$7.52	4.84
1922	558.3	65.9	229.8	2.43	\$0.02	\$8.98	4.25
1923	548.2	64.7	227.5	2.41	\$0.02	\$9.90	3.69
1924	542.6	64.1	220.6	2.46	\$0.01	\$8.13	5.04
1925	592.7	70.0	248.0	2.39	\$0.01	\$8.11	4.96
1926	628.5	74.2	265.2	2.37	\$0.01	\$8.07	5.18
1927	572.0	67.5	239.3	2.39	\$0.02	\$9.98	4.86
1928	631.0	74.5	251.4	2.51	\$0.02	\$11.30	4.52
1929	617.2	72.9	250.9	2.46	\$0.02	\$10.91	4.74
1900-1910	625.5	52.3	262.5	2.39	\$0.01	\$5.39	3.59
1911-1920	587.6	61.9	222.4	2.64	\$0.01	\$5.60	4.53
1921-1929	590.9	69.8	244.3	2.42	\$0.02	\$9.21	4.68

Source: Meters per loom and wage per meter was obtained from a sample of 30 weavers from CV, Payrolls, June and November 1900-1930 and looms per workers were taken from CV, Payrolls week 6, 1900-1930.

In May 1929, CIVSA's main engineer presented a cost-benefit analysis, explaining the convenience of installing new high speed warping machines, which would generate substantial savings. CIVSA's board of directors decided to postpone their purchase until they were able to get "a fair" wage rate for warping with these new machines. Together with CIDOSA, the other important

textile company in Orizaba, they started negotiations with the Ministry of Industry on this matter, but at least until the end of 1930 they were fruitless.<sup>49</sup>

Although the effects of rigid regulations on technological innovation must have been worse in those states where the labor movement was stronger, contemporary studies on the textile industry tell they prevailed over the whole country.<sup>50</sup> Aggregate data for Mexico's textile industry evidences few investment.<sup>51</sup> Although some new factories were built in the twenties, most of them were small establishments devoted to the production of smallwares (*bonetería*) mainly on artificial silk. This is why while the number of factories increased by 22% from 1921 to 1930, the number of active spindles and looms only increased by 9% and 8% respectively (see Table 7). Machinery per worker (measured in loom equivalents) that increased during the last decade of the Porfiriato by 18%, increased by a slower rate of 5% during the twenties. During the Revolution loom equivalents per worker grew when measured by a per shift basis because of the reduction in the length of the workday.

Labor productivity increased between 1926 and 1930, not only when measured by loom equivalents per shift but also when measured in sales and production per worker. This was the result of (1) the implementation of the Convention's wages per piece that increased labor intensity and (2) the reduction of employment and of hours worked per mill as a consequence of the depression. "This increase was by no means a result of an improvement in machinery in the mills."<sup>52</sup>

The agreements of the Convention may be understandable under the circumstances of world wide depression. But the precepts adopted there were ratified over and over. As late as 1943 a memorandum of the Ministry of Labor to the President of Mexico explained that the adoption of "Toyada" automatic looms in Japan had generated misery to Japanese textile workers. Furthermore, if some mills adopted the new technology others would go bankrupt and this would generate unemployment. It said that England had taken wise measures to protect its industry both from the adoption of automatic looms and from

<sup>49</sup> CV, AC, May 14, 1929.

<sup>50</sup> México, [Juan Chávez Orozco], *op.cit.*: 67, and México, Secretaría de la Economía Nacional [Moisés T. de la Peña], *op.cit.*: 187-191.

<sup>51</sup> National data on the cotton textile industry was obtained from the following sources: For 1900-1911: México, SHCP, *Boletín de Estadística Fiscal*, several issues, México, *Mexican Year Book 1908*. For 1912: AGN, DT 5/4/4 "Manifestaciones presentadas por los fabricantes de hilados y tejidos de algodón durante enero a junio de 1912". For 1913: AGN, DT, 31/2/4, "Estadística semestral de las fcas. de hilados y tejidos de algodón de la República Mexicana correspondiente al semestre de 1913". For 1914-1920: Stephen Haber, *Industry and Underdevelopment*: 124 and Moisés T. de la Peña, *op.cit.*: 1934: 14 and 126. For 1921-24: México, Poder Ejecutivo Federal, Departamento de Estadística Nacional, *Aspectos Económicos de un Quinquenio: 1921-1925*: 8-29, *Boletín de Estadística*, January 1924: 52-55, *Estadística Nacional*, September 30, 1925:5-17 For 1925-1930: México, SHCP, Departamento de Impuestos Especiales, Sección de Hilados y Tejidos, "Estadísticas del Ramo de Hilados y Tejidos de Algodón y de Lana", typewritten reports.

<sup>52</sup> México [Juan Chávez Orozco], *op.cit.*: 63.



Japanese competition. It concluded that Mexican workers should not be sacrificed, by the adoption of new technology, in order to gain competition in world markets<sup>53</sup>

**Table 6. The Mexican Textile Industry 1900-1930**

	Active Mills	Spindles	Looms	Workers	Cotton <sup>a)</sup> Cons.	Sales <sup>a)</sup> (nominal)	Sales <sup>a)</sup> (real)	Loom Eq. per Worker	Loom Eq. per Shift	Cotton per Worker	Sales per Worker
1900	134	557,391	17,202	26,764	28,990	\$35,459	\$35,459	0.87	0.87	1,083	\$1,325
1901	133	602,223	18,885	27,863	30,262	\$33,877	\$35,553	0.92	0.92	1,094	\$1,265
1902	124	575,304	17,974	25,316	27,628	\$28,780	\$27,939	0.98	0.96	1,091	\$1,104
1903	115	630,201	20,124	26,249	27,512	\$36,907	\$31,339	1.03	1.03	1,048	\$1,194
1904	119	632,018	20,326	27,033	28,841	\$42,511	\$34,646	1.01	1.01	1,067	\$1,282
1905	127	666,659	21,932	29,483	31,230	\$51,214	\$46,097	0.99	0.99	1,059	\$1,564
1906	130	683,739	22,776	31,673	35,826	\$51,171	\$44,894	0.96	0.96	1,131	\$1,417
1907	129	693,842	23,507	33,132	36,654	\$51,686	\$41,326	0.94	0.94	1,106	\$1,247
1908	132	732,876	24,997	35,816	36,040	\$54,934	\$45,303	0.92	0.92	1,006	\$1,265
1909	129	726,278	25,327	32,229	35,435	\$43,370	\$36,656	1.03	1.03	1,099	\$1,137
1910	123	702,874	25,017	31,963	34,736	\$50,651	\$39,119	1.02	1.02	1,087	\$1,224
1911	119	725,297	24,436	32,147	34,568	\$51,348	\$39,286	1.01	1.01	1,075	\$1,222
1912	127	762,149	26,801	32,128	32,366	\$52,847	\$38,804	1.10	1.31	1,007	\$1,208
1913	118	752,804	26,791	32,641	32,821			1.07	1.29	1,006	
1914	90										
1915	84										
1916	93										
1917	92	573,072	20,489	22,187		\$64,130	\$29,974	1.21	1.81		\$1,351
1918*	104	689,173	25,017	27,880		\$48,567	\$19,574	1.18	1.77		\$707
1919	110	749,237	27,020	33,185		\$69,778	\$25,169	1.06	1.59		\$758
1920*	120	753,837	27,301	37,936	31,694	\$120,492	\$36,890	0.94	1.41	835	\$972
1921*	121	770,945	28,409	38,227	35,924	\$93,942	\$28,329	0.97	1.45	940	\$741
1922	119	803,230	29,521	39,677	34,854	\$85,023	\$26,216	0.97	1.45	873	\$661
1923	110	802,363	29,668	39,629	32,344	\$97,490	\$35,882	0.97	1.46	816	\$905
1924	116	812,165	29,888	37,732	30,517	\$96,435	\$35,496	1.03	1.54	809	\$941
1925	130	831,524	30,800	43,199	40,997	\$108,396	\$38,621	0.92	1.39	949	\$894
1926	138	842,793	31,296	44,250	41,523	\$95,438	\$34,782	0.92	1.38	938	\$786
1927	144	826,702	30,614	41,226	39,356	\$91,069	\$34,920	0.96	1.44	955	\$847
1928	132	823,862		38,889	37,031	\$96,293	\$37,818			952	\$972
1929	144	831,486	30,090	38,804	39,437	\$97,162	\$38,283	1.01	1.52	1,016	\$986
1930	148	842,265	30,625	39,424	40,582	\$91,145	\$38,857	1.01	1.52	1,029	\$988
1900-1910	-8%	26%	45%	19%	20%	43%	10%	18%	18%	1,079	\$1,277
1911-1920	1%	4%	12%	18%	-8%	135%	-6%	-7%	40%	981	\$1,036
1921-1930	22%	9%	8%	3%	13%	-3%	37%	5%	5%	928	\$872

Sources: See footnote No. 51.

Notes: Loom equivalents have been calculated following Gregory Clark, "Why Isn't the Whole World Developed: 19-49. The length of the workday was considered of 12 twelve hours from 1900 to 1911, of 10 hours from 1912 to 1916, of 9 hours in 1917 and of 8 hours from 1917 to 1930. This is not accurate given that workday regulations were not strictly followed in all mills.

The result was that the textile industry became every day more outdated. In 1957, 34.4% of the spindles and 33% of the looms operating in that year had been built before 1910. This situation was worse in those states, such as

<sup>53</sup> México, Secretaría del Trabajo [Miguel A. Quintana], "Los Problemas de la Industria Textil del Algodón": 13-17.

Veracruz, where labor regulations were more strictly implemented because of their stronger labor movements. In this state 67% of the spindles and 73% of the looms working in 1957 had been manufactured before 1910.<sup>54</sup> In the long run workers were victims of their own success.<sup>55</sup>

### **Conclusions.**

This article shows that institutional changes on capital-labor relations that took place between 1906 and 1930 did have an important economic impact in the Mexican Textile Industry. By organizing in unions millhands were able to claim a greater share of the surplus they worked to produce.

Part of the battle, particularly between 1908 and 1920, was fought against inflation. In this period unions' struggle succeeded in gaining back, over and over, the purchasing they lost as a consequence of increasing prices. Additionally, unions achieved a substantial reduction in the working shift, that went from twelve hours in 1907 to eight hours in mid 1917.

While until 1907 there was relative real wages stability, from 1907 to 1911 they fell by almost 15%. Through the surge of the labor movement and the support the new government provided through the Department of Labor, workers were able to fight back inflation during the first years of the Revolution. The minimum wage for the textile industry negotiated at the Convention of Industrialists of July 1912 was the most significant result of this process. From 1911 to 1913 real wages per shift grew by 20% and hourly wages increased by 32%.

However these gains proved to be short lived. After Huerta seized power, and the war took on greater proportions, political chaos gave way to monetary anarchy, and inflation struck back with even greater intensity. From 1914 to 1916, hyperinflation caused an impressive decline in workers' purchasing power, which fell in its worst point in May 1916, to a seventh of what it had been in 1912 in terms of gold pesos. Evidence shows that companies were pricing their merchandise in gold as early as December 1915 which would imply a transfer of income from workers to company owners. In December 1916 after several strikes workers finally won the battle for payment of wages in gold pesos.

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<sup>54</sup> Javier Barajas Manzano, *Aspectos de la Industria Textil del Algodón en México*: 67-74, 97-99.

<sup>55</sup> This result is similar to that which comes from Adam Przeworski's model of accumulation and legitimation, when the economic militancy of organized wage-earners ( $r$  in the model) is high. Yet, the situation that the Mexican textile industry faced in the twenties is more complex than this model. Given that  $r$  is different in different regions, this lowers the level of  $r$  that in the long run reduces wages in a region with a relative higher  $r$ , also shortening the span of time at which wages will decrease. An increase in tariffs does the opposite, allowing for a greater increase in  $r$  without lowering wages, and extending the time before this takes place. I am currently working in expanding Przeworski's model in this direction. See Adam Przeworski, *ibid*: 148-159, 179-196.

In 1917 workers were able to regain the real wages they earned in 1913, which had been lost during the inflationary period from 1914 to 1916. The purchasing power achieved from 1917 to 1920 was an improvement over the final years of the Porfiriato. Yet, it was not very different from the real wage earned in 1907. However, in terms of wages per hour, real wages increased in this period relative to those of 1913, since the shift was reduced from ten to eight hours. Furthermore the labor laws of Veracruz of 1914 and 1915 and the Constitution of 1917 brought about other non-wage benefits to workers, such as sickness and accident compensation and retirement pensions, which CIVSA directors valued as an additional 15% increase in wages.

It was very difficult for workers to maintain the purchasing power just recovered. From 1917 to 1920 the effects of World War I on the Mexican economy and the destruction of economic institutions and infrastructure caused by the Revolution made the return to price stability a difficult task. In 1917 an important inflationary process took place despite the enormous monetary contraction generated by the collapse of the "infalsificables". Despite of great nominal wage increases, real weekly wages diminished. A loss that was almost recovered during the following year because of the price deflation. Yet, by 1920 workers weekly real wages were almost 10% below those of 1913.

Real wages increased from 1920 to 1929 by an impressive 131%. National real wages in the textile industry also increased, but not as much. The wage gap between regions opened during the twenties as a result of the different regional strength of the labor movement and thus the degree by which new labor regulations were implemented. Between 1925 and 1927 a Convention of workers and industrialists was held in order to establish a general wage schedule for the industry. However it did not fulfill its objective and wages became more heterogeneous across regions after the Convention ended. Its agreements established rigid regulations on machines per worker and wages per piece that were detrimental for technological progress in the industry. Although profit rates recovered in Santa Rosa after the Revolution, stock prices and investment levels did not.

Labor productivity levels did not fall as a consequence of the Revolution, in spite of union control in the shop-floor. However they did not rise in the twenties, as a consequence of the lack of investment in new machinery. Given the important technological progress that took place in textile machinery world-wide, Santa Rosa's international competitiveness fell behind its not very high Porfirian competitive levels. This pattern seems to have prevailed in the Mexican textile industry in general, although was worse in those regions with stronger labor movements.

The three major actors in the political economy of the textile industry: businessmen, labor and the government, chose in the late twenties an institutional arrangement that gave no incentives for technological transformation and required high tariffs. This enabled most mills to survive,

jobs to subsist and no social unrest to arouse. However it condemned textile industry to become every day more updated and unable to compete in world markets. For reasons beyond the scope of this paper, this institutional arrangement prevailed in Mexico for more than fifty years, with terrible consequences for the development of the industry and the well being of its workers.

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