

Gender, Cigar and Cigarettes.  
Technological Change and National Patterns  
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This paper assumes that the employer's choice of a particular organisation of production and, as a matter of fact, of a particular technology were not indifferent to gender. Labour markets were sexually differentiated, since women and men were considered to be distinct labour forces, separated by virtue of the differing roles they were supposed to play in the family economy – the breadwinner and the housewife – and of the characteristics associated to each of them as labourers<sup>2</sup>. Technological decisions were not independent of the gender division of labour. The introduction of a new technology could imply the arrival of a male profession as in railways, or the substitution of male by female workers in labour intensive industries such as tobacco manufacturing. Technology and occupational segregation according to gender are highly correlated. However, these patterns are not universal. When the cigarette-making Bonsack machine was first introduced in the market in the 1880s a strict gender division of labour operated in all countries, but women and men tasks diverged enormously. Tobacco was manufactured mainly by men in countries like the US or Cuba and mainly by women in other countries, such as France or Spain. These differences were related to the labour market structure, to consumption patterns and to the organisation of the sector regarding taxation in each country; thus we find cases of monopoly-run and of non-monopolistic tobacco industries. Despite some exceptions, in general terms, during the 19<sup>th</sup> Century and before the mechanisation process started, female cigar and cigarette makers worked in countries where a fiscal tobacco monopoly existed, while men were in charge of the work –mainly cigars- in countries with a non-monopolistic industry, only in countries where the share of cigarettes was important in the overall consumption firms also hired women for manufacturing them.

This paper is divided in two sections corresponding with the two periods in which technological change and changes in the production process caused alterations in the gender division of labour. In fact, the feminisation of the tobacco labour force happened in two phases, and the process implied important national differences. Monopolistic countries shift in a first phase and non-monopolistic countries in a second one.

The first one happened before the mechanisation process and it is coincident with most of the 19<sup>th</sup> Century, when the consumption of smoking tobacco was spreading through Europe but it was still not important in countries like the US, where only cigars had a market and accounted for a small proportion of total consumption. In some European countries such as France, Italy or Spain, snuff tobacco was substituted at the end of 18<sup>th</sup> century and early 19<sup>th</sup> century by smoking tobacco. Nevertheless patterns of

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<sup>2</sup> Female were considered more flexible, cheaper and less unionised. Some authors show how employers used different methods depending on the gender of the workers they could hire. Jordan's study (1989) on the exclusion of women from the industry in 19<sup>th</sup> Century Britain is very revealing. For different cases on a firm-level see Sarasúa and Gálvez (2003).

consumption remained national with the US preferring chewing tobacco, pipe smoking as the main choice in Northern Europe and cut tobacco consumed in France, where smokers used to roll their own cigarettes. In those countries where the industry was organised in a fiscal monopoly, the French model -centralised production and female labour-, was adopted. In those cases it becomes evident that production was centralised for fiscal reasons as no technological change justified the centralisation of production in big factories (Gálvez, 2000: 66-80). Tobacco consumption increased together with income and urbanisation. Since the tobacco industry was labour intensive and the monopoly demanded centralisation in order to avoid fraud, female workforce was preferred. In countries where the tax system did not impose a monopoly, production mainly came from workshops or small and medium factories. Despite some exceptions as female immigrant Bohemian cigar makers in late 19<sup>th</sup> century New York, skilled cigar makers were men who normally were unionised and belonged to the labour aristocracy.<sup>3</sup> Cigarette manufacturing was normally made by women but it accounted for an insignificant proportion of total tobacco production. In those countries, women were located in the industry in less valued positions in charge of low-skilled tasks such as stripping tobacco leaves.

The second section in this article deals with the introduction of the Bonsack machine in 1881, the cigar making machines in the 1920s, and the gradual standardisation of consumption, with the triumph of cigarettes over other tobacco products after the First World War. The mechanisation of production brought along an important change in the division of labour inside the tobacco industry. In those countries where tobacco was manufactured mainly by men, an important substitution of male labour force for female workers occurred, except in the production of hand-made high quality cigars, which continued to be manufactured by men. The substitution has to be explained on the one hand by the triumph of the cigarette, considered a typically female task, which increased the demand of female workers. While other products traditionally manufactured by men were in decline with the subsequent unemployment. On the other hand, in the first decades of the 20<sup>th</sup> century, cigars started to be produced first semi-mechanically, and second mechanically. The cigar making machines were occupied by women. In addition, the competition made by mechanically made cigar factories to smaller hand made cigar factories implied a wages cut. Lower wages converted hand made cigar factories also a female job. Only high quality workshop kept male cigar makers. In monopoly countries, female cigar and cigarette makers continued to be employed in mechanical workshops but their number and strength reduced. The percentage of women reduced since they entered more men than formerly were needed as machine fixers, foremen, and mechanics. In all countries, a new male elite appeared: the mechanic, who was always a man.

This paper aims at identifying which variables explain national patterns in the interaction between technological change and gender division of labour and occupational segregation. For that purpose the Spanish case will be analysed in an international comparative perspective in the first phase, and the US one in the second phase. One representing a monopolistic country and the second one, a non-monopolistic one.

## 1.- Europe starts smoking

Tobacco consumption appeared in Western civilisation at the time of the colonisation of America, but was already strongly present in the Amerindian cultures. The

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<sup>3</sup> On labour aristocracy and the social construction of skill in tobacco manufacture Gálvez (2000). A criticism of the myth of the Cuban cigar makers labour aristocracy in Stubs (1989), and for the North-American case, Cooper (1987).

very first evidence of tobacco consumption appeared in Columbus first trip diary where he wrote that the streets were full of people carrying a half-burnt stick aromatic with some leaves which serves as nurturing for them. Three main forms of tobacco consumption passed to Europe: chewing, smoking and snuffing, and from Europe they were passed everywhere through colonial expansion (Goodman, 1993). The penetration in Europe followed national patterns which remained strong until the 20<sup>th</sup> century. Table 1 shows national preferences in tobacco consumption at the end of the 19<sup>th</sup> century in some European monopolies.

Table. 1 Percentage in Kilograms of each type of tobacco product over the total produced in the different European monopolies in 1894-5.

Monopolies	Rapé	Rolls	Chewing	Cut	Cigars	Cigarettes	Total
Spain	-	-	-	47,51	21,16	31,33	100
Hungary	0,25	-	-	82,42	12,00	5,33	100
Austria	5,14	-	4,00	68,20	17,23	5,43	100
Italy	16,28	-	-	38,46	34,33	10,93	100
France*	14,69	2,03	1,42	69,98	8,50	2,93	100
Portugal**	13,47	24,80	-	16,00	39,76	6,06	100

Source: E. Delgado, *La Compañía Arrendataria de Tabacos*, Madrid, 1900.\*1892, \*\* 1892-3

From an early stage governments realised the possibilities of such a product and started to tax it or to control its trade, production and consumption either under a monopolistic regime or through taxes. The first tobacco monopoly was established in Mantua in 1634 and the first big European nation to found it was Spain in 1637. Other European countries established as well tobacco fiscal monopolies. In France it was established by Colbert in 1674 to increase French fiscal revenues and Austria created a tobacco fiscal monopoly in 1670. Although the figure of a fiscal monopoly could be considered typical of the Ancient Regime, there were countries such as England or Holland that never established fiscal monopolies and other countries such as Japan or Sweden, which did it in the 20<sup>th</sup> century.<sup>4</sup> The Spanish monopoly was initially run by individual entrepreneurs, but in the 18<sup>th</sup> century, following the French influence, the Treasury took direct control over the monopoly's management and retained it until 1887, when the state decided to lease the management of the tobacco monopoly to a private company, *Compañía Arrendataria de Tabacos* (or CAT) which accomplished the mechanisation process. The direct control of the state during the eighteenth century and most part of the 19<sup>th</sup> is important to explain the substitution of male by female cigar and cigarette makers in the Spanish case.

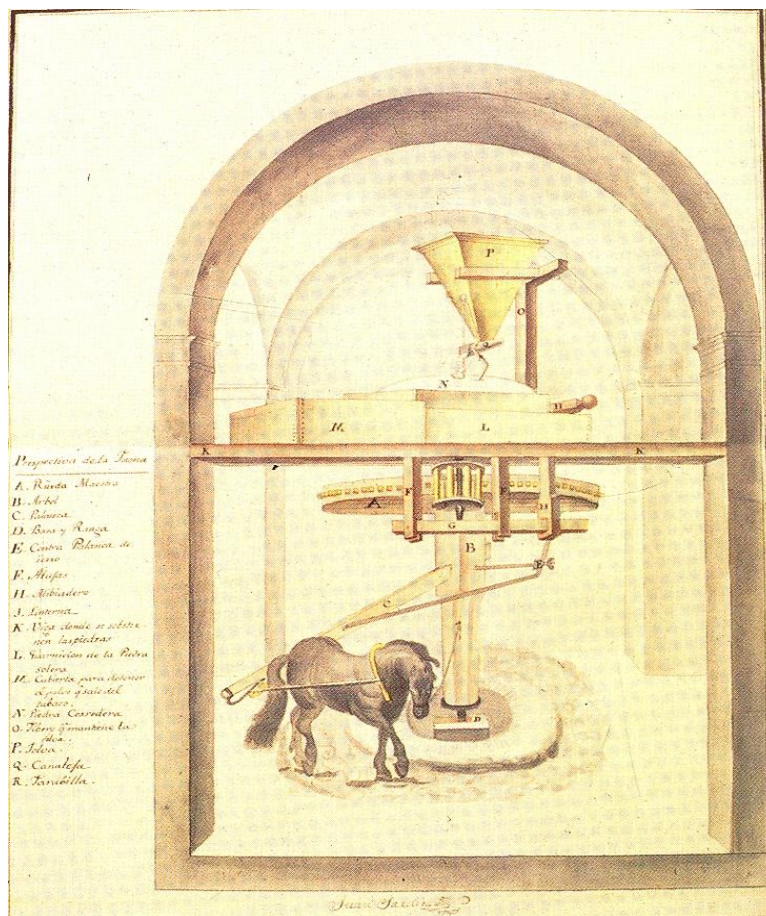
Both, fiscal organisation and national tobacco consumption patterns determined the organisation of production. On the one hand, a fiscal monopoly means that the State exploits an economic activity under a monopolistic regime, installing a collect procedure and a system to fight against smuggling.<sup>5</sup> So, the concentration of the production process is

<sup>4</sup> Individually, the introduction of a fiscal monopoly has always been a measure to guarantee the collection of money in a short period of time as it was the case in Japan, where a monopoly was established in 1904, as a consequence of the wars Japan was involved in in the previous years (Madsen, 1916).

<sup>5</sup> Both offer a fruitful source of public revenues and provide goods and services, and usually are established in countries with non-progressive fiscal systems. Fiscal monopolies are normally imposed on products of 'universal' consumption such as salt, tobacco or petrol, having a rather inelastic demand facing price variations, and being more dependent on rent than on price variations. A tobacco monopoly could be maintained because there is no easy substitute for tobacco, and not all state and treasuries had the same control over the process of collecting revenues (Gálvez, 2005).

more convenient in order to avoid fraud. On the other hand, not all kinds of manufactured tobacco required the same organisation of production and the same degree of integration. Snuff tobacco production benefited more from integration than cigars or cigarettes. From the beginning of the 17th century all Spanish tobacco production was concentrated in Seville under a centralised manufacturing system.<sup>6</sup> Concentration of production increased with the building of a new factory, opened in 1758 and especially designed for the production of snuff tobacco. This factory represented the largest civil building in Spain and possibly the largest tobacco factory in the world.<sup>7</sup> It brought together onto a single site machine warehouses, stables, production and repair workshop, storerooms and rooms for auxiliary activity.

Fig. 1. Fabrication of cut tobacco at Royal Tobacco Factory of Seville, 1769



Source: Library of the Spanish Royal Palace

During the 17th and the first half of the 18th centuries Spaniards consumed tobacco predominantly as snuff, made in its various forms in the Seville factory (*exquisito, fino, palillos, grosso, negro, cucarachero*); it was also imported from Cuba, in which case it was known as *Polvomonte* of the Indies. The number of workers at the Seville factory increased from around 50 in 1647 to some 1,200 a century later. In this period, all the factory workers were men, a “requirement” for snuff production since physical strength was essential for moving the millstones and the tobacco bundles. Although representing a small

<sup>6</sup> However, authors such as Valdaliso and López (2000: 87-90) have difficulties in considering the Royal manufacturers as factories since they were not profit centres. Nevertheless, the fiscal character of tobacco manufacturing obliges to consider this manufacturer in a different way.

<sup>7</sup> From an industrial architecture point of view, the modular plan of the factory anticipated 19th century factories in almost a century (Bonet Correa, 1984:49-50).

proportion of production, cigars were produced in the factory from the 17th century on, though mainly in Cádiz, where a subsidiary of the Seville factory was established. While in Seville cigars were made by men in order to avoid mixing both sexes in the same building, in Cádiz the work was done by women. In both places, the cigar-makers were remunerated under a piecework system that contrasted with the fixed daily wages paid to snuff tobacco workers. While cigar production was entirely manual, snuff tobacco production was undergoing continuous technical improvement. Apart from an increase in the number of workers, the equipment pools also grew in the period 1647 to 1750: the figure of three mills in the former year rose to one hundred in the latter, and the number of horses rose from 5 to 257. Animal traction mills replaced manual mortars, whose number fell from 26 to 10 between 1647 and 1700. There was not only an increase in the quantity of production tools; their technical efficiency also increased as a result of the improvement of the mills, which initially had one stone and later two or even more, moved by an animal. The sieving process evolved in a similar fashion, so that towards the end of the period a single operator could move several cases of sieves (Comín and Martín-Aceña (1999: 57).

During the second half of the 18th century tobacco consumption shifted from snuff to smoking. In 1740, snuff constituted 67.4% of the consumption provided by the monopoly, whilst consumption of leaf, cigars and branch represented 32.6%. By 1798, however, these proportions had been reversed, with snuff having fallen to 37.8% whilst leaf, cigar and branch consumption had risen to 62.2% (Comín and Martín-Aceña 1999: 62). The transition had already occurred by 1780, when the consumption of cigars came to exceed that of snuff. The increase in cigar consumption was possible thanks to an increase in production derived from a directive of 1761, which regulated previous advances in production methods and improved administrative mechanisms for ensuring that the ever more numerous workforce carried out its operational duties. But this directive also limited the number of cigar-makers in the factory of Seville to 500. With the increasing consumption of cigars, this number was insufficient. Rodríguez Gordillo (1990) has interpreted this measure as a precaution taken by the Treasury in order to avoid social unrest in the factory. Since national production –and an important part of State revenues – was dependent on that factory and its subsidiary in Cádiz, a high concentration of workers under the same roof was avoided. However, although accepting the avoidance of social unrest as an explanatory variable, this measure has to be included into a more global strategy related to the opening of new factories for smoking tobacco during the subsequent decades and the shift from male to a female workforce.

The explanation of the substitution of male by female cigar-makers is threefold: changes in consumption, the fiscal character of the Spanish tobacco industry, and the promotion of female workforce pursued by the Enlightened reformers at the end of the 18<sup>th</sup> century. Snuff tobacco, the manufacture of which was technologically complex, was increasingly pushed out by a product, the cigar –but soon also the cigarette– that was completely hand-made. While in countries where the market was not organised under a fiscal monopoly regime the production of cigars was carried out in small workshops, in monopoly countries production was centralised. Being a fully manual task the advantages of centralised production were not evident, while the disadvantages in terms of flexibility and production costs were more obvious.

In fact, the Spanish tobacco industry adds complexity to that debate on the origins of the factory system since the main variable in explaining the adoption of the factory

system was neither technological change nor factory discipline.<sup>8</sup> The tobacco fiscal monopoly had a double role: to provide products and to collect taxes. Centralisation of production was the best way to control a tax. It has been argued that the main aim of centralised tobacco production was the control of quality, as was the case with other 18<sup>th</sup> century manufactures dependent upon the Crown. In the case of tobacco the aim was mainly to avoid smuggling. In fact, the only trace of industrial discipline that was maintained in the Spanish tobacco factories was the register. All workers entering and leaving the factories were registered. Apart from that, the work was done in groups and manually, and the workers needed to bring their tools with them. Women could bring their babies to the factories, where they stayed in cradles provided by the management and a flexible use of time – especially entry time - was pursued (Gálvez, 1997). This flexibility needed by those workers will become a key aspect for explaining the smooth mechanisation process pursued in the last years of the 19<sup>th</sup> century and the first decades of the 20<sup>th</sup>.

Since the Treasury needed production to be centralised for fiscal reasons, the production system needed to be as efficient as possible within the bounds set by centralisation. The capital/work ratio which had applied in the case of snuff workshops that were more mechanised thus decreased with the change in consumption in favour of smoking tobacco. Throughout the 17<sup>th</sup> and 18<sup>th</sup> centuries the Seville factory produced snuff, the manufacture of which permitted the use of different types of mills, thereby producing a capital intensive production system. In the 19<sup>th</sup> century, on the other hand, the factories produced cigars and cigarettes, products which, given the prevailing levels of technology, required labour-intensive production methods. These products could not be manufactured mechanically until the 1880s and 1920s because, with the exception of the shredder, suitable machines were not available on the market. Until the end of the 19<sup>th</sup> century, the only technical innovations were the use of the leaf (*capillo*) as an outer layer for cigars, and the mechanisation of shag production. It is in this context that it is necessary to understand the limits in the number of male cigar makers in the factory of Seville laid down by the 1761 directive. A more labour-intensive mode of production would naturally be cheaper with a female labour force. The opening of new factories with female cigar makers and the substitution of male cigar makers by female cigar makers in the Seville factory after the Napoleonic wars are the outcome of that strategy.

In addition, this shift in production was justified by the owner of the monopoly, the Crown, as a strategy to improve the country economic performance. This case fitted perfectly with the labour agenda of the Enlightened reformists: to increase women's labour force participation in order to reduce labour costs and to move male labour to agriculture and other sectors such as public works and the armies (Sarasúa, 2004). This double justification appears clearly in one petition elevated to the Spanish Crown by male cigar makers from the Sevillian factory in 1833. They exposed their opposition to the reduction of male cigar makers and the substitution of male by female workers. They admitted to understand the reason why the substitution came in the first place after the war. In fact, it was only in Seville that the drama of this substitution took place, since Seville was the only factory where men had manufactured cigars during the 18<sup>th</sup> century. Despite the Treasury's preference for female cigarette makers – manifest in the labour force of the new factories - it was difficult to lay off staff in Seville because it was a royal factory dependent upon the Treasury as well as being the largest industrial employer in town. The reorganisation of the Seville factory did not take place until the mass dismissals during the

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<sup>8</sup> See the main pieces on the debate among Landes (1979, 1986) and Marglin (1974).

shut down of the factory because of the Napoleonic Wars in 1808, which affected as many as 700 male cigar makers. The justification of the Crown was that male arms were needed in order to re-establish agriculture production after the war (Gálvez 2000: 72-3). Indeed the reallocation of men in agriculture was explicitly exposed by the Crown.

When the Seville factory reopened in December 1812 the first female workers entered the factory and were taught by women from Cadiz and France. In addition, some male workers were re-employed in order to teach them the trade and to reduce clandestine production. So during almost two decades, a mixed population of cigar makers worked in the tobacco factory of Seville. But when the triumph of smoking tobacco over snuff tobacco had become clear and the new factories in other Spanish cities were fully operational, a large number of men were laid off in 1830, thus provoking a revolt. The Treasury justified the layoff by appealing to the quality of the handmade cigars and cigarettes and arguing that the products made by male workers were of a lower quality than those made by women. The male cigar makers argued that they received worse raw material than the women and that because they had to sustain their families they worked more hastily, the piecework system forcing them to produce a large number of cigarettes in order to generate a daily wage sufficient for this purpose<sup>9</sup>. Men were only re-admitted if they agreed to earn the same piece rates as women, an insult that almost guaranteed to produce a revolt. This shows the second aim of the Crown for hiring female instead of male workers, to keep down labour cost in such a labour-intensive production system. From this period onwards the number of male workers began to fall, since no other *cigarrero* was admitted in any Spanish tobacco factory, whilst the number of female workers continued to increase, reaching a figure in excess of 6,500 in 1887 in the factory of Seville and over 30,000 in the whole country. As it will be analysed in the second part of this paper, the cheaper price of female labour is the core of the shift from male to female labour in tobacco industry worldwide.

When the *cigarreras*, female cigar and cigarette makers, entered into the Spanish tobacco factories in the 19th century, a gender division of labour that implied different types of work and different remuneration systems was established. The gendered division of labour was well defined in the tobacco factories. At the end of the 19th century, male workers were in charge of the supervision of the factory building, the services inside the plant, the maintenance of engines and machinery and the repair and maintenance of the factories themselves. Work in the production workshops was carried out only by women. There were different types of workshops related to the different products, or to the different stages in the production chain, but all were labour intensive tasks. The cigar and cigarette makers all had skills related to specific stages of the manufacturing process. However, the organisation of production was the same in all workshops. All women, except for the ones in charge of the register and the masters of the workshops, worked in groups and by the piece, which gave them a great deal of freedom in their use of time, certainly much more than to male workers, who had individualised jobs and were paid a fixed daily wage (Gálvez, 2003). Between six to ten cigar or cigarette makers worked around a table called *rancho*, directed by one female supervisor, an *ama de rancho* who was charged with the distribution of tobacco, tasks and wages, and the maintenance of order and cleanliness on the *rancho* –see illustrations 2a and 2b. The *ama de rancho* paid each worker, depending on individual output. A number of ranchos made a *taller*, a workshop, directed by the *maestra*, the master who was the major authority in the workshop, having sole responsibility for the supervision of production and discipline within the workshop, on which she had to report to the head of the factory. The

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<sup>9</sup> Gálvez has estimated that in 1924 72% of the female tobacco workers at the Sevillian factory were breadwinners. This calculation cannot be carried out for the 1830s (Galvez, 1997).

oldest *maestras* acted as *porteras*, stationed at the entrance of the workshop to register all comings and goings and to prevent the theft of tobacco by inspecting the workers at the factory gates.

Illustration 2a. Cigar makers, Tobacco Factory of Seville, circa 1900



Source: Archivo Fábrica de Tabacos de Sevilla

Illustration 2b Cigarette makers, Tobacco Factory of Seville, circa 1900



Source: Archivo Fábrica de Tabacos de Sevilla

Differences in consumption patterns and variations in the degree of integration of production explain differences in the gender division of labour in other countries. Other European monopolies such as France or Italy (see illustration 3) showed a pattern similar to the Spanish one. Although, France was the first country to mechanised its production thanks to a very standardised pattern of consumption, scarfelati. Different patterns could be observed in countries in which production was not monopolised by the State. In countries that produced and exported tobacco leaf, like Cuba, women were concentrated in the stripping

of tobacco leaves stages and worked both in farms and plantations and in urban factories.<sup>10</sup> Illustration 4 shows the feminisation of this task in the US. Women were also in charge of the different parts of the packaging process, and in those cases on which cigarettes were hand-made, as in the UK or in a lesser proportion in the US, they were produced by women. In Cuba, where, despite the proliferation of medium and big factories in La Habana and other important cities, a lot of domestic production remained, it is possible that both men and women manufactured cigars in their houses, but never in the factories, where only men manufactured them (Stubbs, 1989). In the US, cigar manufacturing was introduced on a commercial scale around 1800. It was in general a small-scale industry and a typical cigar shop was frequently the establishment of a single owner-worker. There were little change in the industry until after the Civil War.

Illustration 3. Italian cigar makers (circa 1900)



Between 1870 and 1900, the mold, suction plate, and hand-bunching tool were introduced. Before this time no tools had been used save a knife and a bench on which to work. Moreover, the division of labour made possible by these tools gave a group of workers a slight efficiency advantage over a single individual. This period saw the establishment of the factory system in cigar manufacturing in the US. Nevertheless, small-scale manufacture continued to be most characteristics. There were some advantages in large-scale manufacture but these were not such as to disqualify the small shop from successful competition.<sup>11</sup> In the US, in the 19<sup>th</sup> century cigar makers were an elite, a labour aristocracy with local Unions reported as early as 1845 and which used the strike as an industrial weapon very sparingly.<sup>12</sup> These workers were usually skilled, German or Caribbean male immigrants. However a minority of female cigar makers shared the cigar production with male cigar makers. In 1869, thousands of Bohemian women cigar makers arrived to New York as the result of the war of 1866 between Prussia and Austria.<sup>13</sup> Women worked almost exclusively in large workshops or in so-called "Tenement house factories". Tenement wages were about one quarter less than wages paid to regular workers of comparable skill (Schneider, 1985: 329-30). The introduction of women in the craft followed some of the main characteristic of the female labour force: domestic work, lower wages, less skilled derived from the division of labour.

<sup>10</sup> For Cuba see Stubbs (1989).

<sup>11</sup> Evans (1938: 10).

<sup>12</sup> The New York cigarmakers strike of 1877 was one of the most important strikes of the time. See Schneider (1985).

<sup>13</sup> United States Department of Labor (1932: 36).

#### Illustration 4. Tobacco stripping in the US



Tobacco farming in the US. Stripping tobacco [www.chs.org/graphcoll/ images/](http://www.chs.org/graphcoll/images/)

#### 2.- The arrival of machines for cigarette and cigar manufacture

The feminisation of tobacco industry in countries in which female did not occupied male positions in the 18<sup>th</sup> century and early 19<sup>th</sup> century was due to several changes. On the one hand, the triumph of the cigarette, that was a female “job”. It become over the first third of the 20<sup>th</sup> century the most consumed type of tobacco, increasing the demand for female work. In countries with no tradition on cigarette consumption as the US, as cigarette consumption increased, so did female labour passing from 43.000 in 1900 to 98,000 in 1920<sup>14</sup>. On the other hand, it has to be explained by the mechanisation process. First, the mechanisation of the cigarette from the 1880s putting in the market a cheaper, standardised and highly publicised product, which was produced by female machine operators. And second, the mechanisation of part of the cigar manufacturing since the 1920s. As occurred with the cigarette, the mechanisation of cigars demanded female as machine operators. In addition, the decrease in cigar consumption and the mechanisation brought a concentration process and obliged the hand made cigar factories to cut wages, and as a matter of fact, to keep female labour. On the contrary, in European monopolies a reduction of the workforce was accompanied by a decreased in the female share of it. However, gender played an important role on making this industrial crisis a smooth one. Cigar and cigarette making machines were a labour saving technology. In addition, the change to machine equipment needed more men as machine fixers, foremen and technical men. That was also the case in non-monopoly countries. In fact, while the second wave of substitution of male by female workers extended worldwide, a new labour aristocracy appeared with the mechanisation of tobacco production, the mechanic, who was always a man.

The cigarette making Bonsack machine belongs to the Second Industrial Revolution when technological change was accompanied with “horizontal” segregation by gender. Occupational crowding by industry was increasing as well as the differentiation of tasks within the same industry or even the same company. In addition, the model of the male bread-winning family, although neither new nor universal, was probably being used more explicitly to help employers and institutions justify, among other things, the payment of lower wages to woman than to men<sup>15</sup>. It is hard to overestimate the effects of the

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<sup>14</sup> United States Department of Labor (1932: 13).

<sup>15</sup> Janssens (1997), Creighton (1996).

Bonsack Machine in the development of the tobacco industry. Modeling his work on previous machines (none of which had constituted a big improvement over hand-rolled cigarettes), James A. Bonsack of Salem, Virginia, US, patented his cigarette-making machine in 1881. The machine was a major advance over anything available at the time. The first tobacco manufacturer to install the machine for full-scale cigarette production was the Wills company in the UK. Among the various tobacco firms in the US to show an interest in the invention was W. Duke & Sons of Durham, which decided to bring it into full operation in 1885. The new machine produced 200 cigarettes per minute, the joint production of 40 cigarette-makers.<sup>16</sup> Both producers secured preferential rights with the Bonsack Machine Company. They knew very well that cigarettes accounted for a minute fraction of the total tobacco consumption and, although the fashion of cigarette smoking was obviously spreading, none of them believed that cigarettes would ever offer a serious challenge to pipe or cigar smoking.<sup>17</sup>

The cigarette was not a new product, but these mechanically-rolled cigarettes ended up representing such a difference in cost and availability from the old hand-rolled ones that the Bonsack Machine can be seen as a turning point in the history of tobacco production. Both were introduced in Europe by the Spaniards, and it was in Spain, -Table 1-, where at the end of 19<sup>th</sup> century, cigarettes –still hand-made-, constituted the highest proportion of tobacco manufactured.<sup>18</sup> In the US, in 1900 cigarette consumption still represented only 2% of total consumption. Cigarette consumption was indeed marginal, a fact which partly explains the development of an anti-smoking movement against that ‘new product’, which was considered immoral by certain sectors of American society. Moral and health-related arguments against smoking also appropriated Darwinist ideas and the doctrine of the survival of the fittest, as one sees in anti-Spanish propaganda from the period before and during the Spanish-American War. ‘The outcome of the Spanish-American War seemed to offer further proof of the debilitating effects of cigarette smoking’ one newspaper article claimed. In a similar vein, American news services quoted a member of the British Parliament as saying flatly that the Spaniards had lost the war because of its national appetite for cigarettes. In publishing this story, the editor of the Chicago Daily News hastened to add that ‘The argument is, of course, directed against cigarettes, not against smoking generally’. William Randolph Hearst reprinted the British report, along with the Chicago editor’s comments, in an anti-cigarette tract which concluded that ‘Spain might not have reached its present state of deterioration if it had prohibited cigarette manufacturing before it became a national occupation and misfortune’.<sup>19</sup>

Despite this North-American anti-cigarette movement, cigarette production continued in the US mainly by Duke and his company, the American Tobacco Company, which accounted for 90% cigarette production by the turn of the century.<sup>20</sup> In addition to

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<sup>16</sup> Porter (1969: 69).

<sup>17</sup> Alford (1973: 155).

<sup>18</sup> This particularity had important consequences in the relatively slow modernisation of the Spanish tobacco industry, and in the fact that the industry’s labour organisation was mainly based on a skilled and flexible female workforce.

<sup>19</sup> The anti-cigarette movement was more active than those articles and opinions show, manifesting itself for example in Henry Ford’s policy of not hiring workers who smoked cigarettes. In the US, even in an opera representation of “Carmen,” the protagonist’s job as a cigarette maker at the tobacco factory of Seville was substituted by that of a dairy worker. For more on the anti-tobacco movement, see Tate, (1999: 12,20).

<sup>20</sup> The creation of the Trust in 1890 as a consequence of a bitter competition described by the Supreme Court as “fierce and abnormal” had influence the history of every branch of tobacco industry in the US since the achievement of monopoly power was followed by Duke. He did not

supply-related changes, such as technical innovation, important changes in society and lifestyle also contributed to the rising demand for cigarettes. Urbanisation and industrialisation, and the consequent rise in living standards, coincided with the arrival of mechanically made cigarettes that made tobacco fashionable, available and cheap.<sup>21</sup> Other factors, such as the commercialisation of a safety match, and the fact that it was cleaner than other tobacco products, made the cigarette far more convenient than chewing tobacco for an urban society. Urban standards of hygiene and decorum discouraged spitting, a necessary adjunct to tobacco chewing, the most common form of tobacco consumption in the US before the advent of cigarettes. Throughout the first decades of the 20<sup>th</sup> century, the entire world converged towards one type of tobacco product: the cigarette (Gálvez, 2005). This pattern was especially evident after the First World War, mainly for the United States, and everywhere with the continuous technological improvement putting in the market cheaper products, which in addition came to be highly publicised. The mechanisation of the tobacco industry implied the transformation and harmonisation of the organisation of production by gender worldwide.

The Bonsack machine was rapidly adopted in countries as the US or the UK. The Bonsack machine permitted to reduce unit costs and thus put a cheaper product onto the market. It was the competitive advantages afforded by their use of the new Bonsack machine that gave Wills in the UK and Duke in the US their superiority over other companies operating in non monopolistic markets since both producers secured preferential rights with the Bonsack Machine Company. In 1890 Duke had been willing to pay over to the Bonsack Machine Company one-twelfth of his initial cigarette profits for exclusive use of the machine. Although important changes in the speed of cigarette machines did not come until the 1920s and 1930s as it is possible to see in Chart 1, the Bonsack machine was constantly being improved. If the first mark was that of 200 cigarettes per minute, in 1913 it came up to 450. However, cigarette machines were a case of multiple, simultaneous invention and were easy to manufacture. Rival machines, although less efficient were produced everywhere and used by other firms. The French state monopoly used slower Decouflé machines, and the Spanish monopoly, Vilaseca machines which were more suitable to the square cut tobacco preference of Spanish consumers. The Ikegai Ironworks, in Japan, had difficulty manufacturing western textile machinery to the required tolerances, but could turn out dozens of copied cigarette machines at ¥400 (\$200) each by 1899/1900.<sup>22</sup> That simultaneous invention helps to explain the spread of cigarette production and the gradual substitution of other types of tobacco consumption by cigarettes in the first third of the 20<sup>th</sup> century, together with the feminisation of the workforce.

For authors like Zimtzewitz (2003), a consumer shift away from other tobacco products and towards cigarettes in the first quarter of the 20<sup>th</sup> century in the US could only be explained by reference to the rapid rate of innovation of that American tobacco industry developed within a competitive market. This was especially true once the American Tobacco Company had been broken up in 1911.

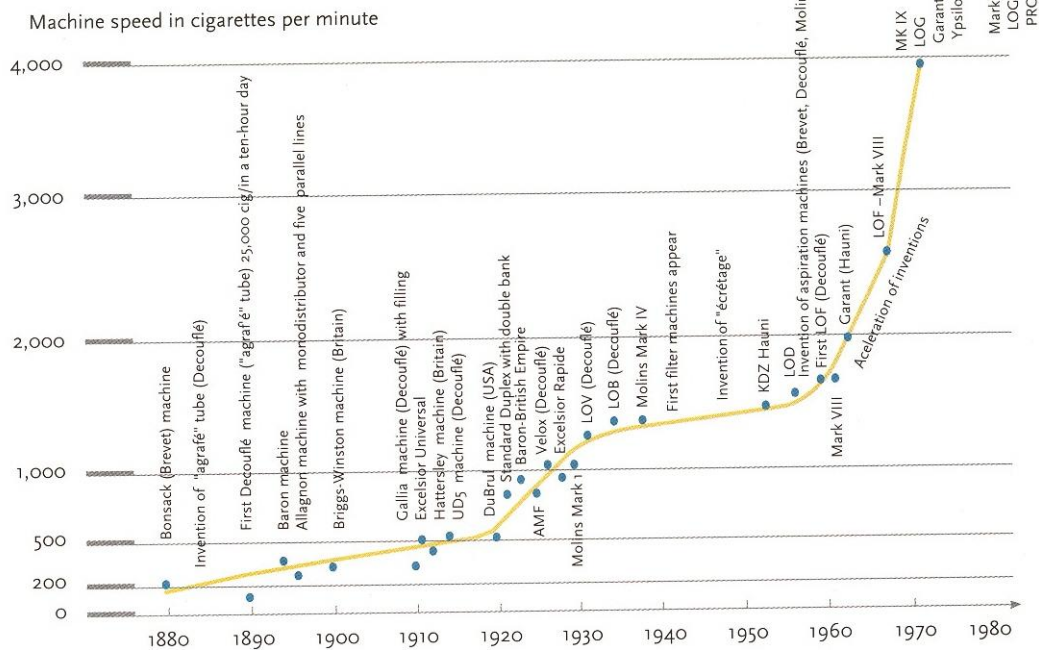
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achieve it in cigars because machinery for making cigars had not been developed to such an extent as to disqualify the small manufacturer before the dissolution of the Trust in 1911 (Evans 1938: 10).

<sup>21</sup> Goodman (1993: 94), maintains that the statistical evidence –without providing any– does not support a correlation between the level of industrialization and per capita income and cigarette consumption.

<sup>22</sup> For the productivity differences on cigarette machine (Hannah, 2006)

Chart 1 | A Hundred Years of Mechanisation



Fuente: Comín and Martín-Aceña (1999)

Labour productivity in tobacco products increased at 2.5 times the rate of those in manufacturing as a whole from 1899-1939, and was faster than in industries such as metals, petroleum, refining, chemicals and transportation equipment.<sup>23</sup> However, Hannah (2006) reduces the effect of the Bonsack machine and criticises the superiority in productivity of American tobacco industry before World War One. For Hannah, the Trust created by Duke brought the initially high rate of productivity growth, driven by mechanical innovations induced by competition between its predecessors, down to modest levels: "Even this may have been illusory: the recorded increase in "value added" in the decade of full trust control probably derived more from increased monopoly profits than from enhanced efficiency" (Hannah, 2006). Before the First World War the pattern of consumption in the US was far from homogeneous. In fact, a pattern of consumption that has been held in Europe to explain low productivity compared to the US. Furthermore, he explains how productivity was not higher in US tobacco industry than in other nations such as France tobacco production or British cigarette production. Table 2 shows the results of the productivity calculations made by Hannah based on Madsen (1916) data. This author insists that at this time the typical American manufacturing worker produced about twice as much as the average British or German worker, three times as much as the average French worker, ranging up to nearly nine times in the case of the Japanese (Broadberry 1997: 48-57). The output-per-person-year figures for tobacco in table two, by contrast, show something different. In addition, there were a wide range of other mechanical progress in other phases of tobacco production such as curing, drying, compressing, stemming, fermenting, ageing, conditioning, damping, stoving, cooling and cutting leaf, saucing,

<sup>23</sup> The tobacco industry was at that time one of the most rapidly evolving industries, and a competitive market existed in the US and the UK where the Bonsack machine was first introduced. For Zitzewitz (2001: 1-33), this competition framework was essential in explaining long-run productivity growth in the UK and US tobacco industries, although these two markets were far from having competition.

twisting and shaping plug, pulverizing snuff, and the final packaging. And later on, the mechanisation also affected the cigars. Hannah (2006) has calculated Duke's Bonsacks, saving the work of 1,080 hand-rollers in 1887, contributed only 1.5% of the productivity improvement in US tobacco manufacturing in the 1880s.<sup>24</sup> For this author, Bonsacks were ten times more important for Britain, with twice as many machines installed in a tobacco market less than one-fifth the size.<sup>25</sup>

Hannah (2006) when trying to demonstrate the lack of superiority in the productivity race by the US tobacco industry before the WWI, uses gender in order to compare productivity without gender penalties. He assumes men's wages everywhere being around twice those paid to women. As a matter of fact, he makes in the second column of Table 2 an adjustment for this on the assumption that half the wage differential was due to gender prejudice. Taking into consideration that "in America tobacco was still (just, at 52%) largely men's work whereas tobacco operatives in the rest of the world, as devotees of *Carmen* know, were predominantly female: around 95 % in Spain and Italy and 87% in France". For him that shows the US in uniformly poorer light. In fact, it was France the most productive country showing some characteristics which has been considered in the historiography as "American" and being identified with the US superiority in productivity: the existence of a professional management and of a standardised product, the *scaferlati* (cut tobacco for pipes and roll-your-own cigarettes) and the cigarettes made from such tobacco accounted for 81% of production by weight and 76% by value. In addition, France had 87% of female workers compared to 52% in the US. This is so because in France no substitution was needed since female labour was in charge of tobacco manufacturing at least from the 18<sup>th</sup> century, as corresponding to monopoly countries as it has been explained in part one of this paper. In addition, consumption patterns were different. In countries without monopoly such as the UK, the faster acceptance of cigarette explains why the gender share of tobacco labour force favoured female being -following Fitzgerald and Hirao (2005)-, 73% of total tobacco labour force in 1912.

The same idea that Hannah had in mind when comparing different productivities was also certainly in the tobacco employers minds especially in a period in which it was not un-politically correct to declare the hiring of women for labour cost reasons. The expansion of cigarette production and the cigarette machines was done using female labour, in order to reduce labour cost and to reduce workers bargaining power. For Duke,

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<sup>24</sup> "We can measure its overall impact more precisely in 1889, when Duke discontinued hand-rolling. That still meant employing 350 girls on making and packing the cigarettes, in addition to the workers in the earlier stages of tobacco preparation, so the impact on total employment was less than the 48:1 ratio of the output of one machine to one skilled hand worker would suggest. The early machines required a loader, an operator and a catcher, though this was eventually reduced to one, or, on faster machines, two attendants, with the help of a skilled development engineer. His annual commission, equivalent to the wages of 70 girls in 1889, negated some of the savings, but the local women and girls now employed were paid less than half as much as the skilled immigrant males that Duke had employed on hand-rolling. Duke's twenty four Bonsacks of 1889, producing 834 million cigarettes, were replacing 1,080 hand-rolling jobs" (Hannah, 2006)

<sup>25</sup> Fitzgerald and Hirao (2005) shows how in Britain, tobacco workers were at the bottom of the industrial pay scales. To what extent that should be explained by a predominant female labour force it is something that should be researched. The rise of mass production in the decades before 1914 created the semiskilled cigarette-machine operator, as well as large teams of labourers, packers, and deliverymen. After 1917, it began to recruit cutters, stovers, and male spinners, as well as craftsmen. In the UK men worked 48 hours per week and women did 45, and normally were sent back home after they married.

the decision of adopting the Bonsack machine created unrest among Duke's workforce, and many hand-rollers came back to New York where –together with Tampa- the cigar production was concentrated in the US. That became an incentive for Duke for changing its labour force (Cox, 2000, 28). The substitution of male by female in countries in which female labour was not abundant before the mechanisation process was consequence of two processes. First, the triumph of the cigarette over other tobacco products. All workers entering in this new mechanical workshops and factory used to be young women who did not need an especial qualification, were easy to substitute and were cheaper than men. As cigarette consumption increased other tobacco products were declining especially the cigars producing unemployment and de-qualification among male cigar makers. That was clearly the case in Cuba and in the US. In Cuba, other aspects such as the deindustrialisation of the country and the economic colonisation were important too (Stubbs, 1989). In the US, the reduction of cigar makers workfoce was of 62% between 1920 and 1936, however cigar production increased between 1900 and 1920 (Evans, 1938). Second, the arrival of first semi-mecanic and later on, mechanic, cigar machines who also were operated by women. At least women continued to work in mechanic workshop and on the mechanic stripping. In the illustration 5 is possible to see how the publicity of those machines included already a woman operating it. Different tasks within the tobacco industry were increasingly becoming either male or female.

Table 2. Productivity in Manufactured Tobacco, ca. 1912.  
Output per person employed (to the base US = 100)

	Weight of output	Labour "quality" adjustment	Product "quality" adjustment	Both Adjustments
Francia	185	208	134	151
Austria	121	na	117	na
UK	118	127	155	166
Canadá	105	na	na	na
USA	100	100	100	100
Italy	89	101	152	174
Austria	84	95	99	112
Spain	74	84	98	111
Japan	71	74	54	56
Germany	49	52	92	98

Sources: Hannah (2006).

After the important initial changes with the arrival of the Bonsack machine, the cigarette industry suffered comparative minor changes than the cigar manufacture. In fact, it was on cigar manufacturing where some of the most important changes regarding the gender division of labour occurred. Cigar making machinery was used in the manufacture of low-priced cigars where a steady demand was assured. Manufacturers were attracted by the substitution labour-cost saving made possible by use of short-filler cigar machines. It was not until 1917 that the long period of research was fruitful and the first cigar making machine was in the market. However, the introduction of these machines required a scale which was not the norm in the cigar manufacture. In 1921, 70,6% of all production was done by 1418 factories (Evans, 1938: 11). The shrinking market following 1920 and the sharp competition it engendered made economies in manufacturing costs most important. In this situation the labour-cost saving offered by use of cigar machines proved a decisive factor. But these machines were installed in the larger factories only. As a result, the smaller concerns were at a competitive disadvantage and wages were cut. That explain a strange phenomenon, women not only continued to be demanded for factories producing machine made cigars, but also for smaller factories where hand manufacture was still the norm. By

1936, there was a reduction not over 60% from 1921. The major responsible from concentration was not market decline but mechanisation. (Evans, 1938:13). Improvements in manufacturing techniques would have caused displacement of even more than 22,000 workers had this effect not been in part compensated by reduction in the average hours of labour. The decrease in the volume of production is estimated to have caused the displacement of other 34,000 workers.

Illustration 5. Universal Machine



Sources: Commercial book from Universal Machine (Gálvez, 2000, 51).

The decline in the cigar consumption market following 1920 engendered severe competition in the industry. The efforts of manufacturers to maintain sales volume in a shrinking market made price cutting inevitable.<sup>26</sup> Women were luckier than men in keeping their jobs since they were preferred for machine-made cigars and for hand made –except the higher quality ones which have the quality appeal of hand made– since wages were smaller than in mechanised factories. Mechanised factory wages were relatively stable and not markedly out of line with those paid by other industries in similar localities for comparable types of labour. In the hand branch of the industry, on the other hand, the constantly increasing number of hand cigar makers displaced from the industry and thrown on the labour market has created an oversupply of such labour. No longer in a position to bargain through their union for relatively high wages. That the explanation of why women stayed more than men as hand made cigar manufacturers. Although, other explanations were given: “The machine has caused the replacement of men by women to a great extent, some men refused, quite consistently, to operate the machine”.<sup>27</sup> These jobs were not considered suitable for men, and, on the other hand, the men were dissatisfied with simple machine operations and their attendance wage. Cigar machine operators have always been women: “Some superintendents went so far as to say that cigar making and packaging should never have been a man’s job, as women were much better fitted for it”.<sup>28</sup> However,

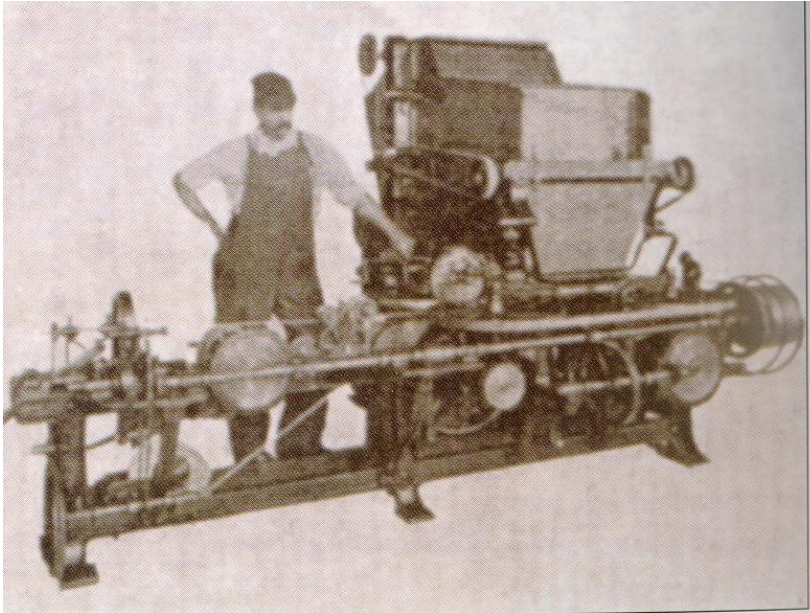
<sup>26</sup> In per capita terms cigars began to lose favor with the public as early as 1907. Evans (1938: 2).

<sup>27</sup> United States Department of Labor (1932: 3).

<sup>28</sup> United States Department of Labor (1932: 36).

in plants in which the direct labour were almost exclusively women before the change to machine equipment, more men than formerly were needed as machine fixers, foremen, and mechanics, but few of these had been cigar makers before.

#### Illustration 6. The Publicity of the Bonsack Machine



Source: Anuarios Estadísticos del Tabaco (several years)

That was also the case in the monopoly countries, where total labour force also decreased but the percentage of male increased since labour saving techniques were applied over female jobs and not over male jobs as the mentioned case of the US. In the Spanish case, the reduction of female workforce was 70% from 1887 to 1945. What is interesting, that gender is an important element in order to explain how this transition from hand-made to mechanically made cigars and cigarettes was less traumatic if labour has been male. Lipartito (1994) has found similar strategic behaviour in the shift from educated ladies to mechanical switching devices in the Bell Telephone Company, a sprawling monopoly composed of dozens of regional firms that dominated telephony in the US from 1880 to 1894. For Lipartito, locating technology in its various contexts makes change far more problematic and far less deterministic than it is in either Marxist or neo-classical economic models. Managers and engineers generally lack total control over innovation. They proceed with imperfect knowledge, and they concentrate resources on making incremental improvements to existing technology. They build strong systems that follow historically determined patterns of change derived from previous events and choices. Often, the interests of workers, consumers, and politicians coalesce around these evolving systems. Such vested interests reinforce the tendency of technology to follow its existing trajectory. Subject to these powerful forces for inertia, techno-labour systems respond slowly to change, as it was indeed the case with CAT, the private company managing the Spanish fiscal tobacco monopoly.

The reduction of the workforce was done smoothly and without firing any workers, helping CAT which has the concession on the tobacco monopoly since 1887 to avoid any questioning of its management. The instability of a drastic reduction of personnel would have exposed the local labour markets to high unemployment and instability, and would have been a measure against the principal, that is, the State, despite a drastic substitution of personnel by machines would have furthered faster the objective of the lease, which was to

increase profits and tobacco revenues. The CAT did not need to fire any tobacco worker they just stopped hiring new *cigarreras* for more than twenty years. Spanish consumers did not easily accept mechanically made cigarettes and preferred hand-made which normally had more tobacco inside. So the substitution was not immediate. The flexible attendance or the maintenance of absenteeism among the *cigarreras* –who mainly were married women- in the factory during the industrialisation period, illustrates the business mentality of the CAT and its capacity to adapt to the circumstances looking for the most profitable solution.<sup>29</sup> Sometimes this was because of the collusion between the flexibility needed by the company and the flexible use of time needed by the *cigarreras* to accomplish their household tasks, and sometimes these practices became the lesser of two evils as an alternative to firing workers and creating a social uproar.<sup>30</sup>

This slow path towards modernisation which altered customers' habits whilst avoiding social disorder was largely possible thanks to the firm's monopoly structure and to a flexible mode of production and flexible labour force.<sup>31</sup> This industrialisation process has passed to the historiography as non-traumatic, because there was no massive firing process and no violent workers' demonstration, in part because the workers were integrated much later in Union organisations. It has been suggested that it was so because the company had a paternalistic behaviour due to its liaisons with the State. The limitation of this interpretation lies first on not taking into account a gender approach and studying the worker outside the family, and second, on its failed attempt to analyse the relationship of capital and labour always in terms of permanent conflict. The workers were, in the short-run, profiting from this slow transformation since they could maintain a flexible labour organisation. All this could be possible under the umbrella of the unique relationship with the State: concession of a monopolist position; profit maximisation and social order mandates. The state and the firm's monopolistic structure played an essential role in allowing the mechanisation of production to coexist with *cigarreras'* absenteeism behaviour. Although the State can be expected to be more interested in maintaining social stability – and especially in this case, owing the importance of tobacco factories in their various local labour markets-, it is the firm's monopoly structure than the interventionist power of the State that explains the caution employed in the performance of the CAT's two main strategies, mechanisation and reduction of the labour force. The monopolistic character of business permitted a control on prices, but also sought a cost-based pricing policy.

If in the US hand cigar makers have in general not been employed as cigar machine operators, in the Spanish case the old cigar hand made workers were not converted to machines but they new workers were their daughters, that explain why the cigar makers accepted the machines. Since the arrival of the CAT there was no hiring for more than

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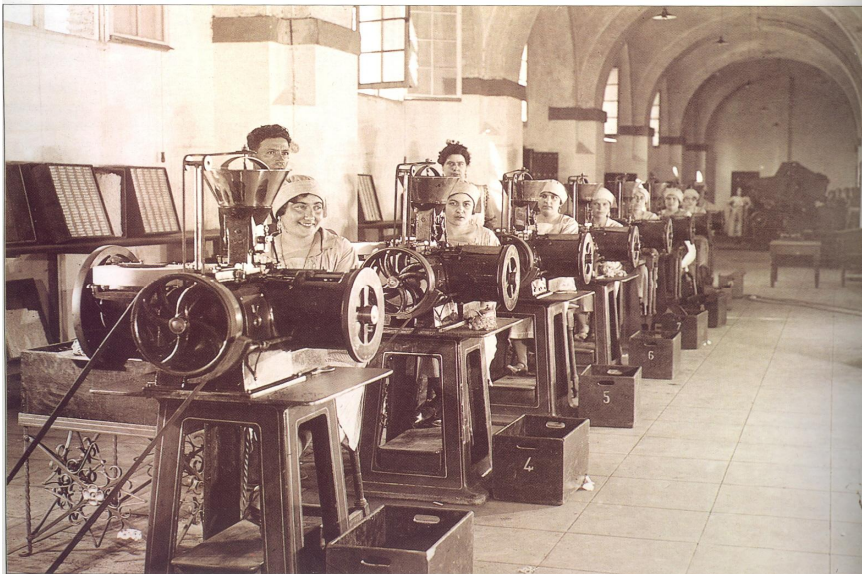
<sup>29</sup> Because *cigarreras'* absences was a real issue for management, collected in their documents, that it is possible to use the term absenteeism when referring to the *cigarreras'* absences, even under a piece-work remuneration system.

<sup>30</sup> Through the study of the financial aspects of the companies it is possible to know whether companies profited or not from non-attendance. Barby, Orme and Treble (1990,1994) have demonstrated the potential importance of considering the financial aspects of the firm and the attendance control in explaining absenteeism behaviour.

<sup>31</sup> Independent of the lese of the right to a state monopoly by a private company, the fiscal monopoly involves a distortion in the allocation of resources related to the competitive model. In fact, when the management of a monopoly is run by a private company, the subjection of the company to the private right does not imply that the company develops a private activity, the main characteristic of the company activity is derived from the existence of the monopoly, which determines its dominant position in the market.

twenty years. Only if the *cigarreras* accepted the machines in the factories their daughter will be hire. When the mechanisation concluded in most of the countries the gender division of labour was more or less homogeneous. Women were in mechanically made cigarette and cigar production, stripping and packaging, while men were in charge of some tasks in the preparation phase, general maintenance of factories and acting as mechanics for the machines and supervising the workshops. When the cigar-making continued to be manual was manufactured either by male, mainly in non monopolistic countries like Cuba or in luxury products as in the US, or by female in the monopoly countries, or in cheaper hand made cigars in the US. The next illustrations show some of those differences.

Illustration 7. Cigarette makers in the tobacco factory of Seville, 1920s



Source: Archivo de la Fábrica de Tabacos de Sevilla

Illustration 8. Mechanic stripping at the Tobacco Factory of Seville (1930s)



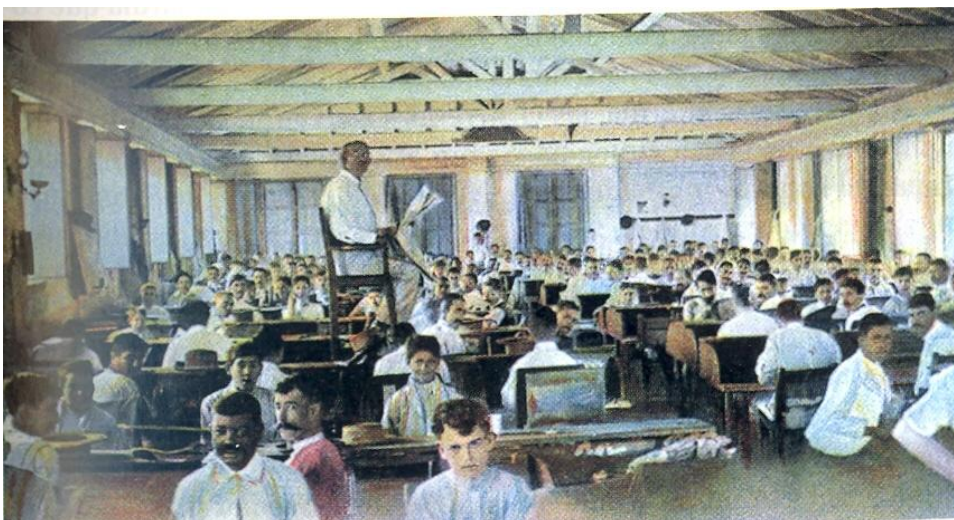
Source: Archivo de la Fábrica de Tabacos de Sevilla

Illustration 9. Workshop for tobacco leaves preparation. Fábrica de Alicante



Source: Archivo y Biblioteca de Tabacalera

Illustration 10. Cuban cigar factory



Source: (Alonso, 2001, 75)

The feminisation of tobacco industry came in the first place as a solution to be as efficient as possible in monopoly countries within the bounds set by the concentration obliged by tobacco fiscal character. In the second place, the feminisation came with the mechanisation and hand to hand with disqualification and labour cost strategies. In both moments, the main characteristic of female labour: cheaper than male labour was the key issue. Technological innovation was female in tobacco industry.

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