The Role of Women in Industrialization

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Industrial Revolution arose in Europe as a consequence of very specific conditions for its realisation, which were created in the course of the historical development. One of these characteristic European traits, which differed from those in other high cultures, was the comparatively strong position of women in society. There arises the question, wether this fact caused repercussions for the Industrial Revolution.

Already in the Middle Ages the close cooperation in production within the frame of monogamic matrimony provided higher income. But the favourable position of women in society made possible also independent work, primarily in the towns and made generally possible gainful work outside the home. The comparatively high education of mothers caused well educated children and consequently workers.

But the most important factor for the Industrial Revolution represented the big female labour force, able to perform work outside the house. The two leading branches of the beginning of modern economic growth were textiles and iron. The dynamic expansion of the former was made possible predominantly by female labour with its "swift fingers" and low wages. On the other hand this gainful work improved the social position of women, the more as their labour force participation expanded subsequently into other sectors of production and services. And the same development can be observed in newly industrialising countries. So this process may be described as the capitalist model of female employment.
1. The Process of Industrial Revolution in Europe

Two problems were frequently discussed in recent years. One dealt with the institutional determinants of European Industrial Revolution (Jones, 1981; North 1981; Rosenberg – Birdzell 1986; Landes, 1998; Butschek, 2002). The other concerned the role of women in economic development (Beneria – Savitri, 2001). In this context it seems useful to raise the question whether and in what way women influenced and influence economic development and, on the other hand, are there repercussions of industrial growth on the social status of women. For that aim it seems adequate first to analyze the long-run determinants of industrial growth, and secondly to confront them with the social position of women in the different societies.

1.1. The Cradle of European Individualism

The traces of the Industrial Revolution can be pursued back to the antiquity, to its European representatives: the Greek City States and the Roman Empire. There arose the first elements, which turned out to become the conditions of the future economic development.

The Greek City States were under either oligarchic or democratic government, i.e. the citizenry was involved to a greater or lesser extent in the formation of political will. The societies concerned already incorporated the creation of well-defined property rights ensuring free disposition over land, capital and (in the form of slaves) labor. This enabled the development of a money economy with agricultural and craft-based production and already extensive trade (North, 1988, p. 107). A very considerable degree of legal security kept down transaction costs and created the conditions for the fundamental elements of economic growth as formulated by Adam Smith: market expansion and the division of labor. It also created a certain degree of scope within which the individual was free to act politically, but above all economically.

Although the system of Greek City States fell into declines many later political forms in this region adopted the structures of the polis, and this included Rome. Despite frequent social clashes Rome never developed into a democracy. Nevertheless, many egalitarian elements are undeniably discernible: forms of wording such as Senatus Populusque Romanus or the description of the Emperor as primus inter pares indicate such an awareness. What can definitely be said is that the relationship between central administration and citizen (the cives Romanus with separate legal personality) was different from that in non-European cultures. The development of the law proved absolutely fundamental to the Europe of the future. For Rome created not only likewise well-defined property rights but an extensive body of private law whose essential features have remained valid up to the present day.

But in spite of these comparatively favorable circumstances, economic growth in the sense of Kuznets never took place, because three decisive conditions were lacking: technical progress, entrepreneurial dynamics and the high social esteem of labor.

But precisely the latter arose already during the late period of the Roman Empire and in the early Middle Ages. This process was very intimately linked with the Christian religion. In classical Greece as well as in
the early Roman Empire any kind of productive labor was despised. This attitude changed fundamentally with the advent of Christendom: "pray and work" became the most important prescription for the believers. In complete contrast to antiquity, idleness was regarded as something detrimental. Christianity elevated work to the status of a moral duty. But it was not only this high esteem of – physical – labor, which was decisive for the development towards the Industrial Revolution, because already Scholastics developed a dynamic attitude towards work. It should have been done not only honestly, but rational and successful. This approach was notoriously intensified by Protestantism (Sombart, 1923; Frambach, 1999).

1.2. The Dynamics of the Middle Ages

The static of the Antiquity was contrasted by the Middle Ages. Their political system in Europe was characterized by feudalism. In principle, it arose from a deficiency. The early mediaeval kingdoms were not in a position to build up a central administration, a taxation system and a corresponding army such as had been the features, or were still the features, of the Roman State or other advanced cultures such as China. Instead, the territorial rulers deputed military functions (feudal military service) together with administration and jurisdiction to retainers who were each granted, in return, the right of usufruct over a tract of land. These manorial landlords, in turn, allotted parts of their grant of land to serfs, who cultivated it as payment.

This already marked the advent of a key element of the European institutional system, namely, the juridification of social relationships. They were based, in essence, on contractual rights and obligations: in return for certain forms of labor performance and dues rendered by the peasants, their Landlords provided personal protection, administration and lower jurisdiction (Rosenberg – Birdzell, 1986, p. 62).

What was decisive for the subsequent institutional structure however, was the emergence of the European city. It developed from markets and market regions. Market privilege, usually royal, guaranteed the latter immunity from the surrounding countryside and granted them the right to establish their own courts and to create law. Furthermore, very early on the actual market participants gained influence over the administration of the market, since its founders had a considerable interest in attracting traders and craftsmen. All of these nascent features come to full fruition in the mediaeval European city (Bindseil – Pfeil, 1999). Its political system gradually developed into a form of "governments of the merchants, by the merchants, for the merchants" (Lopez, 1976, p. 70). Although this was as a rule confined to the well-to-do strata, within these strata it was conducted on essentially democratic lines.

A major contribution by the city to the institutional structure which made industrialization possible consisted in growing legal security. Disagreements in commercial life were brought before the courts for settlement. Burghers were free as a matter of principle ("Stadtluft macht frei, Landluft unfrei"), and were able to feel safe from arbitrary intervention by a feudal landlord or territorial ruler. In this atmosphere it again became possible to develop, in contrast to the part-ownership of feudalism, well-defined property rights which apart from allowing an expansion of trade also strengthened the incentives for economic activity. However, this institutional structure led to increased individualization of the city burghers since he
was thereby singled out not only from society as a body but also from the kinship group or extended family (Dilcher, 1996, p. 295).

Economic activity in mediaeval cities was carried on within varying institutional frameworks. Production and regional trade were organized in guilds. Although these were also self-governing bodies, they controlled the conditions for production and trade very strictly. Production methods, product quality, prices and customer groups were all fixed, as was entry into the trade concerned and the number of skilled artisans and apprentices.

The manner in which inter-regional and international trade developed was in total contrast to this. Here, leaving aside the taxes and duties which were levied on trade channels, the co-ordination of supply and demand was effected through the market itself. It must not, of course, be forgotten that the intensification of these trade relationships brought with it new institutions – a commercial moral code – which reduced entrepreneurial risk and lowered transaction costs. Observance of these moral standards was originally achieved without any form of state intervention (Rosenberg – Birdzell, 1986, p. 114). Given that in the case of industrialization of the guild system the best that can be achieved is to re-create its legal nature, it was inter-regional and international trade which pointed the way to the future system of market co-ordination.

The second half of the Middle Ages witnessed a decisive transformation among the urban citizenry (and in the monasteries) in the way in which Europeans measured reality: a change of mentality. This change is described as the "quantitative revolution" (Crosby, 1998). Although it found expression in diverse ways, it was always characterized by a quantitative approach to problems.

Examples included the "linearization of time", which was made possible by the invention of the mechanical clock; the plotting of reliable nautical charts and land maps; the adoption and successful further development of Arabic mathematics; the development of double-entry book-keeping; the introduction of perspective in painting; and the invention of music notation, which divided melody into temporal quantities and fostered polyphony. All in all, it heralded the transition from the mystic view of the world of the early Middle Ages to the rationalism of the Enlightenment. And this change of attitudes found already its expression in a growing amount of technical inventions as well as innovations.

At the end of this development there stood a new man. The urban citizen did not try to increase his utility by force against others, by rent seeking, but by production, services and trade. And the central element of this process lay in the dynamic character of his commercial activity. He did not combine the factors of production according to inherited rules, but explored new possibilities to reduce costs already by the use of technical and organizational progress.

1.3. Political Frame and Spiritual Background

With the change in military techniques, the feudal system came to an end. The development of firearms, in particular, meant that armor-clad horsemen lost their combat effectiveness. Of their responsibilities towards the peasant farmers under their control, the landlords retained only administration and lower
jurisdiction, protection and security increasingly became the province of centralized power: state monopoly of the use of force began to emerge.

From this point on, in order to fulfil their military ambitions territorial rulers were compelled to turn to different ways not only of raising armies but, above all, of financing them, which implied finding new financial resources, mainly taxes. Since these new revenues had to be fixed, collected, supervised and managed, they necessitated an extension of the administration system. Thus, the loss of the nobility’s military importance and the new financial requirements led to an increased tendency towards the formation of the central state.

But the phase of the transition to mercantilism included not only the expansion of central administration but also the unification of the legal system. Territorial rulers increasingly changed over to regulating whole areas of life in society by means of laws.

The essential contribution to economic development in this epoch was that made by the new position taken up by the state with respect to the national economy. In the past the state had concentrated its efforts in order to generate revenues on extracting funds. Under the influence of mercantilist writings, there now came a complete change of thinking. Governments took explicit cognizance of the relationship between the level of economic activity and tax revenues. In political terms, the consequences of this realization consisted in fostering the economic expansion of the state in question: for the first time there emerged something like a coherent economic policy.

The fundamental aim of this policy was to maximize the national product. That was to be achieved by increasing production. Economic growth was also to be fostered by protecting the national market against foreign competition. Surpluses on the balance of payments were to be achieved in order to build up a reserve of precious metals. To this end, countries created commercial authorities which were responsible for implementing economic policy. National territory was fused more or less into a single economic area with tariff protection against the outside world. The infrastructure was built up, schools were established and compulsory school attendance introduced, and the beginnings of a social policy were put in place.

Trade with distant countries, which had in any case enjoyed princely favor since the Middle Ages, was now directly promoted, partly through foreign-policy or military activities and partly through the formation of trading companies (Pohl, 1999, p. 154). The deciding factor, however, was the breakthrough in goods production: the guild system was largely broken up by the central authorities, and forms of production outside its area of operation were established. The manufacturing system was born, i.e. goods production which, although still predominantly based on the labor of skilled craftworkers, grouped together a large number of such workers under one roof and thus allowed the control and targeted organization of production. Of even greater importance was the outworking system, in which predominantly middlemen supplied raw materials to individual rural processors and, after the goods had been manufactured, took charge of the marketing process. All these entrepreneurs no longer satisfied local demand but supplied external markets. This meant that entrepreneurial experience was accumulated not only in foreign trade but also in terms of production. Lastly, the state did not stop at merely promoting production in various ways but also changed over to setting up enterprises itself, in
some cases with considerable success.

The intellectual background against which this economic policy developed was the Enlightenment in which the attitudes of the Middle Ages as portrayed above had taken firmer shape and which dominated 18th century thinking to such an unchallenged degree that not only the general citizenry but also members of the nobility and the clergy right up to territorial rulers such as King Frederic II of Prussia and Emperor Joseph II subscribed to it. It saw itself as the ideology of "reason", i.e. rational thought, in contrast to one governed by religious thinking. The concepts which flowed from it were high esteem of the individual, equality before the law for all, and the perception of the state as a social contract.

Obviously, this climate of rationalism was highly conducive to scientific thought, that paved the way to the "scientific revolution", which proved to be the main element of the development towards the Industrial Revolution. In sciences the abstract interpretation of antic authors was substituted by the observation of the real world and finally by experiment. The start with Tycho de Brahe, Johannes Kepler and Galileo Galilei found its climax with the mechanical system of Isaac Newton. A scientific community cultivated the permanent discourse.

1.4. The Great Breakthrough

Towards the end of the 18th century the Industrial Revolution got under way in Britain and in the following decades was quickly followed by similar transformations in the USA and Continental Europe. Although even then per capita income in Europe exceeded that in other civilizations (Maddison, 2001, p. 264), the differences did not become immediately obvious but subsequently manifested themselves increasingly strongly. This marked the onset of the process which Kuznets called "modern economic growth" (Kuznets, 1966). The entire economic and social structure underwent a profound transformation. Agriculture, which previously had dominated the whole productive apparatus, increasingly declined in importance in the decades which followed. Its place was taken by industry. The latter's main feature was the factory, an organization which not only brought together a large number of workers in a single place but in which production was based on the use of machines whose operation applied new means of inanimate power. Whereas formerly the bulk of the population had been country dwellers, the city now became the focus. Illiteracy was increasingly reduced as a result of education of various levels. Egalitarian elements infiltrated the hierarchical structures of society: "The Industrial Revolution also transformed the balance of political power – within nations, between nations, and between cultures; revolutionized the social order; and as much changed ways of thinking as ways of doing" (Landes, 1998, p. 187).

The symbol of the Industrial Revolution became the coal-fired steam engine. In this there had been created the prime mover which not only produced an incomparably higher power than all previous sources but, above all, was independent of location. This invention resulted of the very specific atmosphere of the time, in which encountered the science with the broad interest of the population in technical progress as well as commerce. It found expression in numerous technical societies such as, in Britain, the Royal Society. Within this context scientists engaged in debate with interested laymen, many
of them had experience of economic activities. It was precisely such amateurs who successfully made the most important inventions and hence set the Industrial Revolution in motion.

And it is here that at least a possible answer is to be found to the old and much-disputed question. "Why was Britain first?" For whereas in terms of actual inventions the latter was surpassed at that time by France, nowhere else was interest in technical and economic matters, i.e. relevant debate, as widespread as it was in Britain (Mathias, 1969). This climate fostered the rising generation of early inventors: "From his days as a young apprentice in London James Watt participated in what we came to see as the distinctively British culture of applied science" (Jacob, 1998, p. 69).

Out of this constellation arose the three central elements of the industrial development: first the technical revolution with its machines and the use of energy, secondly the traffic revolution, for the first time in history the mass transportation of people and goods overland became possible, as a result of the steam railways. And finally there occurred the information revolution, which started already with the improvement of the means of transport, but found its vivid expression in the invention of the telegraph.

The production process was driven forward by a few leading sectors. The major technical breakthroughs took place first in textiles and iron and steel industries. These were followed by mechanical engineering, and it was not until the second half of the 19th century that chemicals and electrical engineering were added and to embrace finally the total array of contemporary industrial production.

To sum up: the conditions for industrial progress were first of all the high esteem of labor in society, further the existence of individualistic, responsible, reflective and initiative type of man, which could provide entrepreneurs, scientists as well as judges and administrators. The society must be characterized by science and technical progress, by a scientific community, which permanently discusses and improves the result of research. Entrepreneurs avoid rent seeking and try to maximize their profit by the using technical and organizational progress to reduce costs or to introduce new products. Finally there should exist a working legal system, which reduces transaction costs and secures economic dispositions. And these conditions are valid not only for the past, but likewise for the presence (Butschek, 2002, p. 164).

2. Catching Up or Stagnation

2.1. The Static Extra-European Cultures

So the fulfillment of the conditions answers first of all the question why the Industrial Revolution took place in Europe, and why only in Europe. For we find that these crucial determinants of industrialization failed to develop in the comparable advanced cultures, i.e. the Arab-Turkish, the Indian and the Chinese.

The distinguishing attributes of the capitalist type of man were far less pronounced there. In the non-European civilizations, with their large, unbroken land masses, central or territorial (usually despotic) power was able to maintain its grip time after time. This also applies to the cities, which were always dominated from outside either by central authorities or by aristocratic landowners with their non-
commerce-oriented set of values. Any kind of autonomous development comparable to that in Europe remained unknown in these regions. Nowhere, therefore, did a relatively free citizenry emerge.

This political repression was reinforced by religious forces, especially in the later Islamic Theocracy. That view of things preordained a policy under which scientific research (which in the early Middle Ages had reached a high point in the Spanish universities) was subjected to restrictions and, to this end, letterpress printing was prohibited in the Islamic world since it was only likely to assist the spread of undesirable ideas (Jones, 1981, p. 184).

And this also meant a block on technical development. In all of these civilizations, of course, and particularly in China, there were outstanding scientific achievements. But they never led to the onset of any process of industrial growth because scientific work was confined to a narrow circle. There was never any of the generalized and ongoing discourse which drives scientific knowledge forward. And this also precluded the development of a stratum of technically minded, dynamic entrepreneurs who could have translated the results of academic research into economic innovations.

Another key element of the difference between Europe and the Asiatic cultures is the rule of law. The ability of the central powers to assert themselves led to frequent intrusions into the private lives of their subjects. Although in different epochs and to a differing degree, time and again there were instances of arbitrary confiscation of assets. In such circumstances it was difficult to embark upon long-term, extensive investments nor deemed advisable to accumulate major assets. In India things reached the point where inhabitants built humble-looking houses in order not to attract attention (Landes, 1998, p. 157). This also made it difficult for a stratum of potential capitalists to emerge.

A further element which held back development was probably that in these civilizations subjects were taxed excessively (Maddison, 1970, p. 38). This meant that no resources could be accumulated for investment. Luxury consumption in the ruling strata of these civilizations, particularly in India, is said to have been far in excess of that found in Europe (Jones, 1981, p. 196).

2.2. The Asian Tigers

Especially the gross difference in military power, which led to the world wide rule of Europe, induced in extra-European countries many attempts to improve their economic position, to promote also an industrial development. Therefore some of them tried also to restructure their society according to the European model. The outstanding example was Japan.

Japanese society, similarly, kept itself sealed off from the outside world during the 17th and 18th century, it did, however, successfully adopt a few particular European products and manufactured them itself, such as spectacles and mechanical clocks. Already this demonstrated a certain willingness to learn. Furthermore, Japanese society exhibited a number of developments similar to those in Europe. For a start, there was a growing tendency on the part of feudal lords to monetarize the rent paid by peasants. In Japan it was also possible to flee into the city. And there, obviously, there also emerged an independent, commerce-based bourgeoisie who developed a specific work ethic. Seemingly there also gradually
developed a position of central power for state and economy similar to that in European Mercantilism.
Investment in the infrastructure began, with the purpose of promoting economic development. In addition,
a proto-industrialization unfolded on the basis of cotton processing.

The Meiji Restoration in 1868 was therefore able to build on a useful basis. There is no doubt that its
sweeping success was founded firstly on the eager adoption of European experience. But in the view of
Landes, Japan would have been the only region capable of implementing industrialization of its own

And in the past few decades also most East Asian countries have succeeded in setting a process in
motion following this pattern. Few of them proved to be exemplary democracies, but their political system
ensured scope for economic activity, together with the essentials of legal security, i.e. properly
functioning courts and administrative authorities. What is more, the more or less authoritarian
governments directed their policies at the economic interests of their respective countries and not, in
general, at serving a special clientele, nor (with the exception of Indonesia) was their aim massive
personal enrichment.

This was matched, on the part of the general population, by a notoriously high work motivation and a
similar eagerness to learn which was given full rain by a comprehensive education system. A strong
tendency towards thrift was also characteristic of these countries, as was correct behavior towards third
parties and the state. This informal institutional structure can also be traced back to historical traditions.
However, it was at the same time sufficiently flexible to accommodate adjustments to the new
circumstances of an industrial society without any social disruption. This provided a viable basis for the
emergence of a highly effective economic policy. These countries established an appropriate
infrastructure, agriculture was promoted, by measures including land reform. Industrial policy was geared
to properly functioning competition primarily at domestic level.

Although in the initial stages of industrialization a protective tariff policy was operated, this was gradually
relaxed and eventually replaced by an export promotion policy. High savings and investment ratios
facilitated expansion, which was not held back by high taxes or an excessive state apparatus (Schröder,
1999, p. 87).

| Table 1: Gross Domestic Product per Capita Growth Rates in Developing Regions |
|---------------------------------|--------|--------|--------|
| Average annual growth rates as percent |
| Eastern Asia | +0.1 | +3.8 | +3.2 |
| Latin America | +1.4 | +2.5 | +1.0 |
| Arabia | +2.5 | +3.6 | +0.4 |
| Sub-Saharan Africa | +1.0 | +2.1 | −0.1 |

The outcome of this particular set of circumstances is there for all to see: since the early seventies of the 20th century the “Asian Tiger” economies have grown more than three times faster than those in South America and eight times faster than those in Arabia whereas in sub-Saharan Africa gross domestic product per capita decreased.

2.3. The Persistence of History

In contrast to the Asian societies, the other cultures proved to be exposed to path dependence. The previously described static social determinants remained effective more or less up to the present. In these countries even today a bourgeoisie which is individualistic, willing to take responsibility, self-assured and entrepreneurial minded, is underdeveloped and an inadequate and corrupt legal system is virtually a characteristic of those regions. In many instances the development of human capital is still only just beginning and the societies are unsettled by social tensions. Their characteristic feature nowadays lies frequently in the lack of correspondence between formal and informal institutions. For political and economic legislation often has been more or less adapted to the European or American models. Yet informal institutions, that is, the unwritten rules which shape the behavior of economic subjects frequently deviate considerably from the laws, i.e. formal institutions.

The Arab culture, which had reached its pinnacle in the Middle Ages, was already experiencing its first setbacks towards the end of this period; and by the 19th century the Ottoman Empire had become the "Sick Man of Europe". And according to Landes, nothing about this has changed up to the present day. The oil-producing countries may be characterized by excessive wealth, but this has not led to an effective industrial development. To this day the Arab states remain dictatorships, in many cases with the uninterrupted influence of the Islamic clerics.

These countries were not in a position to train up a skilled potential labor force. The illiteracy rate is high – particularly among women, whose position in society there is deplorable anyhow. Just as before, the Arab countries are filled with distrust of the West's technologies or ideas. All this has repercussions on economic development (Landes, 1998, p. 393).

Such shortcomings are especially pronounced in sub-Saharan Africa. No bourgeoisie, no legal security, no scientific discourse. Incompetent governments, inadequate technology, poor education. These countries are characterized by poverty, hunger and disease. The average income is barely increasing at all. Wars between each other are the order of the day. Under the "kleptocracy" system the rulers seek to appropriate as large a proportion as possible of public revenues for themselves and transfer these funds abroad (Rowley, 2000). The population's achievement motivation is low; the individual is rigidly integrated within the clan – any activity he engages in requires the consent of its oldest member and he has to share his income with the group. Under the "kleptocracy" system a certain clientele enjoys special favor. This means that budgets are always in deficit and national debts enormous. Agriculture, which is in any case fairly unproductive, is far more heavily taxed in Africa than it is in other regions, partly because state purchasing monopolies make this easy to do. As a consequence it additionally paralyses initiatives in this sector (Schröder, 1999, p. 148). In view of the lacking of an adequate institutional structure the process of
industrial development either did not start at all, or showed a dragging character.

Of course the institutional analysis can be extended to other growth phenomena as for instance to the different development of North and South America as well as to the problems of the transition of the East European countries (Butschek, 1999), but for the purpose of this article, it is only necessary to provide the basis for the question, whether and how women influenced the industrial development.

3. Women and Industrialization

3.1. The Status of Women in Europe

In the foregoing an attempt has been made to sketch the essential features of the industrialization process. Stress has been laid on the fundamental conditions of industrial development. But there are certainly many additional elements, which foster or hinder such a process. If in the following the role of women in relation to industrialization is examined, then because it is another of the aspects in which European society differed significantly from the other advanced cultures.

In the latter, a woman was generally assigned a subservient function within the family and with respect to her husband. In accordance with Muslim beliefs, they were – in the upper layers – restricted to their homes, when appearing in public they had to be completely veiled (as is still the case today in many Islamic countries). In China they also had to accept physical disfigurement (bound feet), as they also did in many African countries (excision of the clitoris). In most of these cultures polygamy was the norm for – of course – the more prosperous groups of the population.

In Europe, on the other hand, women occupied a different position. Although within the family context a woman also had to accept subjection to her husband to a large extent, she was still recognized as a person in her own right. This had also been the case even in Antiquity: although this legal identity may have been mainly confined to the urban aristocracy of Rome and has represented the optimum possible situation, it is still a characteristic indicator of the position of women in Europe.

Under Germanic law, although the husband acted in the wife's name in all legal matters involving the outside world, within their relationship she possessed the authority to wield control through her "Schlüsselgewalt", i. e. her authority to act in her husband's name in matters concerning the household (Mitteis – Lieberich, 1981, p. 22). Her special position as compared with other civilizations was also expressed through monogamy, which became widely established, at the latest, with the progress of Christianity.

Over the course of the Middle Ages women acquired growing importance. In the aristocracy they were often the vehicles of education and science. Frequently they interfered into political affairs: Eleanor of Aquitany as an example. Their status in European society is also evident from the fact that in the context of the Christian Church they were able to form female religious orders possessing the same rights as male monastic orders. Their abbesses hat to fulfil the function of manorial landlords. Sometimes they
attained a prominent position in becoming accepted discussion partners of leading secular and ecclesiastical officials, as for instance Hildegard von Bingen or Catherine of Siena. But it was also possible that women led a life of religious discipline alone in the city. The mystic Agnes Blannbekin is recorded in the early 14th century in Vienna, where she led a solitary existence although in constant (and critical) contact with the outside world (Oppl, 1998, p. 162).

Women also played an important role in production. In all cultures they had to perform (heavy) work, in many cases as the main workers. In European agriculture, however, this was done in co-operation with the husband or the head of the family, performing specifically assigned functions to suit their particular capabilities: According to Mitterauer it can be said, that in the case of Central European peasant farming, as a rough simplification, that field, meadow and forest were primarily assigned to the man's work sphere. In the barn he had to care for the draught animals, i.e. horses and oxen, with which he also did the pulling work. Other typical areas of the man's work were building and repair tasks on the house, work buildings, roads and fences and the making of tools. The woman's province included the stall-rearing of cows, young cattle and pigs, milking, small-animal rearing, gardening and the associated types of plant-growing such as herbs, poppies, root vegetables or flax. The further processing of flax, including spinning, leads on to household management. In addition to making clothes, the tasks here notably include the production of foodstuffs, i.e. baking, dairy processing of milk, preserving meat, fruit and vegetables, etc. In addition, there are then domestic activities in the modern sense, such as cooking, laundering and – always central among women's tasks – caring for the children (Mitterauer, 1992, p. 30).

In general, it can be said that men tended to be allocated tasks which entailed working farther away from the house, involved greater risk and demanded more physical strength. The male preserve also included protecting the family and acting on its behalf with respect to the "outside world".

It is notable that the master/servant form of employment during youth, i.e. gainful activity outside the home performed in various households, was as typical for girls as it was for boys. The individualizing tendencies which accompanied this, together with securing an income of their own, gave women a relatively independent position. They became free to make their own choice of husband and also acquired a stronger position with respect to him in terms of property rights.

But of special relevance is the position of women in the European town. In the case of urban craft trades during the early Middle Ages there was no such close interconnection in the production process. But in the course of the time the position of women became ever more important. This was not only evidenced by the fact that if a craftsman died his widow was able to carry on running the business, but by women becoming themselves masters of – predominantly textile – crafts and even bosses of guilds. Beyond it, some of them were able to establish own trades with a variety of goods – at least in Cologne (Ennen, 1999, p. 133). With this development also the legal status of women improved considerably. Towards the end of the Middle Ages their position distinguished itself hardly of the male one.

Basically the towns provided ample possibilities for women to work on their own account. They could perform wage labor in households as servants, laundry women, nurses and sewers. It was the variety of this labor demand, which induced a significant female migration into the towns (Mitterauer, 1992, p. 277).
Towards the Early Modern Times deteriorated women's professional position. This might have been partly a consequence of economic changes. Handicraft lost importance and unemployed journeymen mobilized against female competition. Even more important seemed to be the educational development: the sons of the bourgeoisie were sent more and more to the universities. This was not the case with girls. On the one hand they were expected to marry, which implied a dowry, on the other hand, students were regarded as rascals, whom no girl could be exposed. The new academic jobs, as administrators, doctors and lawyers remained closed for women. So a split development took place.

Although women lost their position as qualified labor in towns, they gained now importance as untrained cheap labor. In manufacturing and commerce in Lower Austria for example women represented during proto-industrialization around two thirds of all employees in manufacture (Otruba, 1960, p. 171). And with the advent of industrialization proper this development continued particularly in the textiles. Work as an employee was poorly paid, since the general perception was that women's work constitutes only a supplementary source of income for the family (Mesch, 1984, p. 249). It must, of course, be remembered that it was only the legally relatively independent position of a woman in Europe which enabled her to engage at all in paid work outside the home. In other cultures (particularly Islam) the professional activity of women outside the home seems to have become customary only in more recent times.

The other trait of development pointed into the sphere of culture. With the Renaissance the bourgeoisie of the towns always less understood its life stile as contrary to the aristocracy, but started to imitate it. This had of course consequences for the position of the spouses. Up to the 19th century political affairs as well as secondary and academic education remained the prerogative of men. In the upper middle classes there was a new division of functions to the extent that the married woman dropped out of the production and earning process. She now concentrated more on running the household and bringing up the children, but within this context assumed more and more social functions. She not only took charge of maintaining important social contacts for her husband, but also developed many general cultural and political activities. The era of the "Salon" had arrived. This included more and more activities in arts. The time of writers began with, for instance, George Sand in France, Rahel von Varnhagen in Germany and Caroline Pichler in Austria.

3.2. The Impact of Women on Industrialization

Did the specific status of European women have any consequences for the process of Industrialization? First of all there is a so to speak technical and static effect. The social position of European women allowed a comparatively high participation rate. Of course in agriculture there arose no significant differences to other cultures. But even the institution of master service allowed a better utilization of labor capacity.

A far stronger effect must have been gained in towns. The great variety of jobs provided many possibilities to work not only for female inhabitants but also for the surrounding regions, which fostered migration – the latter also leading to a better utilization of the labor force.

On the other hand the status of European women had, as has been pointed out, removed any barriers
against gainful work outside the home. This effect became even more important with the advent of the Manufacturing system and later on with Capitalist Industry. In both cases entrepreneurs could dispose of a huge amount of female labor, which was already used to work outside home. And both of them relied in certain branches to an overwhelming degree on female labor. In the wake of Industrialization almost all young unmarried women outside agriculture were engaged in some gainful work outside the home. So all that meant ceteris paribus a higher gross domestic product per capita of the population.

In the same direction worked the fact, that handicrafts as well as traders were assisted by their spouses in their work. First by running the household also for all workers, later on by direct cooperation with their husbands in their respective trade. Additionally it may be remarked, that monogamy in these layers reduced private consumption in favor of saving and investment.

Represented the latter fact already a dynamic aspect, this is far more true for the female contribution in forming the individualistic and entrepreneurial type of men, who became the carrier of Industrialization. First of all it was the comparatively high educational standard – also of women – in town, which determined the qualification of labor; for well-educated mothers pass on their knowledge to the children and hence improve their learning capacities.

From the foregoing it becomes evident, that one driving force of the European development was the permanent scientific and commercial discourse. Its efficiency depended also on the volume of participation. The more people were involved, the stronger was its influence on the society. As long as the scientific discussion remained limited to a narrow part of population, it caused a limited effect on the institutional structure, but when it became popular it changed the latter.

In this light the participation of women in education and the scientific discourse of the Middle Ages must be seen. In the early periods women were frequently the carriers of education and knowledge in aristocratic families. Later on the female religious orders provided outstanding participants in the intellectual debate. Where there existed a close cooperation between husbands and their wives in handicraft enterprises and trade firms, this discourse took place within the family. And this process reached his climax during the Industrial Revolution in Britain. When has been said, that it was the technical and commercial discourse which was one of the main elements of Britain's extraordinary position, it should be borne in mind, that women were active participants in this debates (Jacob, 1998, p. 70).

And even in Early Modern Times up to the middle of the 19th century, when secondary and academic education remained the prerogative of men and in the upper middle classes married women dropped out of the production and earning process, women provided relevant contributions to the cultural discourse: intellectuals of this time met in the "Salons" of famous ladies.

3.3. The Capitalist Model of Female Employment

And the contribution of women to economic growth intensified during industrialization proper. The leading branches of Industrial Revolution were textiles and iron. The importance of the former can be grasped not
only by the fact, that most of the first industrial technical innovations were implemented in this branch, but by its explosive growth. 1770 cotton industry hardly contributed to the British gross domestic product. Around the turn of the century output was tenfold, but by the middle of the 19th century it had increased to hundredfold (Pollard, 1989, p. 52). The decisive point in this development was the fact, that the enormous employment expansion concerned predominantly females. Men seemed on the one hand to be less able to perform this task – they lacked "swift fingers" – on the other they were too expensive. As already said, female jobs were regarded as supplementary income and wages remained comparatively low. But may it be as it had been, the growth of this industry was only possible, because such an amount of at least fundamentally educated, well disciplined labor was at hand – also in so far as work outside the house caused no problem for women. In this way the given demand as well as the technical possibilities could be exploited.

But out of this constellation another growth effect arose. This had been depicted by Lewis as "Economic Development with Unlimited Supplies of Labor". According to this model the transfer of female labor from agriculture with marginal product of zero provides a considerable positive structural effect, which is reinforced moreover by the low wages. This will entail high profits, which foster investments. (Lewis, 1954). And this explanation loose little persuasive power, if marginal product in agriculture is higher than zero, because productivity there will be anyway surpassed by industry.

Up to now, the contribution of European women to the economic development, which finally flew into Industrial Revolution, has been assessed. But did this development also cause repercussions for the social status of women? To examine this seems especially important, because since Boserup's book on "Woman's Role in Economic Development" (1970) there is unanimity among feminist economists, that capitalist economic growth does not provide automatically improvements for the economic and social status of women. On the contrary: in the Third World countries the increase of agricultural production resulted in additional labor stress for female family members with no access to increased household income (Boserup, 1970, p. 81; Palmer, 1977). According to these authors it therefore depends only on political action to grant women the fruits of economic progress, although it seems to them debatable, whether real improvement is possible in the Capitalist system at all (Beneria – Sen, 1982, p. 160). Implicitly and, in the latter case explicitly, it is assumed, that there is no automatic improvement of women's position as a consequence of capitalist development.

The historical analysis seems to contradict this statement, because the above described development caused distinct repercussions for the social status of women. Industrial employment meant in spite of low wages more independence. This had been very limited in domestic service, which was the main profession for girls in town; and it developed in spite of the fact, that at first women worked predominantly as young females up to their marriage. They had gained an accepted position at the capitalist labor market.

From textiles and garments, female employment spread more and more to other branches. In industry first to shoe and leather, but gradually into other branches of consumer industry and – with lesser shares – also into all other industries, except mining. From industrial employment female labor spread via catering and modern retail trade generally into services, which were to become the dominant sector of
female employment.

Of course this development was also possible because of a basic educational level of women, but certainly the female employment in industry provided a strong incentive for institutional changes, which improved the social and with it the educational status of women in the developed capitalist countries. All this found its expression in an steadily growing share of women in total employment. Besides this permanently growing utilization of the labor force meant also ceteris paribus higher per capita growth.

And nearly the identical process can be observed even more pronounced in the catching-up process of Third World countries, because of the less favorable social status of women than in Europe. This is especially the case in the East Asian region. In Singapore for example female employment expanded in textiles, garments and electronics. Between 1957 and 1979 the employment rate of women increased from 21.6 percent to 41.9 percent, its share in total employment from 17.3 percent to 33.6 percent.

This entailed a bulk of social consequences: marriages became now a matter of individual choice, the age of marriage increased, the young couples formed independent households, small families with two or three children became the norm. Husband-and-wife relationships were identified as the companionship type. Therefore the rate of fertility decreased from 2.3 percent in 1966 to 1.2 percent in 1979. And in 1978 women constituted 47.1 percent of the primary school enrolment, 51.6 percent of the secondary and 43.0 percent of the university enrolment (Wong, 1981).

Foreign direct investment played a crucial role in this development because the majority of labor intensive industries were of multinational origin. It were these companies, which frequently set in motion the historical capitalist mechanism with its consequences for female employment and status: “…the expansion of employment opportunities for women in these industries does improve conditions for women in the labor market. In however limited way, the availability of jobs in multinational and local export factories does allow women to leave the confines of home, delay marriage and childbearing, increase their incomes and consumption levels, improve mobility, expand individual choice, and exercise personal independence. Working for a local or foreign factories for many women at least marginally preferable to the alternative of staying at home, early marriage and childbearing, farm or construction labor, domestic service, prostitution, or unemployment, to which they were previously restricted. Factory work, despite the social, economic and physical costs it often entails, provides women in developing countries which one of the very few channels they have of at least partial liberation from the confines and dictates of traditional patriarchal social relations” (Lim, 1983, p. 83)

Other monographs show similar developments throughout many parts of the Third World, as for instance in Mauritius (Hein, 1986), in South America (Arriagada, 1994), especially in the "Maquiladora" region of Mexico (Pearson, 1991) or in Turkey (Moghadam, 2000, p. 38). And in many of these countries the ensuing spread of female employment into other branches, especially into modern services like banking, insurance, legal services, health care or tourism took place.
Table 2: Female Share of Labor Force in Selected Countries

As percent of total labor force

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<td>36.3</td>
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<td>24.4</td>
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Source: The World Bank, World Development Indicators.
An overview of the world development shows, that from the sixties nearly in all regions the share of female employment increased, but the level still differs significantly. In 2000 it is highest in the most developed Western countries, it is approaching half of the labor force. This is also true for the former Socialist countries. In the East Asian region the share centers more around 40 percent. In South America the level is distinctly lower and moves a little higher than 30 percent. The Arabian countries and Iran still fall short of this figure, with wide regional differences. The very high level of the African countries seems to represent a statistical phenomenon; in view of the high share of agricultural production all women are included into the labor force.

So it seems, that the level of economic development is an important determinant of female labor force participation. The successfully catching-up countries of South Eastern Asia are passing the 40-percent-benchmark. South America with its ambivalent performance remains within the 30-percent-brackets, whereas the dragging Arabian countries remain below this level. The enormous differences among them seem to represent the consequence of the existing governance structure. The still very strong influence of Muslim religion in general and its treatment of women especially limits the supply of female labor.

4. Summary and Conclusions

The preceding article tried to answer the question, whether women exerted a specific impact on industrial development. The basis of these deliberations was the neoinstitutionalist approach, which grasps the process of Industrial Revolution especially as well as any industrialization generally as a long lasting development of institutional change, the former needing centuries, but also catching up lasting many decades. The growth of the adequate governance structure for taking-off was determined by elements, which distinguished Europe from other cultures.

It started with the individualization of the European citizen and the establishment of the rule of law in Antiquity, continued with the development of the free cities, where burghers intensified those beginnings, where commercial activities not only expanded, coordinated by the market, but where entrepreneurs tried new combinations of the factors of production to minimize costs, already utilizing technical progress. In Early Modern Times the political and administrative frame for the future development was constructed, but with the era of Enlightenment the “scientific revolution” took place which shaped the basis for permanent technical progress. And finally towards the end of the 18th century the great breakthrough established the capitalist society.

One element, which differed also considerably from the extra-European cultures was the social and economic position of women. So there arose the question, whether there from existed influences upon the capitalistic development and which element of this process might have been concerned. On the other hand the recent discussion of feminist economists deals frequently with the problem, which repercussions the capitalist development exerts upon the status of women in society. This is examined also in the Third World context.

The foregoing analysis demonstrated, that the comparatively strong and independent position of
European women, which found its expression not only in the specific family status, but also in religious life through female orders, brought an early intensive involvement into handicraft production of husbands, but later on also as independent producers, which led to specific female guilds and independent trading. This provided a better utilization of the total labor force as well as a higher productivity of handicrafts. The strong position of women, as well as the considerable labor demand in European towns induced an extensive migration of girls from the countryside into cities.

This favorable female position in production was lost towards the Early Modern Times with the reduction of the importance for handicraft production and with the exclusion of higher education for girls. On the other hand, women gained increased importance for the putting out system and manufactures in proto-industrialization. The presence of a huge fundamentally educated female labor force made possible the dynamic growth of textile industry, one of the two leading sectors of industrialization proper.

The migration of female labor from agriculture with a marginal product tending towards zero into industry provided a considerable structural growth effect. The comparatively low wages caused high profits for the capitalists, which fostered investment, as has been explained by Lewis.

Another factor which favored economic growth can be seen in the comparatively high educational standard of European women, which provided a basically well qualified labor force. But equally important seems the fact, that well-educated women bring up well-educated children. And on a higher level women participated in the intellectual and technical discourse, which fostered the institutional background, that became fundamental for the industrial society.

The analysis of female employment during the Industrial Revolution and catching-up processes in several parts of the world revealed remarkable similarities. In every case the process of industrial production started to a considerable degree with low wage industries. Textiles and garments were in the catching up areas supplemented by electronics. The successful development of all those industries was fostered by the availability of female labor force ready for operation. From these branches production spread into other more demanding branches.

The same can be said from female employment. It starts also in these low-wage industries and spreads gradually into other industries, but primarily into modern services. Women become an established part of the capitalist labor market. Especially from the studies into Third World countries it can be grasped, that the expansion of female industrial employment entailed radical changes in the social status of women. Because it was less developed in these regions, than in Europe at the beginning of the 19th century, the changes were even more obvious. Of course these changes were fostered also by prior institutional and organizational alterations, especially by education. But it seems, that the labor market position of women alleviates this development.

So it may be finally said, that the specific social position of European women fostered industrial development as well as the capitalist model of female employment not only accelerated and accelerates economic growth, but automatically improves the economic and social status of women.
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